Sl.No. 1588 SUBJECT CODE: 34712606

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
ELECTRICAL AND ELECTRONICS ENGINEERING
SIXTH SEMESTER
MICROPROCESSORS AND MICROCONTROLLERS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define Microprocessor. Mention the clock frequency of 8085.
2 Mention the basic concepts in the memory interfacing.
3 What is synchronous data transfer?
4 What are the modes used in keyboard modes?
5 What are the various interrupts in 8086?
6 What is the function of BIU?
7 Write a program using 8051 assembly language to change the data 55H stored in the lower byte of the data pointer register to AAH using rotate instruction.
8 List the features of 8051 microcontroller.
9 What is Key bouncing?
10 Draw the diagram of successive approximation ADC.

PART-B (5 x 16 = 80)

11 a. Elaborate the data transfer instruction set of 8085 with example.

OR

b. Describe in detail about the special features of 8085 µp compared with generic µp.

12 a. Draw the architecture of IC 8255 and explain its function.

OR

b. Explain in details the function of DMA Controller 8257.

13 a. Draw and explain a block diagram showing 8086 in maximum mode configuration.

OR

b. Describe the logical and branching instruction set of 8086 with example.

14 a. Write detail notes on instruction set of MC 8051 with examples.

OR

b. Write an assembly language program for two 8 bit addition and multiplication in 8051.

15 a. Explain in details of Microcomputer based scale operation with neat diagram.

OR

b. Describe about DAC interfacing with an example.

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Sl.No. 1586 SUBJECT CODE: 34712403

VINAYAKA MISSIONS RESEARCH FOUNDATION

(Deemed to be University)

B.E-DEGREE EXAMINATIONS- FEB - 2022

ELECTRICAL AND ELECTRONICS ENGINEERING

FOURTH SEMESTER

ELECTRONIC CIRCUITS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define rectifiers.

2 Define choke.

3 What is thermal runway?

4 What is the need for biasing?

5 Define Transformer coupling.

6 What is meant by harmonic distortion or non linear distortion?

7 Give classification of amplifiers.

8 State the Barkhausen criterion.

9 Define unloaded and loaded Q of tuned circuit.

10 Mention the advantages of emitter coupled Astable Multivibrator.

PART-B (5 x 16 = 80)

11 a. Discuss the Operation of capacitor input filter with circuit diagram.

OR

b. What is a regulator? Explain its types.

12 a. Explain voltage divider biasing and derive the expression for its stability factor.

OR

b. Analyze the transistor amplifier circuit using h-parameters.

13 a. Describe the operation of Class A power amplifier with circuit diagram.

OR

b. Discuss Complementary symmetry Class B amplifier with circuit diagram.

14 a. Explain with relevant information how the negative feedback amplifier improves stability, reduces noise and increases input impedance.

OR

b. Explain the working of Hartley oscillator with circuit diagram. Also derive the expression for frequency of oscillation.

15 a. Draw and Explain class C tuned amplifier and derive its efficiency.

OR

b. Draw the circuit diagram of Complementary transistor Monostable Multivibrator and explain its operation.

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S.No.1587 **SUBJECT CODE: 38212702**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB- 2022
COMPUTER SCIENCE AND ENGINEERING
SEVENTH SEMESTER
ENGINEERING MANAGEMENT AND ETHICS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 List the various kinds of standing plans.
2 Define the term mission. Give an example for mission statement of your own.
3 Give a note on matrix Organisation.
4 Define the term staffing.
5 Write a key note on Communication.
6 Differentiate between formal and informal communication.
7 Define the term ethics.
8 Codes of ethics – Explain.
9 Give a note on gift and bribe.
10 List out some most common conflicts that may arise for an engineering project manager.

PART-B (5 x 16 = 80)

11 a. (i) Differentiate between policies and strategies. (ii) Differentiate between policies and procedures.

OR

b. Discuss the advantages and limitations of MBO.

12 a. Explain the process of delegation, and the guidelines for effective delegation.

OR

b. Distinguish between line and staff authority.

13 a. Describe the Maslow's need hierarchy theory with diagram.

OR

b. Discuss in detail on usage of electronic media in communication.

14 a. "Engineers as responsible experimenters" – Discuss.

OR

b. Discuss the different roles and functions of codes of ethics. In what ways the engineering societies can promote ethics?

15 a. Write a detailed essay on occupational crimes.

OR

b. Discuss on Engineer's involvement in weapon's development and analyse the problems faced by the defense industry.

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Sl.No. 1585 SUBJECT CODE: 38212802

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
EIGHTH SEMESTER
ELECTIVE: TOTAL QUALITY MANAGEMENT

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Quality planning – Explain its any four importance.

2 List the importance of quality council in an organization.

3 Mention the five important principle of TQM.

4 Define the term “partnering”.

5 Give the examples for vital few and Revival many in Pareto diagram.

6 Write down the difference between defect and defectives.

7 Why site visits are necessary in a benchmarking process?

8 Mention the essential requirements of TPM.

9 Write short notes on environmental effect.

10 Differentiate between ISO 14000 and ISO 9000 series of quality system.

PART-B (5 x 16 = 80)

11 a. Enlighten the habits of successful people according to Stephen covey.

OR

b. Describe the barriers for implementing TQM in industries.

12 a. Describe the Juran Trilogy in detail with diagram.

OR

b. Discuss the important elements to achieve customer/supplier partnering relationship.

13 a. Write notes on:
(a).Differentiate matrix diagram and matrix data analysis diagram. (8 Marks)
(b) Differentiate tree diagram and decision tree diagram. (8 Marks)

OR

b. Describe in detail the steps involved in six sigma process. And also discuss the advantages of six sigma.

14 a. Discuss in detail the quality function development with suitable diagram.

OR

P.T.O

b. a) The specifications of a particular product are 25 ± 3 and the average repair cost is Rs.90. Determine the quality loss function and the loss when X = 23

b) A product has a constant failure rate of 0.018 per hour. What is the probability that the product will survive or be reliable during the first 120 hours of operations

15 a. Explain the various stages of quality auditing.

OR

b. Discuss in detail the benefits of ISO 14000.

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Sl.No. 1584 SUBJECT CODE: 34712509

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
ELECTRICAL AND ELECTRONICS ENGINEERING
FIFTH SEMESTER
EMBEDDED SYSTEMS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Mention the requirement of embedded system.
2 List the concept used during a design process.
3 What is I²C bus?
4 State the timer.
5 List out the advantages of high level language.
6 Define NULL pointers.
7 Define Assembler.
8 List out the function of BDM.
9 Mention the parameter of context_init.
10 Determine the use of RTOS in Embedded System.

PART-B (5 x 16 = 80)

11 a. Write short note on:
I) Software Tools for Designing an Embedded System
II) Software for Device Driver and Device Management in an Operating System

OR

b. Discuss the Hardware and Software Components in a Digital Camera.

12 a. Explain the Parallel I/O, Bidirectional Device Ports with a neat diagram.

OR

b. Explain the CAN Bus involved in serial data communication with a neat diagram.

13 a. Write short notes on the program Elements:
i) Data types and pointers with example ii) Queue

OR

b. Write short note on:
i) Object oriented programming ii)Optimization of codes in embedded C++ program.

14 a. Describe the Object Oriented Interfacing.

OR

b. Illustrate on Integrated Development Environment.

15 a. Discuss about Timer Function with an example.

OR

b. Elaborate the process management and memory management in the embedded system.

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Sl.No.1582 **Sub. Code: 35016301**

VINAYAKA MISSIONS RESEARCH FOUNDATION
B.E. DEGREE EXAMINATION – FEB – 2022

COMPUTER SCIENCE AND ENGINEERING
Third Semester

SOFTWARE ENGINEERING
(Candidates admitted under 2016 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. What are the characteristics of the software?
2. Define software prototyping.
3. Define software metrics.
4. What is refinement?
5. Define coupling.
6. What are the various elements of data design?
7. What is cyclomatic complexity?
8. What are the measures of software reliability?
9. Write down the importance of software configuration audit.
10. What is status reporting?

PART-B (5 x 16 = 80 Marks)

11.a) With a neat diagram explain about waterfall life cycle model.

OR

b) Briefly discuss about prototyping model with a neat diagram..

12.a) Explain the different cost estimation techniques.

OR

b) Discuss in detail about Requirement Engineering process.

13.a) Write a notes on the following: (i) Data flow diagram (ii) Entity / Relationship diagram.

OR

b) List out the types of architectural design style.

14.a) Write short notes on SQA activities with suitable example.

OR

b) Briefly explain about software reviews and it’s importance.

15.a) Explain about major SCM task and it’s important.

OR

b) Explain about software documentation and rules for sound documentation.

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Sl.No. 1583 SUBJECT CODE: 35012802

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
EIGHTH SEMESTER
ELECTIVE -SOFTWARE QUALITY MANAGEMENT

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Give the definitions of quality.

2 How the quality criteria interrelate?

3 What is SQA Plan?

4 What is auditing?

5 What are the Ishikawa's basic tools in software development?

6 Define predictive validity.

7 What is statistical process control?

8 Write down the general formula to calculate the cyclomatic complexity.

9 List out the ISO 9000 series of quality management standards.

10 Write a note on Project management.

PART-B (5 x 16 = 80)

11 a. Write a note on Boehm model.

OR

b. Write in detail GQM model.

12 a. Describe in detail about technical review process.

OR

b. Explain walkthrough process and audit process.

13 a. Explain the Defect removal Effectiveness.

OR

b. Explain in detail about basic quality tools in software development.

14 a. Write a note on complexity metrics and its models.

OR

b. Briefly explain structure metrics.

15 a. Explain in detail the CMM Model

OR

b. Explain the Six Sigma Concepts.

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Sl.No. 1581 SUBJECT CODE: 34612806

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
ELECTRICAL AND ELECTRONICS ENGINEERING
EIGHTH SEMESTER
Elective -FLEXIBLE AC TRANSMISSION SYSTEMS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Why there is a need of interconnection in electrical power systems ?
2 What are the types of FACTS controllers?
3 What are the advantage of SVC?
4 How the SVC is employed for prevention of voltage instability?
5 Define vernier control mode operation of TCSC.
6 What are the two variants to be obtained during operation of TCSC?
7 What are the basic techniques used for reducing harmonics in STATCOM converter output voltage?
8 What is the function of shunt converter and series converter in UPFC?
9 What is the roll of Fast controls associated with FACTS controllers?
10 Define Linear Quadratic Regulator (LQR).

PART-B (5 x 16 = 80)

11 a. What are the basic types of facts controllers explain in short.

OR

b. Write a short note on i) UPFC ii) SVC

12 a. Briefly describe the way by which the transient stability is enhanced due to static var compensator.

OR

b. Explain the design of SVC voltage regulator in detail.

13 a. Explain the principle of operation of TCSC with relevant schematic.

OR

b. Explain the variable reactance model of TCSC with neat sketch.

14 a. Explain the application of STATCOM briefly.

OR

b. Describe the load flow model of UPFC for power flow studies.

15 a. Investigate the SVC-SVC controller interaction in a large power system.

OR

b. Explain in detail about the coordinated tuning of power system damping controllers using generic algorithm.

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Sl.No. 1579 SUBJECT CODE: 35015403

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
FOURTH SEMESTER
JAVA PROGRAMMING

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 How is Java more secured than other languages?

2 Mention the role of Polymorphism in Java.

3 Elucidate on the concept of Inheritance.

4 How will you initialize an array?

5 List out the methods under reflection used to analyze the capabilities of classes?

6 Give short notes on Dynamic proxy.

7 Why Errors are not checked in Java?

8 Differentiate between the 'Font' and 'FontMetrics' class.

9 Mention the different states of a thread.

10 What does the Serializable interface do?

PART-B (5 x 16 = 80)

11 a. With an example code, explain Constructors.

OR

b. With an example describe abstract classes and Differentiate between abstract and concrete classes.

12 a. Explain Arrays in Java with an example.

OR

b. Write a program to a) Compare two strings b) How to search a word inside a string?

13 a. What is object cloning? Explain deep copy and shallow copy with examples.

OR

b. What is proxy class? Develop a Java code for constructing a proxy object.

14 a. How are mouse events generated? Elaborate with sample codes.

OR

b. Explain about layout management available in Java.

15 a. Write a Java program to create and implement threading by implementing the Runnable interface.

OR

b. What is meant by Executors? Explain in detail.

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Sl.No. 1580 SUBJECT CODE: 34112401

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMMON TO EEE,MECH
FOURTH SEMESTER
NUMERICAL METHODS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Name two direct methods to solve a system of algebraic equations.

2 Compare Gauss Seidel and Gauss-Jacobi Iterative methods?

3 What is the error involved in *Newton's* Interpolation formula.

4 State Inverse Lagrange's Interpolation Formula.

5 State *Newton's backward interpolation formula* to Find $\frac{dy}{dx}$ and $\frac{d^2y}{dx^2}$ at $x = x_n$

6 A curve is passing through the points $(1,2),(2,1)$ and $(4,5)$. Find the slope of the curve at $x = 3$

7 State which is better. *Taylor's series* method or *Runge-Kutta method* . Justify

8 Write the solution of the governing equation $\frac{d^2x}{dt^2} = -\mu^2 x$ of Simple harmonic motion

9 Write the finite difference scheme using forward difference in time and central difference in the -direction for the one dimensional heat flow equation.

10 Define boundary value problem.

PART-B (5 x 16 = 80)

11 a. Evaluate $\sqrt{12}$ to four decimal places by *Newton - Raphson* method

OR

b. Find the inverse of a matrix $\begin{bmatrix} 2 & 1 & 1 \\ 3 & 2 & 3 \\ 1 & 4 & 9 \end{bmatrix}$ by *Gauss Jordan* method.

12 a. Using *Newton's Forward Interpolation Formula,* Find the value of $\sin 47^\circ$ given that

$\sin 45^\circ = 0.7071,\ \sin 50^\circ = 0.7660,\ \sin 55^\circ = 0.8192,$ and $\sin 60^\circ = 0.8660.$

OR

b. Apply Lagrange's formula to find $f(5)$, given that $f(1)=2$, $f(2)=4$, $f(3)=8$ and $f(7)=128$.

13 a. Find the first two derivatives of y at $x=54$ from the following data.

x	50	51	52	53	54
y	3.6840	3.7084	3.7325	3.7563	3.7798

OR

b. Evaluate $\int_0^1 \frac{\sin x}{x}\,dx$, by a *Gaussian* three – point quadrature formula.

14 a. Using the *Runge-Kutta method*, tabulate the solution of the system $\frac{dy}{dx}=x+z$, $\frac{dz}{dx}=x-y$, $y(0)=0$, $z(0)=1$, $h=0.1$. Find $y(0.1)$, $y(0.2)$, $z(0.1)$ and $z(0.2)$.

OR

b. Solve $\frac{d^2y}{dx^2}-x\left(\frac{dy}{dx}\right)^2+y^2=0$ using *Runge-Kutta method* for $x=0.2$ correct to 4 decimal places. Initial conditions are $x=0$, $y=1$, and $y'=0$.

15 a. Solve $xy''+y=0$, $y'(1)=0$ and $y(2)=1$ with $h=0.5$

OR

b. Solve the Poisson equation $\nabla^2 u=-81xy$, $0<x<1$; $0<y<1$ and $u(0,y)=u(x,0)=0; u(x,1)=u(1,y)=100$ with the square mesh of size $h=\frac{1}{3}$.

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Sl.No. 1578 **Sub. Code: 34615101/34616101**

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.E. DEGREE EXAMINATION - FEB – 2022

COMMON TO AUTO, CIVL & MECH

First Semester

ESSENTIALS OF ELECTRICAL AND ELECTRONICS ENGINEERS

(Candidates admitted under 2015&2016 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

Use separate Answer books for Part I and Part II

PART – I: ELECTRICAL ENGINEERING (50 marks)

PART – A (10 x 2 = 20 Marks)

1. What is Electric Resistance?
2. Mention the SI unit of Area, Volume and Force.
3. Describe Power Factor.
4. What is a DC Motor?
5. Write any two Applications of DC Motors.
6. What is a Commutator?
7. Define Transformer.
8. Write the Working principle of Single Phase Induction Motor.
9. Explain the Step up and Step down Transformer.
10. How Ideal transformers differ from the practical Transformer?

PART – B (3 x 10 =30 Marks)

1 . a) Explain the Construction and principle of operation of moving coil Instrument with neat diagram.

OR

b) Derive the equation of Average value and RMS value of Sinusoidal Waveforms.

2. a) With neat diagram explain the Working Principle of a DC Generator.

OR

b) Explain the working principle of Three Point DC Starter.

3. a) Enumerate the types of Three Phase transformer connections with suitable diagrams.

OR

b) Distinguish between Synchronous Motor and Three Phase Induction Motor.

(P.T.O)

PART – II: ELECTRONIC ENGINEERING (50 marks)

PART – A (10 x 2 = 20 Marks)

1. Define Passive components.

2. List the classifications of resistors.

3. Compare N-type and P- type Semiconductors.

4. Which configuration of BJT is widely used? Why?

5. Find the 2s complement of the binary number 1011001.

6. Give the truth table of a 2-input XOR gate.

7. Give the truth table of a full adder.

8. Define MODEM.

9. List the most common storage techniques in Video Games.

10. Distinguish between AM and FM.

PART – B (3 x 10 =30 Marks)

11. a) Elaborate the formation of PN junction and its working under No Bias, Forward Bias & Reverse Bias condition. Plot its V-I characteristics curve.

OR

b) Compare CB, CE & CC configurations of BJT with necessary diagram.

12. a) Explain any four logic gates with truth table and symbol.

OR

b) Design and explain the working of 4: 1 and 8: 1Multiplexer with a neat diagram.

13 a) Discuss about High Definition TV with diagram.

OR

b) Elucidate on Satellite Communication system with diagram.

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Sl.No. 1577 SUBJECT CODE: 35012801

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
EIGHTH SEMESTER
ELECTIVE - TCP/IP TECHNOLOGY

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Differentiate physical & logical addressing.
2 Give the purpose of the Internet layer in the TCP/IP protocol suite.
3 Differentiate Classful and Classless addressing.
4 Mention the purpose of subnetting and supernetting.
5 List out the types of ICMP packages.
6 Write the declaration for the control-block table.
7 What is meant by sliding window protocol?
8 Define MOSPF.
9 Write the difference between bind function and the listen function.
10 Give the importance of remote login.

PART-B (5 x 16 = 80)

11 a. Differentiate IPV4 and IPV6 addressing.

OR

b. Describe in detail about switched WANs and its examples.

12 a. Discuss in detail about the following
a).Direct Broadcast Address b).Loopback Address
c).Private Addresses d).Limited Broadcast Addresses

OR

b. Describe in detail about supernetting.

13 a. Explain in detail about checksum concept in IP.

OR

b. Discuss in detail about encapsulation of IGMP packet.

14 a. Describe in detail about silly window syndrome in TCP.

OR

b. Discuss in detail about TCP timers.

15 a. Discuss in detail about concurrency mode in client server model.

OR

b. Discuss in detail about socket system calls.

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Sl.No. 1576 SUBJECT CODE: 34612804

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
ELECTRICAL AND ELECTRONICS ENGINEERING
EIGHTH SEMESTER
Elective - SPECIAL ELECTRICAL MACHINES

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1	Mention the disadvantages of synchronous reluctance motor.
2	Give the expression for the torque of permanent magnet synchronous reluctance motor.
3	State micro stepping in stepper motor
4	What is the use of current suppression circuit?
5	What is switched reluctance motor?
6	Mention the types of control techniques in SRM.
7	Draw the magnetic equivalent circuit of two pole PMBLDC motor .
8	Compare PMBLDC and DC motor.
9	What are the assumptions made in derivation of emf equation for PMSM?
10	How are PMBLDC and PMSM different?

PART-B (5 x 16 = 80)

11 a.	Drive the voltage equation for synchronous reluctance motor.
	OR	
b.	A 3 – phase,400 V, 50Hz,4 – pole, star – connected synchronous reluctance motor, with negligible armature resistance, has Xsd = 8Ω and Xsq = 2Ω. For a load torque of 80 N-m, calculate (a) the load angle (b) the line current (c) the input power factor. Neglect rotational losses.
12 a.	Elucidate microprocessor control of stepper motor with necessary diagram.
	OR	
b.	Explain the construction and principle of operation of permanent magnet stepping motor.
13 a.	With neat sketch explain the importance of closed loop control in SRM.
	OR	
b.	Derive the expression for torque development in SRM
14 a.	Write short notes on (i) Classification of PMBL DC Motor (ii) Compare electronic and mechanical commutator
	OR	
b.	Describe the sensor less control of BLDC motors with neat sketch.
15 a.	Explicate the emf equation of permanent magnet synchronous motor.
	OR	
b.	Write short notes on (i) Axial flux motor (ii) Radial flux motor

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Sl.No. 1575 SUBJECT CODE: 34712408

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- FEB - 2022
ELECTRICAL AND ELECTRONICS ENGINEERING
FOURTH SEMESTER
DIGITAL ELECTRONICS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Prove that the logical sum of all min terms of a Boolean function of 2 variables is 1.

2 Give the truth table and symbol of EX-N0R gate.

3 Define fan-in of a circuit.

4 State two advantages of CMOS logic

5 Draw the half adder circuit and give its truth table.

6 In what way the PLA is advantageous over ROMs?

7 Define shift register.

8 Compare and contrast static RAM and dynamic RAM.

9 What are the causes of Hazards.

10 What is EEPROM, EPROM?

PART-B (5 x 16 = 80)

11 a. Simplify the following expression using K-map technique and obtain
i) minimal SOP and & ii)minimal POS expression.
$Y=\sum m(0,2,3,6,7)+\sum d(8,10,11,15)$

OR

b. Simplify the following Boolean function by Quine Mc Clusky method and verify with k map.
$F(A,B,C,D)=\sum m(2,3,5,7,9,11,12,13,14,15)$.

12 a. Draw the circuit diagram for a two- input ECL OR gate and explain its operation.

OR

b. Draw the circuit diagrams of 2 input CMOS NOR gate and CMOS NAND gate using CMOS logic and explain their operation.

13 a. i).Design a full adder and explain its operation.
ii).Design a combinational circuit that will convert a straight BCD digit to an excess BCD digit.

OR

b. Design a logic circuit to convert the BCD code to Excess-3 code.

14 a. Design and implement a decade synchronous counter using T flip flops.

OR

b. Explain the Master/Slave JK flip flop with neat diagram.

15 a. Explain about races and cycles with examples.

OR

b. An Asynchronous sequential circuit is described by the following excitation and output function.

$Y=X_1 X2 +(X1+X_2) Y$ $Z=Y$

i) Draw the logic diagram of the circuit.

ii) Derive the transition table and output map.

iii) Describe the behavior of the circuit

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Sl.No. 1574 SUBJECT CODE: 34415802

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E -DEGREE EXAMINATIONS - FEB-2022
MECHANICAL ENGINEERING
EIGHTH SEMESTER
ELECTIVE ADVANCED I.C ENGINES

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What is meant by Stoichiometric air-fuel ratio?

2 What is electronically controlled fuel metering?

3 What is the purpose of a swirl in a Compression Ignition engine?

4 What is soot? How and when it occurs?

5 What is three-way catalytic converter?

6 Mention the pollution norms followed for automobiles in India.

7 Mention any two methods of methanol production from methane.

8 Discuss the suitability of CNG and LPG as SI and CI engine fuels.

9 Specify two models of automobiles using Gasoline Direct Injection (GDI)?

10 Differentiate between homogeneous and heterogeneous mixture.

PART-B (5 x 16 = 80)

11 a. Describe Electronic Fuel Injection System in a Spark Ignition Engine.

OR

b. Discuss the effects of engine variables on knock in a Spark Ignition Engine.

12 a. List the types of an Indirect – Injection chambers of a Compression Ignition engine with a neat sketch. Explain them.

OR

b. What is ignition delay period in a Compression Ignition engine? Explain the factors of ignition delay and the effects on combustion.

13 a. Describe the various methods of control for exhaust emission from petrol engines.

OR

b. How do you control evaporative emissions? Explain two such methods available.

14 a. Explain any one method by which Hydrogen can be used in CI engine.

OR

b. What are the advantages of Compressed Natural Gas (CNG) and Liquefied Petroleum Gas (LPG)?

15 a. Describe the Honda Compound Vertex Controlled Combustion (CVCC) engine and explain its advantage over other types of engines.

OR

b. Explain the merits of lean burn Engine over stratified charge engine in detail.

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Sl.No. 1571 SUBJECT CODE: 35015704

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
SEVENTH SEMESTER
SOFTWARE TESTING

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Illustrate the concept of failure.
2 Define Review.
3 Define Equivalence class partitioning.
4 Define Path.
5 What is Test harness?
6 What is Stress testing?
7 Define milestones.
8 Narrate the simple COCOMO equation.
9 What are the various Severity level hierarchy?
10 What are the various roles in review program?

PART-B (5 x 16 = 80)

11 a. Describe Origins of defects with neat diagram.

OR

b. Give details about Developer / Tester support for developing a defect repository.

12 a. Discuss about following techniques
a)Cause – and - Effect graphing b) State transition testing .

OR

b. What are the Types of white box testing and explain any two white box testing technique?

13 a. Explain about the class as testable unit.

OR

b. What are the key differences in integrating procedural-oriented systems as compared to object-oriented systems?

14 a. Give Details about Test Plan Attachments.

OR

b. Why is it so important to integrate testing activities into the software life cycle?

15 a. Narrate on the Types of reviews.

OR

b. What role do user/client play in the development of test plan for a project? Should they be present at any of the test plan reviews? Justify your answer.

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Sl.No. 1572 SUBJECT CODE: 35012706

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
SEVENTH SEMESTER
ELECTIVE: - SOFT COMPUTING

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What is hard computing?

2 Define following terminologies
a. Core b. Cross over

3 Explain mutation.

4 What are the basic steps involved in general simulated annealing?

5 How ANN (Artificial Neural Network) resembles brain?

6 Define Hebbian learning.

7 Write sigmoidal rule

8 State the other names of fuzzy inference system?

9 Expand ANFIS.

10 Write some fuzzy rules in color recipe prediction.

PART-B (5 x 16 = 80)

11 a. What is defuzzification and explain in detail .

OR

b. Explain in details about MAMDANI FUZZY MODELS

12 a. Describe descent methods.

OR

b. Briefly explain simulated annealing.

13 a. With a suitable example explain Backpropagation.

OR

b. Write briefly about Competitive Learning Networks.

14 a. Write short note on (A)ANFIS (B)CANFIS (C)RBFN (D) FUZZY SPECTRUM

OR

b. Explain Nero Fuzzy Spectrum.

15 a. Explain about automobile fuel efficiency.

OR

b. Discuss about
a) Color recipe prediction. b) Genetic strategies.

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Sl.No. 1570 SUBJECT CODE: 34612803

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
ELECTRICAL AND ELECTRONICS ENGINEERING
EIGHTH SEMESTER
ELECTIVE -POWER ELECTRONICS FOR RENEWABLE ENERGY SYSTEMS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What are the types of fuel cell?

2 What is meant by spring and neap tides?

3 Write the steady state equation of a PMSG.

4 State the principle of PMSG.

5 What are the factors to be considered for the selection of inverter and batteries for solar energy conversion?

6 What are the advantages of uncontrolled rectifier?

7 What is meant by fault ride through capability?

8 What are the demerits of grid integrated WECS?

9 Write the merits of wind-diesel hybrid system.

10 What is MPPT?

PART-B (5 x 16 = 80)

11 a. Describe the consequences of greenhouse effect.

OR

b. Describe the principle of generation of Bio gas and mention the factors affecting its generation.

12 a. Explain the principle of operation of DFIG used for renewable energy conversion.

OR

b. Draw the circuit model of PMSG and explain the methods used for steady state analysis.

13 a. Describe how a three phase line commutated converter is operated as an inverter.

OR

b. Describe working of AC-DC-AC converter with circuit and wave form for wind energy conversion.

14 a. Explain the operation of grid integrated PMSG system with a neat block diagram.

OR

b. Explain how the isolation and temperature affects the I-V characteristics of a solar cell.

15 a. Explain various strategies used for the operation of an MPPT.

OR

b. With a neat sketch, explain the operation of PV-Diesel hybrid system.

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Sl.No. 1573 SUBJECT CODE: 34415801

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E -DEGREE EXAMINATIONS - FEB-2022
MECHANICAL ENGINEERING
EIGHTH SEMESTER
ELECTIVE-EMERGING MATERIALS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What is the significance of wrought iron?

2 Write any two properties of nodular cast iron.

3 What is mean by mechanical alloying?

4 Define atomization?

5 What are wet winding?

6 What is meant by Nano-composite?

7 Where the shape memory alloys are applicable?

8 Where the quantum tunneling composite is used?

9 State any two subclasses of bulk nanomaterials.

10 State four specific superior properties of nanomaterials than the bulk substances.

PART-B (5 x 16 = 80)

11 a. Write about aluminum and its alloys and applications.

OR

b. Discuss in detail about the high temperature materials with example.

12 a. Describe the production of iron powder by any commercial method.

OR

b. Explain compacting process with an illustration.

13 a. What is meant by Composite? Explain its properties with first and second level classification?

OR

b. Discuss the engineering applications of composites.

14 a. Describe about NiTiNol and its application.

OR

b. Explain the martensitic Transformation of smart materials.

15 a. Explain bottom-up approach and top-down approach of synthesis of nanomaterials.

OR

b. Compare and contrast the Chemical Vapour Deposition and Atomic Layer Deposition processes.

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Sl.No. 1568 SUBJECT CODE: 35015404

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
FOURTH SEMESTER
OPERATING SYSTEMS

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define the term “co-operating processes”.

2 Give the multithreading models.

3 Define Pre-emptive scheduling.

4 When does a race condition occur?

5 Write some memory management functions.

6 What is TLB?

7 Give examples for file types.

8 What is the use of tree structured directories?

9 Give examples for disk scheduling algorithms.

10 How is the total capacity of the disk calculated?

PART-B (5 x 16 = 80)

11 a. Discuss in detail about the types of system calls with examples.

OR

b. Explain in detail about the threading issues.

12 a. Explain the critical section problem and propose a solution for it.

OR

b. Describe about producer consumer problem.

13 a. Explain about fragmentation in detail.

OR

b. Explain the steps in handling a page fault with diagram.

14 a. Describe about file protection in detail.

OR

b. Explain about directory implementation.

15 a. Describe about the levels of RAID in detail.

OR

b. With diagram explain the Kernel I/O subsystem.

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Sl.No. 1569 SUBJECT CODE: 35012402

VINAYAKA MISSIONS RESEARCH FOUNDATION

(Deemed to be University)

B.E.DEGREE EXAMINATIONS- FEB - 2022

COMPUTER SCIENCE AND ENGINEERING

FOURTH SEMESTER

OPERATING SYSTEMS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Mention the few process states.

2 Give the multithreading models.

3 Define Non-Pre-emptive scheduling.

4 What is deadlock?

5 What do you mean by internal fragmentation?

6 Give few advantages of demand paging.

7 What are the directory structures available?

8 Differentiate absolute path name and relative path name.

9 Name some disk performance parameters.

10 Mention the use of RAID.

PART-B (5 x 16 = 80)

11 a. Discuss in detail about the types of system calls with examples.

OR

b. Draw the process control block and explain.

12 a. Explain the critical section problem and propose a solution for it.

OR

b. Explain in detail prevention of deadlock.

13 a. Explain about fragmentation in detail.

OR

b. Explain page replacement algorithms with examples.

14 a. Describe about file protection in detail.

OR

b. Discuss about file system in Windows XP.

15 a. Describe about the levels of RAID in detail.

OR

b. Explain about the Tertiary Storage Structures available.

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Sl.No. 1566 SUBJECT CODE: 35012704

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
SEVENTH SEMETER
C#&.NET FRAME WORK

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 How is c# better than java?
2 What do you mean by explicit conversion?
3 What are the restrictions of static methods?
4 List the operators that cannot be overloaded.
5 Define trace class.
6 Define Remoting.
7 What are the advantages of ADO.NET?
8 What are the advantages of ADO.NET model?
9 Define Client-side support.
10 How to add the server-side controls to web form?

PART-B (5 x 16 = 80)

11 a. Write short notes on the following
a)Common Type System b) Common Language Specification.

OR

b. Explain the inheritance concepts in C#.How to use sealed method in it.

12 a. Briefly explain about Hash set in c# .Give example program to implement it.

OR

b. How to construct regular expression in c# with the help of REGEX class ?explain with examples.

13 a. How to send & receive the socket in C# .Write the example program for communication.

OR

b. Briefly Explain about Tracing and events in C# with suitable examples

14 a. What is the difference between DataSet and DataTable Class.

OR

b. Using diagram, compare connected and disconnected modes of ADO.Net

15 a. List and explain various server controls used in ASP.Net in brief.

OR

b. What is AJAX? Explain with examples.

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Sl.No. 1565 SUBJECT CODE: 34612601

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
ELECTRICAL AND ELECTRONICS ENGINEERING
SIXTH SEMESTER
POWER SYSTEM ANALYSIS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Explain the requirements of planning the operation of a power system.

2 What are the methods available for forming bus impedance matrix?

3 How a load flow study is performed?

4 How approximation is performed in Newton-Raphson method?

5 What is meant by a fault?

6 Give the equation to determine sub transient and transient internal voltage of the generator.

7 Prove that. $1+a+a^2=0$

8 Name the fault in which positive and negative sequence voltages are equal.

9 Write down the units of inertia constants M and H and their inter relationship.

10 Define synchronizing coefficient.

PART-B (5 x 16 = 80)

11 a. A 15 MVA, 8.5KV, 3- phase generator has a sub transient reactance of 20%. It is connected through a Δ-Y transformer to a high voltage transmission line having a total series reactance of 70Ω. The load end of the line has Y-Y step down transformer. Both transformer banks are composed of 1ϕ transformer connected for 3ϕ operation. Each of three transformers composing 3ϕ bank is rated 6667 KVA, 10/100 kV, with a reactance of 10%.The load represented as impedance is drawing 10MVA at 12.5kV and 0.8pf lagging .Draw the single line diagram of power network. Choose a base of 10MVA, 12.5kV in the load circuit and determine the reactance diagram. Determine also the voltage at the terminals of the generator.

OR

b. Obtain the expression for nodal admittance equation.

12 a. Compare NR Method, Gauss seidel method and Fast Decoupled Power Flow method of load flow studies.

OR

b. Explain the Fast Decoupled Power Flow Method for load flow problem with a neat flow chart.

13 a. Explain the short circuit model of a synchronous machine under short circuit conditions.

OR **P.T.O**

b. A generator is connected through a circuit breaker to a transformer. The ratings of the generator are 100MVA, 18 kV, X_d"=19% and X_d' =26% X_d = 130%. The transformer ratings are 100 MVA,240/18kV, Y-Δ, X=10% with 18kV on Δside. If a three phase short circuit occurs on the high tension side of a transformer at rated voltage and no load, find (a). initial symmetrical rms current in the transformer winding on the high tension side. (b) initial symmetrical rms current in the line on the low tension side.

14 a. Derive an expression for the positive sequence current I_{a1} of an unloaded generator when it is subjected to a double line to ground fault.

OR

b. A salient pole generator without dampers is rated 20 MVA, 13.6 KV and has direct axis sub – transient reactance of 0.2 per unit. The negative and zero sequence reactances are respectively, 0.35 and 0.1 per unit. The neutral of the generator is solidly grounded. With the generator operating unloaded at rated voltage with Eab = 1.0 ∟0° per unit, a single line to ground fault occurs at the machine terminals which then have per – unit voltage to ground, Va = 0; Vb = 1.013∟-102.25°; Vc = 1.013∟102.25°. Determine the sub transient current in the generator and the line to line voltage for sub transient conditions due to the fault.

15 a. Explain critical clearing time and critical clearing angle.

OR

b. Derive the Power Angle Equation.

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Sl.No. 1567 SUBJECT CODE: 34415709

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- FEB - 2022
MECHANICAL ENGINEERING
SEVENTH SEMESTER
ELECTIVE – UNCONVENTIONAL MANUFACTURING PROCESSES

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1	Define unconventional machining processes.
2	Define EDM.
3	Write short notes on mass flow rate.
4	Give the frequency range of USM.
5	Define the Principle of EDM.
6	List three types of wear takes place in EDM tool.
7	List out any four etchant.
8	Write the applications of ECM.
9	What is LASER?
10	Write any four applications of LBM.

PART-B (5 x 16 = 80)

11	a.	Explain the process economy of various unconventional machining processes.
		OR
	b.	Discuss the selection UMP to produce required shape.
12	a.	Discuss with neat diagram various feed mechanism used in USM.
		OR
	b.	Elaborately discuss about process parameters in USM.
13	a.	Explain the functions of dielectric fluid used in EDM.
		OR
	b.	Discuss the features of wire cut EDM.
14	a.	Discuss the advantages, disadvantages and applications of ECM.
		OR
	b.	Compare the similarities and differences of ECM, ECG and ECH.
15	a.	Elaborately discuss about process parameters in EBM.
		OR
	b.	Discuss the advantages, disadvantages and applications of LBM.

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Sl.No. 1561 SUBJECT CODE: 35012506

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
ELECTRICAL AND ELECTRONICS ENGINEERING
FIFTH SEMESTER
DATA STRUCTURES

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Why is array based implementation of lists difficult?

2 What is a double ended queue?

3 What is an expression tree?

4 What are the operations possible in a binary search tree?

5 Give three properties of heaps.

6 How does heap sort work?

7 Define Collision.

8 Define smart union algorithms.

9 Define a cycle in a graph.

10 What is a complete Graph?

PART-B (5 x 16 = 80)

11 a. Describe in detail about linked list implementation of stack.

OR

b. Illustrate the concept of circular queue in detail.

12 a. Explain the concept of binary tree.

OR

b. Describe the insertion and deletion operations in binary search tree.

13 a. Construct a min heap tree for the following 5,2,6,7,1,3,8,9,4.

OR

b. What are B-Trees? Explain insertion operations of B-Trees in detail with an example

14 a. Describe Dynamic equivalence problem

OR

b. Explain the open addressing collision resolution techniques in detail.

15 a. Explain Dijkstra’s algorithm with an example.

OR

b. Explain basic terminologies in graph.

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Sl.No. 1564 SUBJECT CODE: 35012404

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
FOURTH SEMESTER
GRAPHICS DESIGN AND MULTIMEDIA ANIMATION

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What is Output Primitive?

2 How DDA differs from Bresenham's line drawing algorithm.

3 Categorize the 3D representations?

4 What is Quadric Surfaces?

5 Define hologram.

6 Define abstract images.

7 What are the levels of definition in JPEG standards?

8 What are the factors that affect video performance?

9 What are the characteristics of Document store?

10 Give the primary goal of MAPI.

PART-B (5 x 16 = 80)

11 a. Discuss Bresenham's algorithm for ellipse.

OR

b. Explain Line clipping algorithms

12 a. Discuss 3D Rotation with neat diagram.

OR

b. Explain 3D viewing.

13 a. State and explain computer animation with an example diagram.

OR

b. Write the procedure for simulation of a running car on the road using using blender 3D animation software

14 a. State and explain Compression and its types.

OR

b. Explain in detail lossless compression .

15 a. Explain Distributed Client-server operation.

OR

b. Explain with neat diagram of multimedia Object Servers.

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Sl.No.1562 **Sub. Code:34116101**

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.E. DEGREE EXAMINATION – FEB – 2022

ELECTRICAL AND ELECTRONICS ENGINEERING

First Semester

CALCULUS FOR ENGINEERS

(Candidates admitted under 2016 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. What is radius of curvature at (3,4) on $x^2 + y^2 = 25$?
2. Find ρ for the curve $x = \cos\theta$, $y = a\sin\theta$ *at* θ.
3. If $u = (x-y)\,(y-z)\,(z-x)$ show that $\frac{\partial u}{\partial x} + \frac{\partial u}{\partial y} + \frac{\partial u}{\partial z} = 0$.
4. Find $\frac{du}{dt}$ when $u = \sin\left(\frac{x}{y}\right)$, $x = e^t$, $y = t^2$.
5. Evaluate $\int \cos^2 4x\, dx$.
6. Integrate $\tan^{-1} x$ with respect to 'x'.
7. Evaluate $\iint dxdy$ over the region bounded by $x = 0,\ x = 2,\ y = 0$ and $y = 2$.
8. Evaluate $\int_0^2 \int_x^{x^2} e^{\frac{y}{x}} dy\, dx$.
9. Find the value of 'a' so that the vector $\vec{F} = (x+3y)\vec{i} + (y-2z)\vec{j} + (x+az)\vec{k}$ is Solenoidal.
10. Find the value of $\nabla^2\left(\frac{1}{x+y+z}\right)$.

PART-B (5 x 16 = 80 Marks)

11.a) Find the radius of curvature for the curve $\sqrt{x} + \sqrt{y} = 1$ at $\left(\frac{1}{4}, \frac{1}{4}\right)$.

OR

b) Find the radius of curvature at the point θ on $x = 3a\cos\theta - a\cos 3\theta$ and $y = 3a\sin\theta - a\sin 3\theta$.

12.a) Find the minimum value of $x^2 + y^2 + z^2$ subject to the condition $\frac{1}{x} + \frac{1}{y} + \frac{1}{z} = 1$.

OR

b) Examine $f(x, y) = x^3 + y^3 - 3xy$ for maximum and minimum values.

(P.T.O)

13.a) (i) Evaluate $\int_0^{\pi/2} \frac{\cos x dx}{(1+\sin x)(2+\sin x)}$ (ii) Evaluate $\int \frac{dx}{x(x^4-1)}$

OR

b) Evaluate $\int \frac{x^2+1}{\left(x^2-1\right)\left(2x-1\right)} dx$

14.a) (i) Evaluate the double integral $\iint_R (4-x^2-y^2)dxdy$ if the region R is bounded the straight lines $x=0,\ x=1,\ y=0$ and $y=\frac{3}{2}$

(ii) Using double integral, Find the area bounded by $y=x$ *and* $y=x^2$

OR

b) Change the order of integration and then evaluate $\int_0^1 \int_{x^2}^{2-x} xydydx$.

15.a) Verify the Gauss divergence theorem for $\vec{F} = 4xz\vec{i} - y^2\vec{j} + yz\vec{k}$ over the cube bounded by the $x=0,\ x=1,\ y=0,\ y=1,\ z=0, z=1$.

OR

b) Verify Green's theorem in the plane $\int_c (x^2-y^2)dx + 2xydy$ where C is the boundary of the rectangle in the XOY - plane bounded by the lines $x=0,\ x=a,\ y=0$ and $y=b$.

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Sl.No.1562

Sl.No. 1563 **Sub. Code: 34115502**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E. DEGREE EXAMINATION- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
Fifth Semester
DISCRETE MATHEMATICS

(Candidates admitted under 2015 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Obtain a disjunctive normal form of $P \wedge (P \to Q)$.

2. Let P : I will study Discrete mathematics.
3. Symbolize "Sam is poor and Ram is intelligent".
4. Find the truth value of $(x)(P(x) \vee Q(x))$ with $P(x): x = 1, Q(x): x = 2$ and the universe of discourse is $A = \{1, 2\}$.
5. How many students must be in a class to guarantee that at least two students receive the same score on the final exam, if the exam is graded on a scale from 0 to 100 points?

6. There are 6 books on Economics, 3 on Commerce and 2 on History. In how many ways can these be placed on a shelf if books on the same subject are to be together?

7. Check whether $(N, +)$ is a group or not.
8. Define normal subgroup.
9. Define Bounded Lattice.
10. Simplify: $(x + \overline{y} + \overline{z})(x + \overline{y} + z)$.

PART-B (5 x 16 = 80 Marks)

11.a) Without using truth table find the PCNF and PDNF of $(P \to (Q \wedge P)) \wedge (\neg P \to (\neg Q \wedge \neg R))$.

OR

b) Without using the truth table show that

(i) $P \to (Q \to P) \Leftrightarrow \neg P \to (P \to Q)$.

(ii) $(P \to Q) \wedge (R \to Q) \Leftrightarrow (P \vee R) \to Q$.

12.a) Prove that $(x)(P(x) \to (Q(Y) \wedge R(x))), (\exists x) P(x) \Rightarrow Q(y) \wedge (\exists x)(P(x) \wedge R(x))$.

OR

b) Establish the validity of the following argument

"All integers are rational numbers. Some integers are powers of 2.Therefore some rational numbers are powers of 2".

P.T.O

13.a) Solve the recurrence relation $S(k)-4S(k-1)-11S(k-2)+30S(k-3)=0$, with $S(0)=0$, $S(1)=-35$ and $S(2)=-85$.

OR

b) Find the number of integers between 1 and 250 both inclusive that are not divisible by any of the integers 2, 3, 5 and 7.

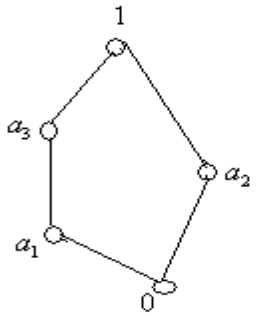
14.a) Prove that a group $(G,*)$ is abelian iff $(a*b)^2=a^2*b^2, \forall a,b\in G$.

OR

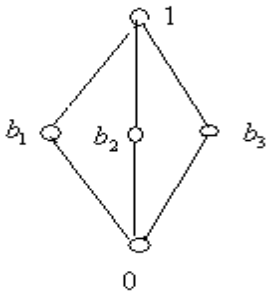
b) (i) Prove that the identity element of a group is unique.

(ii) Prove that the inverse element of a group is unique.

15.a) Check the Lattice given by the diagrams are distributive or not



(a)



(b)

OR

b) Prove the following Boolean lattices

(i) $a\cdot a=a$

(ii) $a+(a'\cdot b)=a+b$

(iii) $a\cdot(a'+b)=a\cdot b$

(iv) $(a\cdot b)+(a\cdot b')=a$

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Sl.No. 1560 SUBJECT CODE: 35012703

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
SEVENTH SEMESTER
SOFTWARE TESTING

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 List out the levels of testing maturity model.
2 How do we write a test case for Oracle?
3 List the two basic Testing strategies.
4 Write short notes on Usage profiles.
5 Write a short note on Summary report.
6 What is regression testing.
7 Illustrate the Work Breakdown Structure (WBS).
8 Define Test Procedure & test log.
9 What are the four major activities associated with Configuration management?
10 What are the various components of review plans?

PART-B (5 x 16 = 80)

11 a. Describe Origins of defects with neat diagram.

OR

b. Write short notes on: Errors, Faults, Failures, Test case, Test, Test oracle, Test bed, SQA group.

12 a. Discuss about following techniques
a)Cause – and - Effect graphing b) State transition testing .

OR

b. Explain Black Box Testing and COTS (Commercial Off-the-shelf) components.

13 a. Explain about the class as testable unit.

OR

b. Explain the goals, procedures and functions of Integration Test.

14 a. Give Details about Test Plan Attachments.

OR

b. What role do managers play in support of a test group?

15 a. Narrate on the Types of reviews.

OR

b. What role do user/client play in the development of test plan for a project? Should they be present at any of the test plan reviews? Justify your answer.

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Sl.No. 1558 SUBJECT CODE: 34612505

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB- 2022
ELECTRICAL AND ELECTRONICS ENGINEERING
FIFTH SEMESTER
ELECTIVE - DESIGN OF ELECTRICAL APPARATUS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Enumerate the items to be mentioned in the rating plates of Rotating machinery.

2 What are the fundamental requirements of the high conductivity material?

3 Write the expression for power developed in the armature of dc machine in terms of maximum gap density.

4 Mention the factors to be considered in the design of commutator.

5 Define Tertiary Winding.

6 List the different methods of cooling of transformers.

7 Name the materials used to insulate the laminations of the core of induction motor.

8 Write the formula for air-gap in case of three phase induction motor in terms of length and diameter.

9 State three important features of Turbo Alternator Rotors.

10 Define Dispersion Coefficient.

PART-B (5 x 16 = 80)

11 a. (i) What are the limitations of electrical drive (ii) Explain and derive the equation of ambient temperature.

OR

b. Calculate the temperature difference between the centre of the embedded portion of a conductor and the overhang. The length of the machine is 0.5m and the current density in the conductor is $4A/mm^2$. The thermal resistivity of copper is 0.0025Ωm. Assume that the total heat produced is conducted along the length of the conductor and the electrical resistivity of the conductor is $0.021x10^{-6}$Ωm.

12 a. A 15 kW, 230V, 4 pole dc machine has the following data: armature diameter= 0.25m , armature length =0.125 m, length of air-gap at pole centre =2.5 mm ,flux per pole = $11.7x10^3$ Wb, pole arc /pole pitch =0.66. Calculate the mmf required for air gap (i) if the armature surface is treated as smooth (ii) if the armature is slotted and gap contraction factor is 1.18.

OR

(P.T.O)

b. Draw the winding diagram in the developed form for a 4 pole, 12 slots simplex lap connected dc generator with commutator having 12 segments. Indicate the position of brushes.

13 a. A three phase, 50 Hz, oil cooled core type transformer has the following dimensions. Distance between core centers =0.2m, Height of window =0.24m Diameter of circumscribe circle=0.14m.The flux density in the core =1.25Wb/m^2 .The current density of conductor =2.5A/mm^2.Assume a window space factor of 0.2 and the core area factor=0.56.The core is 2 stepped. Estimate KVA rating of the transformer.

OR

b. Write brief notes on (i) Square Core (ii) Two Stepped Core.

14 a. Determine the approximation diameter and length of Stator Core, the number of Stator Slots and the number of Stator Conductors for a 11KW , 400V, three phase, 4 pole, 1425rpm ,delta connected induction motor. B_{av} =0.45 Wb/m^2, ac =23000amp.cond/m, full load efficiency =0.85, pf=0.88, L/τ =1 .The stator employs a double layer winding.

OR

b. Design a cage rotor for a 40 HP ,3 phase ,400V ,50 Hz ,6 pole ,delta connected induction motor having a full load efficiency of 87% and a full load pf of 0.85.Take D=33cm and L= 17cm. Stator slots=54,conductors per slot =14. Assume suitable missing data if any.

15 a. Derive the estimation of air-gap length using SCR.

OR

b. For a 250 kVA, 1100 V, 12 pole, 500 rpm, 3-phase alternator. Determine air gap diameter, core length, number of starter conductors, numbers of stator slots and cross-section of stator conductors. Assuming average gap density as 0.6Wb/m^2 and specific electric loading of 30,000 amp.cond/m. L/t=1.5.

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S.No.1557 **SUBJECT CODE: 34415707**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB- 2022
MECHANICAL ENGINEERING
SEVENTH SEMESTER
ELECTIVE - POWER PLANT ENGINEERING

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What is the use of draft tube?

2 Where should be surge tank located?

3 List any two advantages of cyclone burner.

4 What are the advantages of closed cycle gas turbine?

5 What are the advantages of fast breeder reactor?

6 Define breeding.

7 What is Load factor?

8 What is meant by annual depreciation cost?

9 Define thermo electric power.

10 What are the two types of hydrogen fuel cells?

PART-B (5 x 16 = 80)

11 a. Compare thermal power plant with hydel power plant.

OR

b. Compare nuclear power plant with hydel power plant

12 a. Explain the different types of coal handling process.

OR

b. Draw and explain the steam and gas turbine combined power cycles.

13 a. With a neat sketch explain the layout of nuclear power plant.

OR

b. Discuss the principle of tidal power plant with a neat sketch.

(P.T.O)

14 a. The peak load on the thermal plant is 75MW.The loads having maximum demands of 35MW, 20MW, 15MW and 18MW are connected to the power plant. The capacity of the power plant is 90MW and the annual load factor is 0.53.Calculate (a) The average load on the power plant (b) The energy supplied per year (c) The demand factor (d) The diversity factor.

OR

b. A thermal power station consist of two 60 MW units each running for 7320hrs a year and one 30MW unit running for 1800 hrs a year. The energy produced by the plant per year is $725x10^6$KW-hr. Determine the plant load factor and plant use factor. Assume maximum demand is equal to plant capacity.

15 a. What is fuel cell? How is it different from a battery? Give the essential functions of fuel cells.

OR

b. Explain the principle of thermo electric power generation.

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Sl.No. 1556 SUBJECT CODE: 34412707

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- FEB - 2022
MECHANICAL ENGINEERING
SEVENTH SEMETER
ELECTIVE - RENEWABLE SOURCES OF ENERGY

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What is meant by solar pond?

2 What are materials used in solar flat plate collectors.

3 What is the average wind speed (Km/h) considered as good for operation of wind mill.

4 Define thrust force.

5 Mention various forms of renewable energy?

6 What are the raw materials required for fermentation?

7 Define Wave patterns.

8 Define surge tank.

9 What is meant by Life cycle analysis in new energy sources?

10 What is meant by fuel cell.

PART-B (5 x 16 = 80)

11 a. Draw and explain the solar thermal power plant.

OR

b. Explain briefly about solar water pump with the help of a neat sketch.

12 a. Distinguish clearly between the following:
a) Constant speed - constant frequencies WTG.
(b) Variable speed - constant frequency WTG.

OR

b. Explain with a neat diagram of various types of wind generators.

13 a. Explain briefly about the construction techniques of bio gas plant with neat sketch.

OR

b. Explain the details of down-draught and cross-draught gasifier.

14 a. Explain the Applications of GIS in geo-sciences.

OR

(P.T.O)

b. Enumerate the advantages and disadvantages of tidal power plant.

15 a. Explain the National energy policy.

OR

b. Discuss the advantages and disadvantages of fuel cell.

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Sl.No. 1559 SUBJECT CODE: 34115202

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
SECOND SEMESTER
CHEMISTRY FOR ENGINEERS

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define oxidation and reduction.

2 State the reaction when a lead storage battery is recharged?

3 Name any two Coagulants.

4 What is cathodic protection?

5 Why are plastics indispensible in everyday life?

6 What is degree of polymerization?

7 Define component with example.

8 Calculate the degree of freedom for 2 $H_2(g) + O_2(g) \rightarrow 2$ H2O(v)

9 Give the frequency region of Infrared spectrum.

10 State Retention time.

PART-B (5 x 16 = 80)

11 a. Explain the determination of EMF by Poggendorff's method.

OR

b. Discuss the electrochemical series and its applications.

12 a. (i)How is internal treatment of boiler water carried out?
(ii) Describe the principle and method involved in the determination of different types and amount of alkalinity of water.

OR

b. (i) Differentiate between chemical corrosion and electrochemical corrosion.
(ii) Illustrate the reactions involved in differential aeration corrosion with reference to the iron material.

13 a. (a). What are ceramics and how they are classified? Write the uses of ceramics.
(b). Write a note on Special cements.

OR

b. Write the preparation, properties and uses of the following
(i) PVC (ii) Teflon (iii) Bakelite

(P.T.O)

14 a. With suitable examples explain the terms phase, component and degree of freedom.

OR

b. Write a detail note on harmful effects of radioactive isotopes.

15 a. Describe Gas chromatography with neat diagram.

OR

b. How will you estimate metals by flame photometer?

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Sl.No. 1554 **Sub. Code:34215101**

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.E. DEGREE EXAMINATION - FEB – 2022

COMPUTER SCIENCE AND ENGINEERING

First Semester

ESSENTIAL OF CIVIL AND MECHANICAL ENGINEERING

(Candidates admitted under 2015 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

Use separate Answer books for Part I and Part II

PART – I: CIVIL ENGINEERING (50 marks)

PART – A (10 x 2 = 20 Marks)

1. What is meant by offset?
2. How brick earth is classified?
3. What are the uses of cement?
4. State the types of concrete
5. List out different types of shallow foundations.
6. What is meant by Shallow foundation?
7. Differentiate between stretcher bond and header bond.
8. List out the mortars used in masonry work.
9. Write short notes on gravity dam.
10. Define a lintel and mention the materials which are commonly used to construct it.

PART – B (3 x 10 =30 Marks)

1 . a) Draw 10 conventional symbols.

OR

b) What is chaining and explain the types of chain.

2. a) Explain different types of cement.

OR

b) Explain with neat sketches the different types of shallow foundations.

3. a) Briefly explain the types of Floors

OR

b) Write short notes on types of dames.

(P.T.O)

PART – II: MECHANICAL ENGINEERING (50 marks)

PART – A (10 x 2 = 20 Marks)

1. List out the different kinds of fossil fuels.
2. State the advantages and disadvantages of solar energy.
3. What is meant by super heater?
4. Differentiate the Nuclear fission and fusion.
5. What is meant by moderator?
6. List out the applications of four stroke and two stroke engines.
7. What is known as refrigerant?
8. Give some forging operations.
9. Why is a neutral flame extensively used in oxy-acetylene welding?
10. State the advantages and disadvantages of gas welding.

PART – B (3 x 10 =30 Marks)

11. a) Draw the layout and explain the working principle of steam power plant.

OR

b) Compare the steam power plant with hydro power plant.

12. a) Explain the vapour compression refrigeration system with neat sketch.

OR

b) Discuss the working principle of a window room air conditioning system with neat sketch

13. a) Briefly explain the preparation of the Green sand moulding with neat sketch.

OR

b) Explain with neat sketch about the Arc welding.

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Sl.No. 1555 **Sub. Code: 34112202**

VINAYAKA MISSIONS RESEARCH FOUNDATION
B.E DEGREE EXAMINATION – FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
Second Semester

ENGINEERING MATHEMATICS - II

(Candidates admitted under 2012 Regulations – CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Solve $\left(D^2-1\right)\left(D+2\right)y=0.$
2. Find the C.F of $\left(D^3-4D\right)y=x.$
3. Evaluate $\int_0^2\int_1^3\int_1^2 xyzdzdydx.$
4. Evaluate $\int_0^{\pi/2}\int_0^{2\cos\theta} r^2drd\theta.$
5. Find the value of 'a' so that the vector $\vec{F}=(x+3y)\vec{i}+(y-2z)\vec{j}+(x+az)\vec{k}$ is Solenoidal.
6. State Green's theorem in plane.
7. Show that the function $u=\frac{1}{2}\log\left(x^2+y^2\right)$ is harmonic.
8. State any two properties of Analytic function.
9. State Cauchy's integral theorem.
10. Find the residue of $f(z)=\frac{z}{(z-1)^2}$ at its pole.

PART-B (5 x 16 = 80 Marks)

11. a) (i) Solve $(D^2+2D+1)y=e^{-x}+3$

(ii) Solve $(D^3+3D^2+3D+1)y=5+\cos 2x$

OR

b) Solve the simultaneous equations $\frac{dx}{dt}+2y+\sin t=0, \frac{dy}{dt}-2x-\cos t=0$

12. a) Change the order of integration and then evaluate $\int_0^1\int_{x^2}^{2-x} xydydx.$

OR

[P.T.O]

b) Evaluate $\iint_R r^2 \sin\theta dr d\theta$, where R is the region above the initial line of the curve $r = 2a\cos\theta$.

13. a) (i) Prove $\vec{F} = (y^2\cos x + z^3)\vec{i} + (2y\sin x - 4)\vec{j} + 3xz^2\vec{k}$ is irrotational and find its scalar potential.

(ii) Prove that $\nabla^2(r^n) = n(n+1)r^{n-2}$ *where* $\vec{r} = x\vec{i} + y\vec{j} + z\vec{k}$ *and* $r = |\vec{r}|$

OR

b) Verify the Gauss divergence theorem for $\vec{F} = (x^3 - yz)\vec{i} - 2x^2y\vec{j} + 2\vec{k}$ over the cube bounded by x = 0, y = 0, z = 0 and x = a, y = a, z = a.

14. a) . If $f(z) = u + iv$ is an analytic function and $u - v = e^x(\cos y - \sin y)$, find $f(z)$ in terms of z.

OR

b) (i) If $v(x, y) = e^x \sin y$ find $f(z) = u + iv$

(ii) Show that $\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2} = 4\frac{\partial^2}{\partial z \partial \bar{z}}$

15. a) (i) Using Cauchy's Integral Formula, Find the value of $\int_C \frac{z+4}{z^2+2z+5} dz$ where C is the circle $|z + 1 - i| = 2$

(ii) Evaluate $\int_c \frac{zdz}{z-2}$ where c is the circle |z| =1.

OR

b) Expand $f(z) = \frac{1}{(z+1)(z+3)}$ in Laurent's series valid for the regions

(i) $|z| > 3$ and (ii) $1 < |z| < 3$.

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Sl.No. 1545 SUBJECT CODE: 35015201

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
SECOND SEMESTER
C PROGRAMMING

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What are the memory requirements of primary data type?

2 Mention the various types of operator

3 Write the syntax of switch statement.

4 Write the Syntax of for statement?

5 Find the length of following strings using strlen( ) function,
char s1[ ]=”program”;
char s2[ ]=”importance”;

6 How to declare a union variable?

7 Define library function

8 What are the advantages of using a pointer?

9 Write the rules for preprocessor directives.

10 What is the use of fseek( ) function?

PART-B (5 x 16 = 80)

11 a. Explain the Arithmetic and relational operators in C with suitable program.

OR

b. Write a C program
i) To find sum of 5 numbers.
ii) To find simple interest.

12 a. Explain the types of looping statements.

OR

b. Write a C program:
a. i. To find the factorial of a given number using while statement
b. ii. To find the factorial of a given number using for statement

13 a. Write a C program to explain the concept of structure.

OR

b. Write a C program to explain the concept of structure within structure.

14 a. Discuss the pointer expressions used in the C program.

OR

b. Write a C program to implement function returning pointers.

15 a. Write a C program to altering the allocated memory.

OR

b. Write about the following function,
i. fputs( ) ii. fgets( ) iii. fread( ) iv. fwrite( )

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Sl.No. 1546 SUBJECT CODE: 35012608

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
SIXTH SEMESTER
CRYPTOGRAPHY AND NETWORK SECURITY

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Compare threat, attack and vulnerability.

2 State the Euler's Phi Function (Φ).

3 Does RC4 is Stream Cipher? Justify your answer.

4 List the drawbacks of Cipher Block Chaining (CBC) mode.

5 Define Message Authentication Code (MAC).

6 Define Trapdoor one way function.

7 Define S/MIME.

8 What is the purpose of Dual Signature?

9 What do you meant by honeypot?

10 List the design goals of firewalls.

PART-B (5 x 16 = 80)

11 a. Explain the various security services in OSI security model (X.800) in detail.

OR

b. Explain Transposition technique in detail with example.

12 a. Explain in details of Double DES and Triple DES with neat diagram.

OR

b. Explain RSA algorithm in detail with an example

13 a. Let α=7, q=23, X_A=3, X_B=5 find the following, (a).Calculate the Symmetric Key K (b). Calculate the value of Y_A and Y_B.

OR

b. Discuss in brief about RSA and ElGamal digital signature algorithm.

14 a. How Secure Socket Layer (SSL) establishes secure connection? Discuss briefly with neat sketch.

OR

b. Explain Public Key Infrastructure (PKI) in detail with neat sketch.

15 a. What is meant by virus? Explain various classification of virus and its countermeasures in detail.

OR

b. Explain the following in detail (a).Stateful Inspection firewalls (b).Application level gateway (c).Circuit level gateway

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Sl.No. 1544 SUBJECT CODE: 34716709

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E -DEGREE EXAMINATIONS - FEB-2022
ELECTRONICS AND COMMUNICATION ENGINEERING
SEVENTH SEMESTER
ELECTIVE – WIRELESS SENSOR NETWORKS

(Candidates admitted under 2016 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1	Define lifetime of a WSN.
2	Differentiate MANET and WSN in terms of the equipments required
3	State the significance of sleep state of a transceiver
4	Brief on passive narrow beam sensors
5	Define contention based MAC protocol.
6	What is PAMAS?
7	Define Topology.
8	Define Time of Arrival.
9	Define System on Chip nodes.
10	Give the classification of nesC codes.

PART-B (5 x 16 = 80)

11 a.	Describe the application examples of WSNs
	OR	
b.	Elucidate the mechanism involved to implement wireless sensor network.
12 a.	Elaborate on the power supply of sensor nodes
	OR	
b.	Describe the Gateway concepts of WSNs
13 a.	Explain contention based protocols & schedule based protocols
	OR	
b.	Elaborate on IEEE 802.15.4 MAC protocol.
14 a.	Explain range based localization algorithms
	OR	
b.	Explain information based sensor tasking
15 a.	Explain node level simulators
	OR	
b.	Explain the security considerations in wireless sensor networks

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Sl.No. 1547 Sub.Code: 34416804

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB – 2022

MECHANICAL ENGINEERING
Eighth Sixth Semester

ELECTIVE - INDUSTRIAL ENGINEERING

(Candidates admitted in under 2016 Regulation)

Time: Three hours Maximum: 100 Marks

Answer **ALL** questions

PART – A (10 x 2 = 20 marks)

1. List the types of flow process chart.
2. What is meant by “SIMO” chart?
3. What do you understand by process layout?
4. What are the two main functions of material handling?
5. Differentiate between operation sheet and route sheet.
6. Define production planning and control.
7. What are the three major functions of MRP?
8. What is meant by bill of materials?
9. What is a profit volume chart?
10. How labour legislation can be categorized?

PART – B (5 x 16 = 80 marks)

11. a) What are the factors affecting productivity? Explain in detail.

OR

b) Write notes on the following
   i. Design of man machine systems.
   ii. Design of working environment.

12. a) What are the different types of plant layout? Explain any two types of layout with neat sketches.

OR

b) Explain the combination and fixed position layout with suitable example and sketch.

13. a) What do you understand by Routing? Explain the various procedural steps involved in routing.

OR

b) Explain in detail steps involved in CPM project planning with suitable example.

14. a) What do you understand by inventory control? Explain the purpose of maintaining inventory in any production unit.

OR

b) What are the types of control charts? Explain each of them.

15.a) Explain the Quantitative methods in decision making.

OR

b) Define Labour Unions. Explain the functions and objectives of Labour Unions.

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Sl.No. 1543 SUBJECT CODE: 344

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
MECHANICAL ENGINEERING
THIRD SEMESTER
ENGINEERING THERMODYNAMICS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 When a system is said to be in thermodynamic equilibrium?

2 Prove that for an isolated system there is no change in internal energy.

3 What are the limitations of First Law of Thermodynamics?

4 Define effectiveness of a system.

5 Define the term saturated liquid.

6 Define triple point and critical point for pure substance.

7 State the Dalton's law of partial pressure

8 What is meant by isothermal compressibility?

9 Define percentage of excess air.

10 Define heating value of fuel.

PART-B (5 x 16 = 80)

11 a. A boiler produces steam from water at 35^{o}C. The enthalpy of steam is 2675 kJ/kg. Calculate the heat transferred per kg. Specific heat capacity of water is 4.19 kJ/kg. Neglect the potential and kinetic energies.

OR

b. In a steam power station, steam flows steadily through a 0.2 m diameter pipe line from the boiler to the turbine. At the boiler end, the steam conditions are found to be p = 4 Mpa, t = 400^{o}C, h = 3213.6 kJ/kg and v = 0.073 m^3/kg. The turbine end the conditions are found to be p = 3.5 MPa,t = 392^{o}C, h = 3202.6 kJ/kg and v = 0.084 m^3/kg. There is a heat loss of 8.5 kJ/kg from the pipe line. Calculate the steam flow rate.

12 a. One kg of air in a closed system initially at 5 ^{o}C occupying a volume of 0.3m^3 undergoes a constant pressure heating process to 100 ^{o}C. There is no work other than pdV work. Find the work transfer, heat transfer and the entropy change of the gas.

OR

P.T.O

b. 0.2 kg of air at 1.5 bar and 27^{o}C is compressed to a pressure of 15 bar according to the law $PV^{1.25}$ = C. Determine work done on or by air, heat flow to or from the air, increase or decrease in entropy.

13 a. A mass of 0.9 kg of steam initially at a pressure of 1.5 MPa and temperature of 250°C expands to 150 kPa. Assume the process is isentropic. Find the condition of steam and work transfer.

OR

b. Derive Clapeyron equation.

14 a. A vessel of volume 0.3 m^3 contains 15 kg of air at 303K. Determine the pressure exerted by the air using 1. Perfect gas equation. 2. Vander waals equation. 3. Generalised compressibility chart. Take Critical temperature of air is 132.8K, Critical pressure of air is 37.7 bar.

OR

b. Two vessels, A and B, both containing nitrogen, are connected by a valve which is opened to allow the contents to mix and achieve an equilibrium temperature of 27°C. Before mixing the following information is known about the gases in the two vessels.

Vessel A	Vessel B
p = 1.5MPa	p = 0.6MPa
t = 50°C	t = 20°C
Contents = 0.5 kgmol	Contents = 2.5 kgmol

Calculate the final equilibrium pressure and the amount of heat transferred to the surroundings. If the vessel had been perfectly insulated, calculate the final temperature and pressure which would have been reached. Take □ = 1.4.

15 a. During a trial on a boiler, the dry flue gas analysis by volume was obtained as CO_2 = 13%, CO = 0.3% , O_2 = 6% , N2 = 80.7%. The coal analysis by weight was reported as C = 62.4% , H_2 = 4.2% O_2 = 4.5%, moisture 15% and ash = 13%. Estimate : a). Theoretical air required to burn 1 Kg of dry coal b). Mass of air actually supplied per kg of dry coal c). The amount of excess air supplied per kg of dry coal burnt.

OR

b. Briefly explain the working principle of Junkers gas calorimeter.

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12301

Marks

S.No.1548 Sub.code: 35012505

VINAYAKA MISSION'S RESEARCH FOUNDATION, SALEM
(Deemed to be University)
B.E DEGREE EXAMINATION – FEB- 2022
FIFTH SEMESTER
ELECTIVE: - BUILDING ENTERPRISE APPLICATION

(Candidates admitted under 2012 Regulations-CBCS)

Three Hours Maximum: 100 marks

SECTION - A

I. Answer ALL Questions (100 x 1 = 100)

1 The software application , which imbibes _____ of the organizations, which are called enterprise applications.
a). flowchart b). Program Logic c). Business logic d). Presentation Logic

2 _____warrants the unification and standardization of data
a). Data cleaning b). Data harmonization c). coupling d). None of the above

3 BDUF stands for
a). bad data upfront b). big data upfront c). big data upforward d). big design upfront

4 The first item defined for a new system is its
a). Storage b). Outputs c). Inputs d). Processing

5 Software engineering primarily aims on
a). reliable software b). cost effective software c). reliable and cost effective software d). none of the above

6 Coupling and cohesion can be represented using a
a). Cause-effect graph b). Dependence matrix c). Structure chart d). SRS

7 FP-based estimation techniques require problem decomposition based on
a). Information domain values b). Project schedule c). Software functions d). Process activities

8 Function point metric of a software also depends on the
a). Number of function needed
b). Number of final users of the software
c). Number of external inputs and outputs
d). Time required for one set of output from a set of input data

9 Recorded software attributes can be used in the following endeavors :
i) Cost and schedule estimates.
ii) Software product reliability predictions.
iii) Managing the development process.
iv) No where
a).(i) (ii) (iv) b).(ii) (iii) (iv) c).(i) (ii) (iii) d).(i) (ii) (iii) (iv)

10 Which is not a size metric?
a). LOC b). Function count c). Program length d). Cyclomatic complexity

11 Which one of the following ISO standard is used for software process?
a). ISO 9000 b). ISO 9001 c). ISO 9003 d). ISO 9000-3

12 What is the first stage in program development ?
a). Specification and design b). System Analysis c). Testing d). None of the above

13 Modules X and Y operate on the same input and output data, then the cohesion is
a). Sequential b). Communicational c). Procedural d). Logical

14 Waterfall model is a
a). Linear model b). Iterative model c). Rapid model d). Interactive model

15 Prototyping is used to
a). test the software as an end product b). expand design details
c). refine and establish requirements gathering d). None of the above

16 Which is not a step of requirement engineering?
a). Requirements elicitation b). Requirements analysis
c). Requirements design d). Requirements documentation

17 _____ are of scrum principles.
A) Time-boxesB) Cross-functional teamsC) Open communications within team.D) All of above

18 In the spiral model 'risk analysis' is performed
a). In the first loop b). In the first and second loop
c). In every loop d). Before using spiral model

19 The component based development model is
a). Only appropriate for computer hardware design
b). Not able to support the development of reusable components
c). Works best when object technologies are available for support
d). Not cost effective by known quantifiable software metrics

20 The spiral model of software development
a). Ends with the delivery of the software product
b). Is more chaotic than the incremental model
c). Includes project risks evaluation during each iteration
d). All of the above

21 Which of the following is a non functional requirement of a web based application?
a). When the user clicks a "read me" link, the color of the link should change from blue to pink
b). When the user clicks a "read me" link, the next page should be opened within 5 seconds
c). When the user clicks a "read me" links, the mouse over should show the target page title in a tool tip
d). When the user clicks a "read me" links, the read me page should load successfully without errors

22 Which is true about functional requirement ?
a). A functional requirement is also called behavioral requirement
b). A functional requirement includes development and operational requirements
c). A functional requirement is a statement of how a software product must map program inputs to program outputs
d). None of the mentioned.

23 Which is true among these ?
a). The job of creating, modifying, and managing requirements over a product's lifetime is called requirement development
b). The portion of requirements engineering concerned with initially establishing requirements is termed requirements engineering
c). The portion of requirements engineering concerned with controlling requirements changes is called requirement management
d). All of the mentioned

24 Which of these does not belong to the qualities of operational requirements ?
a). Memory usage b). Portability c). Reusability d). b,c

25 Which of the following does data requirements allow for data ?
a). Entering data b). Leaving data c). Storing data in product d). All of the mentioned

26 Which of the following concepts is not a part of CORBA?
a). Polymorphism b).Lifecycle c). Inheritance d). Reuse

27 Which of the following is iterative, incremental, use case driven and architecture centric?
a).. V-method b). . UML c). . Component Based Development d). . RUP

28 Which of the following is iterative, incremental, use case driven and architecture centric? (
a) V-method (b) UML (c) Component Based Development d). RUP

29 What can UML interfaces be used for?
a) to provide concrete classes with the stereotype <<interface>>
b) to program in Java and C++, but not in C#
c) to define executable logic that can be reused in several classes
d) to specify required services for types of objects

30 Which GRASP pattern do you use to decide who is going to handle the incoming system events?
(a) Controller (b) Low coupling (c) Adapter (d) Information Expert

31 The traditional methodology used to develop, maintain, and replace information systems best defines:
a). SDLC b. RAD c. OOAD d. prototyping

32 The final form of testing COTS software is _____ testing.
a).Unit b).Integration (c) Beta (d) Module

33 The relationship between a derived class (or subclass) and base class is referred to as
(a) Association (b) Inheritance (c) Polymorphism

34 The best way to test the Software Project Management Plan (SPM
P) is by (a) Prototyping (b) Inspection (c) Simulation (d) Compilation

35 Software configuration activities would not include
a)Identify change (b)Control change
c)Ensure improper implementation of change (d)Report change to interested parties

36 In planning a software project one would
a)Find ways to produce results using limited resources
b)Pad the schedule to accommodate errors
c)Overestimate the budget
d)Structure the team to prevent administrative interference

37 The entity relationship diagram
a)Depicts relationships between data objects
b)Depicts functions that transform the data flow
c)Indicates how data are transformed by the system
d)Indicates system reactions to external events

38 Which of the following is not a logical layer of the application in client server system?
a)Presentation layer (b)Application layer (c)Data Management layer (d)Programming layer

39 Which of the following statements is from the agile manifesto?
a).Individuals and interactions over contract negotiation
b).Individuals and interactions over comprehensive documentation
c).Individuals and interactions over processes and tools
d).Responding to change over contract negotiation

40 Which is not a goal of a Daily Stand Up meeting?
a).To keep team members informed of progress
b).To raise potentials issues and risks up for resolution
c).To gain insights into delayed and "stuck" tasks
d).To confirm business requirements understanding

41 ROI stands for
a) Return on Investment (b) Return on Innovation
c) Revised of Investment (d) None of the above

42 _____Is the enterprise architecture framework for the telecommunications domain?
(a) TOGAF (b) POJO (c) NGOSS (d) EJB

43 The middle layer of logical architecture
(a) Data Access Layer (b) Service Access Layer (c) Business Layer (d) Presentation Layer

44 Examples of software architecture pattern
(a) Box and Line diagram (b) Repository diagram (c) Pipes and Filter diagram (d) All of the above

45 Match it:
(i) Logging - (a) Data Access Layer
(ii) Database - (b) usiness Layer
(iii) EJB - (c) Presentation Layer
(iv) Web Browser - (d) Infrastructure Layer
(a).:i-a, ii-b, iii-c, iv-d
(b) i-a, ii-c, iii-b, iv-d-
(c) i-d, ii-a, iii-b, iv-c
(d) i-d, ii-b, iii-c, iv-a

46 Choose UML Tools:
a) Rational s/w modeler (b) Together Architect (c) Visio (d) All of the above

47 Keep track of the state of an application across multiple request
a) Cache (b) Logging (c) Session (d) Security

48 SP, Servlet, EJB, --------
a) Oracle (b) VISIO (c) Struts (d) TOGAF

49 EJB have the process of:
a) Business (b) Presentation (c) Data (d) Integration

50 UML diagrams created using modeling tools like
(i) Relational Rose (ii) VISIO (iii) Together Architect
(iv) Relational Software Modeler v) by hand
a).i ,ii, iii, iv (b) i, ii, iv (c) iii, iv (d) i ,ii, iii, iv, v

51 Which layer denotes "Heart of an Enterprise Application?"
a) Business Layer (b) Data Access Layer (c) Integration Layer (d) Presentation Layer

52 Statement SOAP are considered heavy weight REST are considered light weight Conclusion:
(a)Both are false b)(i) True (ii) False (c) Both are true (d) (i) False (ii) True

53 The tool supports XML modeling.
a).XML Spy
b).XML Sky
c) XML Fly
d). XML Try

54 Match the following.
i).Networking - (a) TIBCD,CORBA
ii).IT hardware and software - (b) ITIL
iii).Middleware - (c) DNS,
iv).Firewalls Infrastructure Management - (d) MySQL, JBoss,Apache Code:
a). i – b ii – c iii – d iv – a
b).I – c ii – d iii – a iv – b
c). I – a ii – b iii – c iv – d
d).I – a ii – c iii – d iv – b

55 _____ is a hardware Firewall
a). Cisco Pix b).Load balances c). DNS d). DMZ

56 Oracle, SQL, DB2 is _____.
a). Database Server b).Application Server c). Web Server d).Operating System

57 Admin wizards, Commands, Shell Scripting are related to
a). My SQL, DB2 b). Linux, Unix, Mac OS
c). Web logic, JBoss, and Glassfish d). Apache, Microsoft ITS

58 Statement
1: MOM is based on Client/Server Architecture Statement
2: RPC is also based on Client/Server Architecture
a). Both Statements are Correct
b). Both Statements are Wrong
c). Statement -1 is only Wrong
d). Statement -2 is only Wrong

59 Expand ITIL
a). Infrastructure Technology Information Library
b). Information Library Infrastructure Technology
c). Information Technology Industry Library
d). Information Technology Infrastructure Library

60 Which are all the following is Application Server?
a). MySQL, DB2 b) Linux, UNIX, Mac OS
c). Web Logic, JBoss and Glassfish d). Apahe, Microsoft IIS

61 AOP is related with
a).Logging and error handling b). Exception handling
c).Session Management d). Event handling

62 Presentation layer Construction done using
a). Struts b). JSF c). Tapestry and Stripes d). All of the above

63 Static code analysis tools.
a). Find bugs Check Style PMD All of the above

64 Time threat , dead lock are related with
a) Code profiling b) Code coverage c) Both of the above d) None of the above

65 _____ includes only code profiling and coverage
a).Static code analysis
b.Dynamic code analysis
c). Both of the above
d). None of the above

66 JSF is governed by
a). JPC b). RPC c). JCP d). JCS

67 Select the business layer components EJB3.0 and Spring Struts and JSF AJAX and Hibernate POJO and POJI

68 _____Provides bridge between the java and relational data by providing mappings through XML
a). ADO b). DAO c). ORM d). POJO

69 Apache Ant coupled with _____ for scripting to be extended
a). Python b). AJAX c). Maven d). Jython

70 _____ is/are IDE for Java
a). JCreator b). Netbeans c). Eclipse d). All of the above

71 What is Remote method invocation (RMI)?
a) RMI allows us to invoke a method of java object that executes on another machine.
b) RMI allows us to invoke a method of java object that executes on another Thread in multithreaded programming.
c) RMI allows us to invoke a method of java object that executes parallel in same machine.
d) None of the mentioned

72 Which method is called first each time a Servlet is invoked ? a). Start() b). Run() c). Service() d). init()

73 ejbCreate() method of CMP bean returns
a). null b)) Primary Key class c). Home Object d). Remote Object

74 How many Queues does a MDB listen to ?
a). 1 b). 2 c). Any Number d). 10

75 The _____ mechanism is used to designate what a Web Service can do.
a). SOAP b). WSDL c). UDDI d). TFTP

76 The _____ technology allows creation of Web Services in Java.
a). RMI b). IIOP c). JRMP d). JWS

77 AJAX coding needs to be done on _____.
a). only server b). only client c). client and server d). none of these

78 The "J" in AJAX stands for _____.
a). JSON b). JRuby c). Java d). JavaScript

79 Which of the following design patterns is used to separate the task of writing the GUI screens and business logic?
a). View Logic b). Front Controller c). Model View Controller d). Business View

80 _____ Controller Servlet in struts
a). ActionServlet b). FrontControllerServlet c). FormBean class d). Action class

81 If an expected result is not specified then:
a) We cannot run the test
b) It may be difficult to repeat the test
c) It may be difficult to determine if the test has passed or failed
d) We cannot automate the user inputs

82 Test are prioritized so that:
a) You shorten the time required for testing(b) You do the best testing in the time available(
c) You do more effective testing(d) You find more faults

83 Which of the following statements about component testing is not true?
(a) Component testing should be performed by development
(b) Component testing is also know as isolation or module testing
(c) Component testing should have completion criteria planned
(d) Component testing does not involve regression testing

84 The purpose of requirement phase is (
a) To freeze requirements(b) To understand user needs(
c) To define the scope of testing(d) All of the above

85 The process starting with the terminal modules is called
a) Top-down integration(b) Bottom-up integration
c) None of the above(d) Module integration

86 What is the difference between testing software developed by contractor outside your country, versus testing software developed by a contractor within your country?
a) Does not meet people needs(b) Cultural difference
c) Loss of control over reallocation of resources(d) Relinquishments of control

87 How much testing is enough
a) This question is impossible to answer
b) The answer depends on the risks for your industry, contract and special requirements(
c) The answer depends on the maturity of your developers
d) The answer should be standardized for the software development industry

88 Cyclomatic Complexity method comes under which testing metho(d)
(a) White box(b) Black box(c) Green box(d) Yellow box

89 Which of these can be successfully tested using Loop Testing methodology?
(a) Simple Loops(b) Nested Loops(c) Concatenated Loops(d) All of the above

90 When a new testing tool is purchased, it should be used first by:
a) A small team to establish the best way to use the tool
b) Everyone who may eventually have some use for the tool(
c) The independent testing team
d) The vendor contractor to write the initial scripts

91 Retesting modules connected to the program or component after a change has been made?
a)Full Regression Testing b)Unit Regression
c)Regional Regression d)Retesting.

92 Requirements Specification, Planning, Test case Design, Execution, Bug Reporting & Maintenance This Life Cycle comes Under
a)SDLC b)STLC c)SQLC d)BLC

93 It provides a set of levels and an assessment model, and presents a set of recommended practices that allow organizations to improve their testing processes.
a)TIM (Testing Improving Model) b)TMM (Testing Maturity Model) c)TQM(Total Quality Management) d) None of the above

94 This type of test include, how well the user will be able to understand and interact with the system?
(a)Usability Testing b)User Acceptance Testing c)Alpha Testing d)Beta Testing.

95 Conducted to validate that the application, database, and network they may be running on can handle projected volumes of users and data effectively. The test is conducted jointly by developers, tester , DBAs and network associates after the system Testing called as
a)Functional Testing b)Stress/Load Testing c)Recovery Testingd)Integration Testing

96 Beta testing will be done by
(a)Developer b)User c)Tester d) None of the above

97 Which Software Development Life cycle model will require to start Testing Activities when starting development activities itself
(a)Water falls model b)Spiral Model c)V-model d)Linear model

98 The defects captured are analyzed for complexity type, security,, impact and other things is called as
(a)Test Strategy b)Test Planning c)Test Analysis d)Test Execution

99 _____ of user needs to be considered in testing the accessibility features of the system
(a)Demographics b)Crypto graphics c)Both a & b d)None of the these

100 Which are required internationalization requirements?
(a)Interface Testing b) Usability Testing c)Globalization Testing d)Performance Testing

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Sl.No. 1539 SUBJECT CODE: 34612302

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E -DEGREE EXAMINATIONS- FEB - 2022
ELECTRICAL AND ELECTRONICS ENGINEERING
THIRD SEMESTER
ELECTRIC CIRCUIT ANALYSIS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What are the merits of DC over AC circuits?

2 Write the applications of circuit analysis.

3 Write the formula for finding I_L by using thevenin's theorem.

4 Which theorem is used to find the maximum power for a linear?

5 Define mutual inductance.

6 Write the equation for maximum power absorption

7 What is meant by negative sequence component?

8 Define positive phase sequence.

9 Draw the DC response of R-L-C circuit and the response curve.

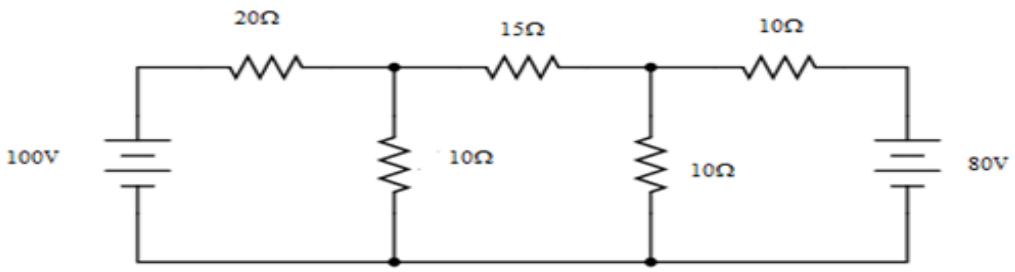
10 Write the boundary conditions for the inductance.

PART-B (5 x 16 = 80)

11 a. Derive the RMS value and form factor of sinusoidal waveforms.

OR

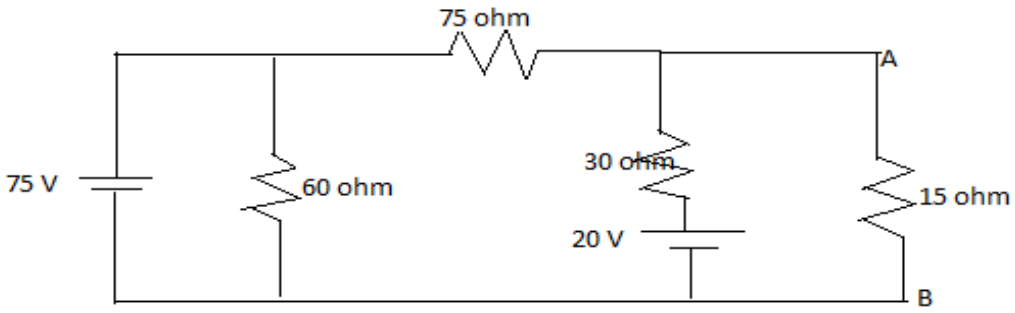
b. Find the currents I_1, I_2, I_3 and the voltages V_a and V_b in the network of figure by using nodal analysis.



(P.T.O)

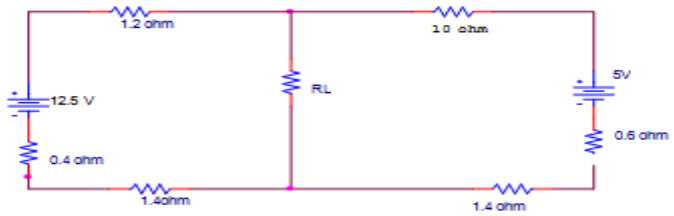
12 a.

(a)Find the voltage across the 15 ohm resistor by using Norton's theorem



OR

b. For the circuit of the fig find the value R_L for maximum power delivered to it. Calculate also the maximum load power. (16)



13 a. i) Derive the Q-factor of parallel resonance circuit.

ii) One RLC circuit has R= 30 Ω, L=40 mH and C= 50 μ F. Find the resonant frequency Under resonant conditions, Calculate the current and voltage drops across the R, L, and C if applied voltage is 120 V.

OR

b. A series circuit consisting of a 12 Ω resistor, 84.4 μF capacitor and a variable inductor is connected to a 100V, 50 cycle source.

a)For the condition of resonance, determine the inductance current and voltage drop across the inductor,

b) determine the inductance current and the voltage drop across the inductor when this voltage drop is a maximum,

14 a. i) Explain three phase power measurement by 2 wattmeter method and determine the power factor equation

ii) Two wattmeter method is used to measure power in a 3 phase load, the wattmeter readings are 400 W and -35 W .Calculate

i) total active power

ii) power factor and

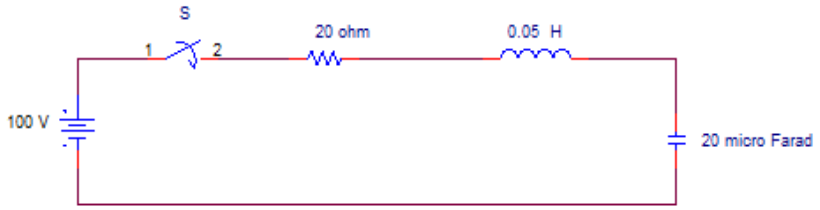
iii) reactive power

OR

b. a) Derive the expression for 3 wire star connected unbalanced load. .
b) Derive the expression for 4 wire star connected unbalanced load.

15 a.

The circuit shown in figure consists of resistance, inductance and capacitance in Series with a 100 V constant source. When the switch is closed at t = 0, find the Current transient.



OR

b. Draw the sinusoidal response of R-L circuit and determine the current equation.

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Sl.No. 1542 SUBJECT CODE: 34415703

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
MECHANICAL ENGINEERING
SEVENTH SEMESTER
MECHATRONICS

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What are the components of feedback control system?
2 State various applications shift register.
3 What are the applications of thermistors?
4 How to measure velocity?
5 Write the special functions carried by the general purpose registers of 8086.
6 What is polling?
7 Define PLC.
8 Write the simple program using EXAMINE IF OPEN (XIO) INSTRUCTION.
9 Mention the stages in designing a mechatronics system.
10 What are two stroke engines?

PART-B (5 x 16 = 80)

11 a. Explain briefly about Measurement system with a neat sketch.

OR

b. What is sequential controller? Explain the microprocessor based controller operates a washing machine.

12 a. How a Tachogenerator is used to measure the angular velocity.

OR

b. a. Explain about the selection of sensors? b. Explain about the signal processing

13 a. Discuss the function of following (i) General purpose registers. (ii)Timing and control unit (iii) Stack pointer

OR

b. How can a DAC be interfaced with µp8085? Discuss with a neat sketch.

14 a. Explain the digital I/O modules with neat diagram.

OR

b. With neat diagram explain the converting relay logic diagram to ladder logic diagram with one example

15 a. Explain the design aspects of pick and place robot.

OR

b. Explain the operation and design of washing machine control.

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Sl.No. 1540 **Sub. Code: 34115503**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E DEGREE EXAMINATION - FEB -2022
COMPUTER SCIENCE AND ENGINEERING
Fifth Semester
ENVIRONMENTAL SCIENCE AND ENGINEERING
(Candidates admitted under 2015 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. What are the impacts of deforestation?
2. What are the causes for soil erosion?
3. What is called an ecological succession?
4. Distinguish between food web and food chain.
5. What are the sources of water pollution?
6. What is solid waste management?
7. What is the significance of watershed management?
8. What is a nuclear holocaust?
9. What is meant by population explosion?
10. What are the causes of childhood death?

PART-B (5 x 16 = 80 Marks)

11.a) Write the problems that are faced by the natural resources in urbanization.

OR

b) Explain in detail about nuclear fission and nuclear fusion.

12.a) Discuss about carbon and nitrogen cycle.

OR

b) Discuss the hotspots of India.

13.a) What are the various ways to control air pollution?

OR

b) Discuss nuclear pollution and its effect.

14.a) Discuss in detail the energy and water problems in urban areas.

OR

b) Explain the effect and control of global warming.

15.a)Write a brief account in family welfare programmes training and development.

OR

b) Explain how the remote sensing satellites help in the study of environment.

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Sl.No.1541 **SUB. CODE 35012701**

VINAYAKA MISSION'S RESEARCH FOUNDATION, SALEM
(Deemed to be University)
B.E DEGREE EXAMINATION – FEB - 2022
SEVENTH SEMESTER
BUSINESS INTELLIGENCE AND ITS APPLICATIONS

Three Hours Maximum: 100 marks

SECTION - A

I. Answer ALL Questions (100 x 1 = 100)

1 What are databases that support OLTP?
A) OLAP B) OLTP C) A database D) An operational database

2 What is the manipulation of information to support decision making?
A) OLAP B) OLTP C) A database D) An operational database

3 Which of the following is inaccurate in reference to a database?
A) A collection of information B) Organized by logical structure
C) Accessed by physical structure D) None of the above

4 Which of the following uses a series of logically related two-dimensional tables or files to tore information in the form of a database?
A) Database B) Relational database
C) Data warehouse D) Database management system

5 Which of the following do you create first when creating a database?
A) Primary keys B) Foreign keys C) Data dictionary D) All of the above

6 What does a data dictionary contain?
A) Physical structure for the information B) Logical structure for the information
C) Physical properties for the information D) All of the above

7 What is a primary key of one file that appears in another file?
A) Foreign key B) Primary key C) Composite key D) None of the above

8 Which of the following can not be created without foreign keys?
A) Logical ties among various files B) Physical ties among various files C) Logical ties among various fields D) Physical ties among various fields

9 Which of the following is not supported by a data warehouse?
A) OLTP B) OLAP C) Dimensional views D) Any of the above

10 Which of the following are included in data-mining tools?
A) Query-and-reporting tools B) Intelligent agents
C) Multidimensional analysis tools D) All of the above

11 Which technology tools are normally used to support online transaction processing?
A) Databases B) Decision support systems
C) Word processing programs D) Spreadsheets

12 _____ is the manipulation of information to support decision making.
A) Online transaction processing B) Operational database
C) Online data warehouse D) Online analytical processing

13 Which of the following is supported by an operational database?
A) Online transaction processing B) Online analytical processing
C) Online checking D) Online research processing

p.t.o

14 We have been given access to the company's operational data, and have been asked to produce a report. We discover that some of the data we need are in an SQL server database while other needed data are in a separate Oracle database. This is an example of _____ .
A) dirty data B) inconsistent data C) non-integrated data D) a "wrong format" problem

15 An operational system is which of the following?
A) A system that is used to run the business in real time and is based on historical data.
B) A system that is used to run the business in real time and is based on current data.
C) A system that is used to support decision making and is based on current data.
D) A system that is used to support decision making and is based on historical data.

16 A star schema has what type of relationship between a dimension and fact table?
A) Many-to-many B) One-to-one
C) One-to-many D) All of the above.

17 A goal of data mining includes which of the following?
A. To explain some observed event or condition B. To confirm that data exists
C. To analyze data for expected relationships D. To create a new data warehouse

18 Data scrubbing is which of the following?
A. A process to reject data from the data warehouse and to create the necessary indexes
B. A process to load the data in the data warehouse and to create the necessary indexes
C. A process to upgrade the quality of data after it is moved into a data warehouse
D. A process to upgrade the quality of data before it is moved into a data warehouse

19 _____ is the act of detecting and correcting (or removing) inaccurate attributes or ecords
A) Data Scrubbing B) Data cleaning C) Data Profiling D) None of the above

20 _____ is a common word for anything real about which we want to store data.
a) Entity b) Abstract c) Cardinality d) Categories

21 This relationship defines the type of relationship between _____ participating entities.
a) Null b) One c) Two d) Three

22 The _____ Model is Designed by identifying the various entities.
a)Physical Model b) Conceptual Model c) Logical Model d) Entity Model

23 Physical data model will be different for different _____.
a) MYSQL b) DB2 c) Oracle d) RDBMS

24 Data presented is more subjective as compared to objective nature in a _____.
a) Logical Model b) Relational model c) Physical Model d) Data model

25 A_____ dimension is a data that is in dimension temperament but is present in a fact table.
a) Four b) Three c) Degenerate d) Multiple

26 A single dimension that is expressed differentially in a fact table with the usage of views is called a _____.
a) Role- playing Dimension b) Multi dimension c) Hybrid Dimension d) Two dimension

27 Star Schema consist of a large central table with _____ .
a) Redundancy b) no redundancy c)small redundancy d)Higher redundancy

28 20. A star query is a join between a fact table and a number of _____.
a) dimension tablesb) Two dimensional c) Three dimensional d) Four Dimensional

29 Give the key which is the substitution for natural primary key
a) Foreign key b) sub key c) subordinate key d) surrogate key

30 _____consists of a composite set of indicators used to address the overall health of business operation
a)data b)index c)indicators d)measure

p.t.o

31 The generic two-level data warehouse architecture includes which of the following?
a). At least one data mart
b) Data that can extracted from numerous internal and external sources
c) Near real-time updates
d) All of the above

32 Dimensional modeling is intuitive to business uses and delivers _____
a). slow query performance b)good quality c)fast query performance c). d)all of the above

33 . _____helps in building a robust database/data warehouse
a)data model b)cardinality c) snow flake schema d) star schema c).

34 The dimension attribute must be
a)verbose b)descriptive c)complete d)all the above

35 _____is a data that is dimension in temperament but is present in the fact table.
a)degenerate dimension b)rapidly changing dimension c)junk dimension d)role playing dimension

36 Reporting tool and ETL tool are the key components of ? A. ERP system B. BI solution C. CRM system D. None of these

37 The business benefits that BI offers such as a cloud BI solution can be easily changed is ?
A.Visibility B. Scalability C. ERP System D. Flexibility

38 In Business Intelligence some typical enterprise resource planning system comprise of?
A. Financial Management B. Order Management
C. Purchase Management D. All the above

39 PaaS stands for ?
A. platform-and-a-srvice B. platform –as-a-security C. platform-as-a-service

40 A balanced scorecard is a _____
a).Data marts b) Data metric
c)Business performance measurement d).Business performance method

41 An entity could have _____attributes.
a)single b)multiple c)double d)none

42 Diagrammatic representation of the data and the relationship between different entities is_____
a)dimensional table b)data model c)fact table d)schemas

43 Which may cause the physical data model to be quite different from the logical data model.
a)foreign key b)primary key c)physical consideration d)table specification

44 Entity relationship model makes use of _____ design technique.
a)de-normalization b)third normal form c)one normal form d)two normal form

45 _____is the first step towards building the data warehouse.
a)data model b)fact table c)meta data d)dimensional modeling

46 _____facts are facts where the SUM operator cannot be used to produce any meaningful results.
a)additive facts b)non additive facts c)semi additive facts d)factless facts

47 The dimension attribute must be
a)verbose b)descriptive c)complete d)all the above

48 List the approach for handling slowly changing dimension
a)over writing the history b)preserving the history c)preserving one or more versions of history d)all the above

p.t.o

49 From below _____ is facts and _____is dimension
a)customer details, time of travel b)number of ticket booked, origin city
c)destination city, mode of payment d)amount paid, number of tickets booked

50 How many types of schemas are there in dimensional model
a)one b)two c)three d)four

51 The dimensional tables form a_____ patters around the large central fact table
a)radial b)circle c)elliptical d)rectangle

52 The second phase of the dimensional modeling life cycle is_____
a)requirement gathering b)identify the facts c)identify the dimension d)identify the grain

53 which step is the important step in designing the dimensional model
a)identifying the grain b)choosing the right granularity c)identifying dimension d)identifying facts

54 Which features of fact table will help you to identify the fact tables.
a). The fact table will mostly contain numeric and additive value b)It contains at least two foreign keys c)It usually comprises vast number of records d)all the above

55 _____consists of a composite set of indicators used to address the overall health of business operation.
a)data b)index c)indicators d)measure

56 Which test is used for ensuring metric relevance to business
a) Smart b) specific c) measurable d) time bound

57 KPIs refers to
a) Knowledge Performance Indicators b) Key Performance Indicators
c) Key Primary Indicator d) Key Perfect Indicator

58 Which indicator reflects the possibility of achieving the target?
a) Lag indicator b) lead indicator c) both a and b d) none

59 Dimension that is shared between more than one fact tables is called
a) Role playing dimension b) junk dimension c) degenerate dimension d) conformed dimension

60 Give the key which is the substitution for natural primary key
a) Foreign key b) sub key c) subordinate key d) surrogate key

61 what are the types of enterprise reporting?
a). Unstructured data reports, structured data reports, semi-structured data reports
b). Schemas, Graph based data models, XML
c). Tabular reports, Matrix reports, List reports, chart reports, Gauge reports
d). None of above

62 How many steps are there in creating dashboard?
A) 1 B) 2 C) 3 D) 4

63 Dashboard eases _____ making
A)Decision B)Scorecard C.Both A) and B) D.None of the above

64 Dashboard is collection powerful _____ elements
a) Metric b) Graphical c)Non metric d)None of above

65 Scorecard commonly use
a) Symbols and icons b)Facts c)Hardware d)None of the above

p.t.o

66 What are the steps required for designing the balanced scorecard
1). clarify and translate vision and strategy
2). communicate and link strategic objectives and measures
3). plan ,set target and align strategic initiatives
4). enhance strategic feedback and learning
a)1 and 2 b)1 only c)All the above d)None of the above

67 _____is a business activity process monitoring
a) Dashboard b)Scoreboard c)Indicator d)All the above

68 _____ are graphical elements that give visual clues about performance
a) Dashboard b)Scoreboard c)Indicators d)All the above

69 Dashboard presents _____ information using graphical elements
a). Real time b). Run time c). Both real and run time d). None of the above

70 What is GUI?
a). Graphical user interface b). Graphical index interface
c). Graphical user index d). None of the above

71 Choose the correct statements
a). Balanced scorecard is a strategic planning and management tool
b). Balanced scorecard is a perspective address
c). Balanced scorecard is a network security
d). None of the above

72 The essence of conversion rate optimization is to get a _____
a). Minority of visitors b).)Majority of visitors c)Executives c). d)None of the above

73 _____ provides business transparency. a) data metrics b)query c)Enterprise reporting d)None of the above

74 _____ perspective addresses the question of how shareholders view the firm
a) Strategy map b)Initiatives c)Scorecard d)Finance

75 _____is what the organisations do to achieve their targets and thereby their objectives.
a) Strategy map b)Initiatives c)Scorecard d)Finance

76 Maximum numbers of indicators are used in _____
a). Scorecard b)Dashboard c)Charts d)None of the above

77 Performance analysis is used for
a). Uncover opportunities in organisation b). For creation of data metrics c). Divisional reports d). None of the above

78 Expand BSC
a). Business security cord b). Balanced scorecard c)Backend security card d) None of above

79 Expand DSS
a). Decision support system b). Data support system c). Data secured system d). None of the above

80 Expansion of DSS ?
A. Data Support System B. Digital Suppor t System
C. Decision Support System D. Dimensional System Support

81 The convenience of being able to work?
A. Modem workability B. Mobile workability
C. Machine workability D. Management workability

p.t.o

82 The information is transmitted wirelessly to mobile devices and it also generally involves third –party members in the network, data security is called ?
A. Telecome Security B. Transmission Security C. Technical Security D. Transverse Security

83 The source Data stay on centralized servers rather than on individual mobile devices is called?
A. Data Security B. Data Server C. Device Security D. Device Support

84 The ever –improving data management practices and through new technologies that together comprise what is now called ?
A. SSD B. SDS C. DSS D. DDS

85 The decision initiated by the end – user gives inputs through the mobile device and can ask for information from a central server –based system is called ?
A. push reporting B. Pull reporting C. Push recording D. Pull recording

86 ETL stands for ?
A). A. Extract Transform Load B. Entity Transmission Load
C. Enterprise Transformation Load D. Extract Transmission Load

87 ROI stands for ?
A. Rights On their Inventory B. Revenue On their Inventory
C. Return On their Investment D. Return Of the Intrest

88 Examples of cloud computing is Web based email service are ? A. Hotmail B. Yahoo !Mail C. Gmail D. All the above

89 SaaS stands for ?
A. software- and-a-security B. software –as-a-service
C. system-and-a-security D. scalability-and –a-security

90 PaaS stands for ? .
A. platform-and-a-srvice B. platform –as-a-security
C. platform-as-a-service D. platform-as-a-system

91 Mobile workability and 24x7 connectivity are the two major offerings that became its major selling points of ?
A. DSS B. Mobility C. Scalability D. Cloud computing

92 In BI mobility timeline connectivity should be ?
A. Redundant and security B. Reliable and secure
C. Robust and Secure D. Robust and Reliable

93 In Business Intelligence some typical enterprise resource planning system comprise of ?
A. Financial Management B. Order Management
C. Purchase Management D. All the above

94 Among the vendors SAP was one such vendor which came out with SAP Business Warehouse in the year ?
A. 1997 B. 1991 C. 1987 D.1995

95 MCOS stands for ?
A. Multilevel Component Of System B. Multiple Components One System .
C. Multiple Component One Source D. None of the above

96 The business benefits that BI offers such as a cloud BI solution can be easily changed is ? Visibility B. Scalability C. ERP System D. Flexibility

97 The expansion of ERP stands for?
A. Enterprise Resource Planning B. Extended Resource Planning
C. Enterprise Reporting planning D. Executive Resource Planning

98 Give the expansion of CRM?
A. Customer Relationship Management B. Computing Relationship Management
C. Customer Resource Management D. Customer Relationship Marketing

99 The needs of the organization that BI supports in the meetings of SAP are? A. Reliability and scalability B. Sales and Marketing C. Analytics and Reporting D. Consistency and Reliability

100 To further enhance the ERP package with BI capabilities ,SAP came up with ?
A. SAP Business Warehouse B. BI solutions C. CRM System D. ETL tool

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Sl.No. 1537 SUBJECT CODE: 35015501

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
FIFTH SEMESTER
MOBILE COMPUTING

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What are the classifications of Wireless Networks?

2 What are the applications of mobile computing?

3 What are the two types of COA?

4 List out the Internet Layer Protocols.

5 List the important supplementary services offered by GSM.

6 What are the goals of GPRS?

7 What are the advantages of ad hoc networks?

8 List the types of communication in MANET.

9 List out various Mobile Operating Systems.

10 Draw the structure of Mobile Commerce.

PART-B (5 x 16 = 80)

11 a. Explain the structure of Mobile Computing Application

OR

b. Explain Space, Frequency, Code & Time division Multiplexing in detail

12 a. Express brief account of route optimization in Mobile IP.

OR

b. Explain IP-in-IP, Minimal IP and GRE encapsulation methods.

13 a. Explain the use of GSM in mobile telecommunication?

OR

b. Explain the concept of blue tooth architecture?

14 a. Explain DSR Routing Protocol in detail.

OR

b. Explain the various security attacks on VANET.

15 a. Write short notes on Android SDK.

OR

b. Discuss the component of WAP architecture and its application environment

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Sl.No. 1538 SUBJECT CODE: 34412503

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
MECHANICAL ENGINEERING
FIFTH SEMESTER
HYDRAULICS AND PNEUMATICS SYSTEMS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define viscosity index.
2 What are the four primary functions of hydraulic fluid?
3 List the advantages of PD pumps.
4 Write down various styles of cylinder mounting.
5 State the functions of Intensifier in the press circuit.
6 List any four advantages of using pneumo-hydraulic circuits
7 Why a lubricator be used in pneumatic system
8 What is a bistable flip –flop?
9 What is meant by step counter?
10 List the major units of a PLC.

PART-B (5 x 16 = 80)

11 a. Discuss about the properties of fluids.

OR

b. Discuss physical characteristics of hydraulic fluids.

12 a. Explain the working of piston pumps and discharge rates (swash plate type).

OR

b. Explain compound relief valve with a neat sketch.(b). Explain counter balance valve with a neat sketch.

13 a. Give any two application circuits employing accumulator for different purposes

OR

b. Draw a hydraulic circuit for the operation of a hydraulic press and explain.

14 a. Explain with neat sketch the electrical control of a regenerative cycle?

OR

b. What wall – attachment theory is as applied in fluidics? Also illustrate the wall – attachment phenomenon?

15 a. Explain with neat sketch of button bleed automatic retraction circuit and explain its operation?

OR

b. Design and develop a sequential circuit using cascade method for the following Sequence A+ B+ A- B-.

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Sl.No. 1533 SUBJECT CODE: 35015402

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
FOURTH SEMESTER
SYSTEM SOFTWARE

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define compiler and interpreter.

2 What is the name of X and L register in SIC machine and also specify its use.

3 Write the steps required to translate the source program to object program.

4 What is meant by external references?

5 What are relative (relocative) loaders?

6 Give the difference between linking loader and linkage editors into the memory.

7 What is meant by positional parameters?

8 How the macro is processed using two passes?

9 What are called tokens?

10 Name some of text editors.

PART-B (5 x 16 = 80)

11 a. Explain in detail about RISC machines

OR

b. List out the different types of system software and explain it.

12 a. Briefly discuss about program relocation concept of machine dependent assembler features.

OR

b. Explain MASM assembler with an example program.

13 a. Write the algorithm for linking loader and explain it.

OR

b. Explain in detail about the MS – DOS linker.

14 a. Illustrate the following with an example
a. Conditional Macro Expansion. b. Keyword Macro parameters

OR

b. Explain the following:
a) Macro Processor b)Macro Definition c) Macro Invocation d) Macro Expansion

15 a. Give a brief notes about the structure of editor.

OR

b. What are the phases in performing editing process? Explain in detail.

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Sl.No. 1536 SUBJECT CODE: 35316805

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E -DEGREE EXAMINATIONS - FEB-2022
BIOMEDICAL ENGINEERING
EIGHTH SEMESTER
ELECTIVE – VIRTUAL INSTRUMENTATION

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define WAP.

2 Give some of recent technologies used for instrumentation.

3 State G- programming rules.

4 What are the components involved in LABVIEW dialog box?

5 Write down the four properties for selection of transducer.

6 How do we select sensors for different applications?

7 Write down the advantages offering current loop.

8 What is the use of PCI interface?

9 What is ODCS?

10 Write down the various protocol structures used to design VI factory.

PART-B (5 x 16 = 80)

11 a. Explain the stages involved in engineering of products using virtual instrument with a neat schematic diagram.

OR

b. Explain conventional VI & also list out advantages of LABVIEW.

12 a. Explain data flow programming with suitable example.

OR

b. Explain debugging techniques and its types.

13 a. With sketches explain the ADC architecture types.

OR

b. Explain the following: RTD and strain gauge.

14 a. Explain the stages involved in data reception process using GPIB with a neat schematic diagram.

OR

b. Explain in detail about RS422 & RS485.

15 a. Elaborate distributed multiplatform control system with lab view.

OR

b. How timed loop used in different applications in lab view?

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Sl.No.1534 **Sub. Code:35016305**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING

Third Semester

DATABASE MANAGEMENT SYSTEMS

(Candidates admitted under 2016 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Mention the functions of a database administrator.
2. Differentiate procedural and non procedural language.
3. What is sub query?
4. What is a trigger?
5. What is first normal form/
6. What about smaller schemas?
7. What is average response time?
8. What is meant by log-based recovery?
9. Distinguish primary index and secondary index.
10. How does pipelining improve query evaluation efficiency?

PART-B (5 x 16 = 80 Marks)

11.a) List out the functional components of Data base management system. Explain in detail.

OR

b) Draw the three schema architecture of database systems and explain in detail.

12.a) Explain in detail about DDL commands and DML commands with example.

OR

b) Briefly explain about join query and its types with example.

13.a) Write short notes on: (i) First normal form (ii) Second normal form.

OR

b) Briefly explain about fourth normal form.

14.a) Explain about time stamp based concurrency control protocol.

OR

b) Explain the methods used to prevent the deadlock.

15.a) What is the use of an index structure? Explain the concept of ordered indices.

OR

b) Explain the following: (i) Sequential file organization (ii) Clustering file organization.

*****

Sl.No. 1535 **Sub. Code: 34412603**

VINAYAKA MISSIONS RESEARCH FOUNDATION

(Deemed to be University)

B.E. DEGREE EXAMINATION - FEB - 2022

Sixth Semester

MECHANICAL ENGINEERING

DESIGN OF TRANSMISSION SYSTEMS

(Candidates admitted under 2012 Regulations –CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. State law of Belting.
2. What are the various stresses induced in a wire rope?
3. List out the main types of gear tooth failure.
4. AGMA‘ stands for what?
5. How bevel gears are classified?
6. What is irreversibility in worm gears?
7. Define progression ratio.
8. What is the function of spacers in a gearbox?
9. Write down the properties required of the material used as a friction surface.
10. Distinguish between wet and dry operation of clutches.

PART-B (5 x 16=80 Marks)

11. a) Design a belt driven to transmit 20kW at 720 r.p.m. to aluminum rolling machine, the speed ratio being 3. Diameter of rolling machine pulley is 1.2m. The distance between the pulleys is 3m.

OR

b) Design a V- belt drive to the following specifications;

Power to be transmitted = 7.5 KW	Speed of driving wheel = 1440 r.p.m.
Speed of driven wheel = 400 r.p.m.	Diameter of driving wheel = 300mm.
Centre distance = 1000mm.	Service = 16 hours / day.

12. a) A parallel helical gear set consists of a 19-teeth pinion driving a 57-teeth gear. The pinion has a left-hand helix angle of 20^{o}, a normal pressure angle of 14 1/2 ^{o}, and a normal diametral pitch of 0.4 teeth/mm. Find:

i) The normal, transverse, and axial circular pitches.

ii) The transverse module and the transverse pressure angle.

iii) The pitch diameter of the two gears.

(P.T.O)

OR

b) A pair of helical gears subject to moderate shock loading is to transmit 30 KW at 1500 r.p.m. of the pinion. The speed reduction ratio is 4 and the helix angle is 20^o. The service is continuous and the teeth are 20^o FD in the normal plane. For the gear life of 10,000 hours, design the gear drive.

13. a) A pair of straight bevel gears has a velocity ratio of 2:1. The pitch circle diameter of the pinion is to 80 mm at the large end of the tooth. A 5KW power is supplied to the pinion, which rotates at 800r.p.m. The face width is 40 mm and the pressure angle is 20^o . Calculate the tangential, radial and axial components of the resultant force acting on the pinion.

OR

b) Design a straight bevel gear drive between two shafts at right angles to each other. Speed of the pinion shaft is 360 r.p.m. and the speed of the gear wheel shaft is 120 r.p.m. Pinion is of steel and wheel of cast iron. Each gear is expected to work 2 hours/ day for 10 years. The drive transmits 9.37KW.

14. a) A six speed gear box is to provide a speed range of 160 r.p.m to 500 r.p.m. Draw the speed diagram and the kinematic layout of the gear box. Find the number of teeth on all gears. Calculate number of teeth in each gear wheel and sketch the arrangement of gear box.

OR

b) A nine speed gearbox is required to give output speed ranging from 100 r.p.m. to 600 r.p.m. The input power is 4 kW at 1000 r.p.m. Draw the structural diagram and the kinematic arrangement of gear. Also calculate the percentage deviation of the obtainable speeds from the calculated ones.

15. a) Explain with a neat sketch the working of a single plate clutch. Derive an equation for the torque transmitted by the single plate clutch.

OR

b) A car engine has its rated output of 12KW. The maximum torque developed is 100 N-m. The clutch used is of single plate type having two active surfaces. The axial pressure is not to exceed $85KN/M^2$. The external diameter of the friction plate is 1.25 times the internal diameter. Determine the dimensions of the friction plate and the axial force exerted by the springs. Coefficient of friction = 0.3.

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Sl.No. 1537 SUBJECT CODE: 35015501

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
FIFTH SEMESTER
MOBILE COMPUTING

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What are the classifications of Wireless Networks?

2 What are the applications of mobile computing?

3 What are the two types of COA?

4 List out the Internet Layer Protocols.

5 List the important supplementary services offered by GSM.

6 What are the goals of GPRS?

7 What are the advantages of ad hoc networks?

8 List the types of communication in MANET.

9 List out various Mobile Operating Systems.

10 Draw the structure of Mobile Commerce.

PART-B (5 x 16 = 80)

11 a. Explain the structure of Mobile Computing Application

OR

b. Explain Space, Frequency, Code & Time division Multiplexing in detail

12 a. Express brief account of route optimization in Mobile IP.

OR

b. Explain IP-in-IP, Minimal IP and GRE encapsulation methods.

13 a. Explain the use of GSM in mobile telecommunication?

OR

b. Explain the concept of blue tooth architecture?

14 a. Explain DSR Routing Protocol in detail.

OR

b. Explain the various security attacks on VANET.

15 a. Write short notes on Android SDK.

OR

b. Discuss the component of WAP architecture and its application environment

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Sl.No. 1538 SUBJECT CODE: 34412503

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
MECHANICAL ENGINEERING
FIFTH SEMESTER
HYDRAULICS AND PNEUMATICS SYSTEMS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define viscosity index.
2 What are the four primary functions of hydraulic fluid?
3 List the advantages of PD pumps.
4 Write down various styles of cylinder mounting.
5 State the functions of Intensifier in the press circuit.
6 List any four advantages of using pneumo-hydraulic circuits
7 Why a lubricator be used in pneumatic system
8 What is a bistable flip –flop?
9 What is meant by step counter?
10 List the major units of a PLC.

PART-B (5 x 16 = 80)

11 a. Discuss about the properties of fluids.

OR

b. Discuss physical characteristics of hydraulic fluids.

12 a. Explain the working of piston pumps and discharge rates (swash plate type).

OR

b. Explain compound relief valve with a neat sketch.(b). Explain counter balance valve with a neat sketch.

13 a. Give any two application circuits employing accumulator for different purposes

OR

b. Draw a hydraulic circuit for the operation of a hydraulic press and explain.

14 a. Explain with neat sketch the electrical control of a regenerative cycle?

OR

b. What wall – attachment theory is as applied in fluidics? Also illustrate the wall – attachment phenomenon?

15 a. Explain with neat sketch of button bleed automatic retraction circuit and explain its operation?

OR

b. Design and develop a sequential circuit using cascade method for the following Sequence A+ B+ A- B-.

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Sl.No. 1535 **Sub. Code: 34412603**

VINAYAKA MISSIONS RESEARCH FOUNDATION

(Deemed to be University)

B.E. DEGREE EXAMINATION - FEB - 2022

Sixth Semester

MECHANICAL ENGINEERING

DESIGN OF TRANSMISSION SYSTEMS

(Candidates admitted under 2012 Regulations –CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. State law of Belting.
2. What are the various stresses induced in a wire rope?
3. List out the main types of gear tooth failure.
4. AGMA' stands for what?
5. How bevel gears are classified?
6. What is irreversibility in worm gears?
7. Define progression ratio.
8. What is the function of spacers in a gearbox?
9. Write down the properties required of the material used as a friction surface.
10. Distinguish between wet and dry operation of clutches.

PART-B (5 x 16=80 Marks)

11. a) Design a belt driven to transmit 20kW at 720 r.p.m. to aluminum rolling machine, the speed ratio being 3. Diameter of rolling machine pulley is 1.2m. The distance between the pulleys is 3m.

OR

b) Design a V- belt drive to the following specifications;

Power to be transmitted = 7.5 KW	Speed of driving wheel = 1440 r.p.m.
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Centre distance = 1000mm.	Service = 16 hours / day.

12. a) A parallel helical gear set consists of a 19-teeth pinion driving a 57-teeth gear. The pinion has a left-hand helix angle of 20^{o}, a normal pressure angle of 14 1/2 ^{o}, and a normal diametral pitch of 0.4 teeth/mm. Find:

i) The normal, transverse, and axial circular pitches.

ii) The transverse module and the transverse pressure angle.

iii) The pitch diameter of the two gears.

(P.T.O)

OR

b) A pair of helical gears subject to moderate shock loading is to transmit 30 KW at 1500 r.p.m. of the pinion. The speed reduction ratio is 4 and the helix angle is 20^o. The service is continuous and the teeth are 20^o FD in the normal plane. For the gear life of 10,000 hours, design the gear drive.

13. a) A pair of straight bevel gears has a velocity ratio of 2:1. The pitch circle diameter of the pinion is to 80 mm at the large end of the tooth. A 5KW power is supplied to the pinion, which rotates at 800r.p.m. The face width is 40 mm and the pressure angle is 20^o . Calculate the tangential, radial and axial components of the resultant force acting on the pinion.

OR

b) Design a straight bevel gear drive between two shafts at right angles to each other. Speed of the pinion shaft is 360 r.p.m. and the speed of the gear wheel shaft is 120 r.p.m. Pinion is of steel and wheel of cast iron. Each gear is expected to work 2 hours/ day for 10 years. The drive transmits 9.37KW.

14. a) A six speed gear box is to provide a speed range of 160 r.p.m to 500 r.p.m. Draw the speed diagram and the kinematic layout of the gear box. Find the number of teeth on all gears. Calculate number of teeth in each gear wheel and sketch the arrangement of gear box.

OR

b) A nine speed gearbox is required to give output speed ranging from 100 r.p.m. to 600 r.p.m. The input power is 4 kW at 1000 r.p.m. Draw the structural diagram and the kinematic arrangement of gear. Also calculate the percentage deviation of the obtainable speeds from the calculated ones.

15. a) Explain with a neat sketch the working of a single plate clutch. Derive an equation for the torque transmitted by the single plate clutch.

OR

b) A car engine has its rated output of 12KW. The maximum torque developed is 100 N-m. The clutch used is of single plate type having two active surfaces. The axial pressure is not to exceed $85KN/M^2$. The external diameter of the friction plate is 1.25 times the internal diameter. Determine the dimensions of the friction plate and the axial force exerted by the springs. Coefficient of friction = 0.3.

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Sl.No. 1536 SUBJECT CODE: 35316805

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E -DEGREE EXAMINATIONS - FEB-2022
BIOMEDICAL ENGINEERING
SIXTH SEMESTER
ELECTIVE – VIRTUAL INSTRUMENTATION

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define WAP.

2 Give some of recent technologies used for instrumentation.

3 State G- programming rules.

4 What are the components involved in LABVIEW dialog box?

5 Write down the four properties for selection of transducer.

6 How do we select sensors for different applications?

7 Write down the advantages offering current loop.

8 What is the use of PCI interface?

9 What is ODCS?

10 Write down the various protocol structures used to design VI factory.

PART-B (5 x 16 = 80)

11 a. Explain the stages involved in engineering of products using virtual instrument with a neat schematic diagram.

OR

b. Explain conventional VI & also list out advantages of LABVIEW.

12 a. Explain data flow programming with suitable example.

OR

b. Explain debugging techniques and its types.

13 a. With sketches explain the ADC architecture types.

OR

b. Explain the following: RTD and strain gauge.

14 a. Explain the stages involved in data reception process using GPIB with a neat schematic diagram.

OR

b. Explain in detail about RS422 & RS485.

15 a. Elaborate distributed multiplatform control system with lab view.

OR

b. How timed loop used in different applications in lab view?

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Sl.No.1534 **Sub. Code:35016305**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
Third Semester
DATABASE MANAGEMENT SYSTEMS
(Candidates admitted under 2016 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Mention the functions of a database administrator.
2. Differentiate procedural and non procedural language.
3. What is sub query?
4. What is a trigger?
5. What is first normal form/
6. What about smaller schemas?
7. What is average response time?
8. What is meant by log-based recovery?
9. Distinguish primary index and secondary index.
10. How does pipelining improve query evaluation efficiency?

PART-B (5 x 16 = 80 Marks)

11.a) List out the functional components of Data base management system. Explain in detail.

OR

b) Draw the three schema architecture of database systems and explain in detail.

12.a) Explain in detail about DDL commands and DML commands with example.

OR

b) Briefly explain about join query and its types with example.

13.a) Write short notes on: (i) First normal form (ii) Second normal form.

OR

b) Briefly explain about fourth normal form.

14.a) Explain about time stamp based concurrency control protocol.

OR

b) Explain the methods used to prevent the deadlock.

15.a) What is the use of an index structure? Explain the concept of ordered indices.

OR

b) Explain the following: (i) Sequential file organization (ii) Clustering file organization.

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Sl.No. 1533 SUBJECT CODE: 35015402

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
FOURTH SEMESTER
SYSTEM SOFTWARE

(Candidates admitted under 2016 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define compiler and interpreter.

2 What is the name of X and L register in SIC machine and also specify its use.

3 Write the steps required to translate the source program to object program.

4 What is meant by external references?

5 What are relative (relocative) loaders?

6 Give the difference between linking loader and linkage editors into the memory.

7 What is meant by positional parameters?

8 How the macro is processed using two passes?

9 What are called tokens?

10 Name some of text editors.

PART-B (5 x 16 = 80)

11 a. Explain in detail about RISC machines

OR

b. List out the different types of system software and explain it.

12 a. Briefly discuss about program relocation concept of machine dependent assembler features.

OR

b. Explain MASM assembler with an example program.

13 a. Write the algorithm for linking loader and explain it.

OR

b. Explain in detail about the MS – DOS linker.

14 a. Illustrate the following with an example
a. Conditional Macro Expansion. b. Keyword Macro parameters

OR

b. Explain the following:
a) Macro Processor b)Macro Definition c) Macro Invocation d) Macro Expansion

15 a. Give a brief notes about the structure of editor.

OR

b. What are the phases in performing editing process? Explain in detail.

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Sl.No. 1530 SUBJECT CODE: 35315604

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
BIO MEDICAL ENGINEERING
SIXTH SEMESTER
NANOTECHNOLOGY IN MEDICINE

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define nanotechnology

2 State the structures and bonds of nanomaterials.

3 List out the particle size determination methods.

4 List out the semiconducting nanoparticles.

5 Mention some properties of MEMS materials

6 List out the difference between MEMS and NEMS.

7 How the nanomaterial's regulated?

8 What is a neuro-electronic interface?

9 State the advantages of nanobiotechnology.

10 What is the need for nano sensors?

PART-B (5 x 16 = 80)

11 a. Describe in detail about lithography and its types.

OR

b. Explain the structure of the C60 molecule and its stability.

12 a. With a suitable diagram discuss about TEM method of particle analysis.

OR

b. What is dip-pen lithography? Explain how protein arrays can be created by this technique.

13 a. Explain PVD method for MEMS fabrication.

OR

b. Briefly explain about photolithography, and etching processes.

14 a. Give a detailed insight on cancer surgery.

OR

b. Explain in detail on a neuro interface application.

15 a. Give a detailed insight on genes and gene delivery system.

OR

b. Describe about physical and chemical synthesis methods and explain any one method in detail with required images.

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Sl.No. 1532 **Sub. Code: 35015502**

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.E DEGREE EXAMINATION - FEB-2022

COMPUTER SCIENCE AND ENGINEERING

Fifth Semester

AUTOMATA THEORY AND COMPILER DESIGN

(Candidates admitted under 2015 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

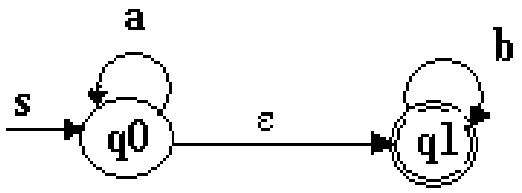
Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. What are the needs of epsilon in NFA?
2. List out the closure properties of regular sets.
3. Give the importance of CNF.
4. Write short notes about two way infinite tapes
5. What is a symbol table?
6. Mention about the types of parsers.
7. What are the three kinds of intermediate representation?
8. What is the purpose of DAG?
9. Define bootstrapping.
10. What is the use of control stack?

PART-B (5 x 16 = 80 Marks)

11.a) Construct NFA without ε moves from the NFA given in the diagram?



OR

b) Explain in detail about construction of FA from Regular expression.

12.a) Let G be the grammar S -> aB/bA , A -> a/aS/bAA, B -> b/bS/aBB for the string aaabbabbba find a

a) Left most derivation b) Right most derivation c) Parse tree

OR

b) Construct the GNF grammar for the following.

S→AA / a

A→ SS / b

13.a) Describe in detail about specification of tokens.

OR

b) Discuss Operator Precedence Parsing in detail.

14.a) Write in detail about specification of a simple type checker.

OR

b) How would you generate the intermediate code for the Boolean expression?

15.a) Explain about the algorithm for code generation.

OR

b) Explain in detail about the peephole optimization.

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Sl.No. 1527 SUBJECT CODE: 35012602

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB- 2022
COMPUTER SCIENCE AND ENGINEERING
SIXTH SEMESTER
ARTIFICIAL INTELLIGENCE

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define an Ideal rational agent.

2 List the basic elements that are to be included in problem definition.

3 Differentiate BFS & DFS.

4 Define Local Search Algorithms

5 Define Propositional Logic.

6 What is Theory of inference?

7 What is the need for utility theory in uncertainty?

8 State the design issues that affect the learning element.

9 List the various types of smoothing technique and say few words about each.

10 Define bigram model.

PART-B (5 x 16 = 80)

11 a. Explain the Simple reflex agents and Model-based reflex agents.

OR

b. Discuss in detail about various example problems in the problem solving approach?

12 a. Explain in detail the Greedy best-first search?

OR

b. Discuss in detail about Genetic algorithm.

13 a. Explain briefly about the forward chaining with example?

OR

b. Explain the concept of categories and objects in knowledge engineering with example

14 a. Explain in detail dynamic Bayesian networks.

OR

b. Explain Generalization in Reinforcement Learning in detail.

15 a. Explain the process of Information retrieval system evaluation and refinements in detail.

OR

b. Explain the concept of Learning probabilities for machine translation with example

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Sl.No. 1526 SUBJECT CODE: 34716404

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E -DEGREE EXAMINATIONS - FEB-2022
ELECTRICAL AND ELECTRONICS ENGINEERING
FOURTH SEMESTER
MICROCONTROLLER & APPLICATIONS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What is the position of the Stack Pointer after the PUSH instruction?

2 How clock signal is generated in 8086? What is the maximum internal clock frequency of 8086?

3 What are the features used in mode 2 in8255?

4 Mention the use of modem control unit in 8251.

5 What is the importance of special function registers in 80851?

6 What is the role of Timer/counter register in 8051?

7 Write a program using 8051 assembly language to change the date 55H stored in the lower byte of the data pointer register to AAH using rotate instruction.

8 Name the unconditional jump instruction of 8051 microcontroller.

9 Define Interfacing.

10 Differentiate between LED & LCD displays.

PART-B (5 x 16 = 80)

11 a. Describe the logical and branching instruction set of 8086 with examples.

OR

b. Explain in detail about Assembler Directives in 8086.

12 a. With a neat diagram explain the function of 8253.

OR

b. With neat diagram explain the D/A Convertor using 8086.

13 a. Explain in detail about the special function registers available in 8051

OR

b. Difference between Microprocessor & Microcontroller.

14 a. Describe the various addressing modes in 8051.

OR

b. Write an assembly language program for two 8 bit subtraction and Division in 8051.

15 a. Discuss on ADC interfacing with a neat diagram.

OR

b. With illustration explain interfacing a microcontroller to a DC Motor.

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SI.No.1528 **Sub.Code: 34416803**

VINAYAKA MISSIONS RESEARCH FOUNDATION, SALEM

B.E DEGREE EXAMINATIONS –FEB-2022

MECHANICAL ENGINEERING

Eighth Semester

ELECTIVE-LEAN MANUFACTURING SYSTEMS

(Candidates admitted under 2016 Regulations-CBCS)

Time: Three hours Maximum:100Marks

Answer **ALL** questions

PART – A (10 x 2 = 20 marks)

1. What are called as wastes, according to lean manufacturing system?
2. What is meant by batch production?
3. What are the advantages of 5S?
4. Define Talk time.
5. What is meant by CSM?
6. What are the benefits of Kanban system?
7. What is meant by automation?
8. What is meant by variation reduction?
9. Mention the events in Kaizen training.
10. What is meant by daily management system?

PART – B (5 x 16 = 80 marks)

11. a) Explain the origin of lean production system in detail.

OR

b) Enumerate on Toyota production system.

12. a) Explain the pillars of TPM with illustrations.

OR

b) Explain the procedure for creating standard work.

13. a) Explain the significance of pull system over the push system in lean Manufacturing.

OR

b) What is meant by production leveling? Explain in detail.

14. a) What is meant by Jidoka? Explain in detail.

OR

b) Explain the different types of Poka Yoke system.

15. a) Explain the advantages and limitations in implementing Kaizen.

OR

b) Discuss the benefits of Hoshin planning system.

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Sl.No. 1531 SUBJECT CODE: 34412403

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- FEB- 2022
MECHANICAL ENGINEERING
FOURTH SEMESTER
MANUFACTURING TECHNOLOGY - II

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Classify the metal cutting process.

2 State any two properties of cutting fluid.

3 List out the principle parts of a lathe.

4 How various speeds are obtained in a lathe?

5 What is cutting ratio with reference to a shaper?

6 What is meant by boring operation?

7 Define broach.

8 Define helix angle.

9 Specify the uses of internal grinders.

10 How grinding wheels are designated?

PART-B (5 x 16 = 80)

11 a. Discuss the nomenclature of a single point cutting tool with sketches.

OR

b. What are the commonly used tool materials? Explain their properties .

12 a. Sketch and explain different methods of taper turning operations.

OR

b. Explain the working principle of Swiss type automatic lathe with suitable sketch.

13 a. Illustrate the construction and working principle of double housing planner.

OR

b. Explain the nomenclature of twist drill and define the various elements of twist drill.

14 a. Explain the working of horizontal broaching machine.

OR

b. Explain the gear planning and gear shaving process with neat sketch.

15 a. Describe the working principle of horizontal spindle reciprocating surface Grinders with neat sketch.

OR

b. Explain the various types of abrasives used in grinding wheels.

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Sl.No. 1525 **Sub. Code: 34116401**

VINAYAKA MISSIONS RESEARCH FOUNDATION, SALEM
(Deemed to be University)

B.E DEGREE EXAMINATIONS – FEB-2022

MECHANICAL ENGINEERING
Fourth Semester

NUMERICAL METHODS

(Candidates admitted under 2016 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Which has faster convergence either Gauss-Seidel or *Gauss–Jacobi method*?
2. By *Gauss elimination method*, solve $x+y=2,\ 2x+3y=5$
3. When *Bessel's* formula is to be used?
4. Write the second order divided difference formula.
5. How will you improve the accuracy in the *Trapezoidal Rule*?
6. Evaluate $\int_1^2 \frac{dx}{1+x^2}$ by *Trapezoidal rule* with $h=0.5$.
7. Write down the *Runge-Kutta* formula of fourth order to solve $\frac{dy}{dx}=f(x,y)$ with $y(x_o)=y_o$
8. Given $y'=1-y$ and $y(0)=0$. Find $y(0.1)$ by *Modified Euler method.*
9. Write a finite difference scheme for solving $U_{xx}+U_{yy}=f(x,y)$
10. Classify $u_{xx}+4u_{yy}+3u_{xy}+4u_y+3u_x=0$

PART-B (5 x 16 = 80 Marks)

11.a) Solve the following system of equations by using *Gauss elimination* method.

$$10x-2y+3z=23$$
$$2x+10y-5z=-33$$
$$3x-4y+10z=41$$

OR

b) Find the inverse of a matrix $\begin{bmatrix}2&1&1\\3&2&3\\1&4&9\end{bmatrix}$ by *Gauss Jordan* method.

12.a) Given the data

x	0	1	2	3	4
y	2	3	12	35	78

Find the cubic polynomial of x, using *Newton's Backward Interpolation formula.*

OR

b) Apply *Lagrange's* formula inversely, to obtain the root of the equation $f(x)=0$ given that $f(0)=-4,\ f(1)=1,\ f(3)=29$ and $f(4)=52$.

(P.T.O)

13.a) Find the first, second and third derivatives of $f(x)$ at $x = 1.5$ if

x	1.5	2.0	2.5	3.0	3.5	4.0
$f(x)$	3.375	7.000	13.625	24.000	38.875	59.000

OR

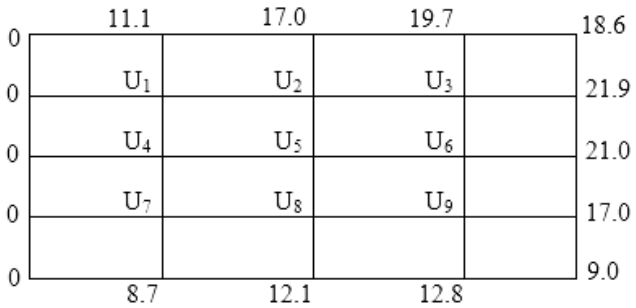
b) Evaluate $\int_0^1 \frac{\sin x}{x} dx$, by a *Gaussian* three – point quadrature formula.

14.a) Using Taylor series method, find approximate values of y and z corresponding to $x = 0.1$, given that $y(0) = 2, z(0) = 1$ by solving $\frac{dy}{dx} = x + z$ and $\frac{dz}{dx} = x - y^2$.

OR

b) Using *Modified Euler method*, Find $y(0.1), y(0.2)$, given $\frac{dy}{dx} = x^2 + y^2, y(0) = 1.$

15.a) Solve $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$ at the nine mesh points of the square given below. The values of u at the boundary are specified in the figure.



OR

b) Solve the *Poisson equation* $\nabla^2 u = -10(x^2 + y^2 + 10)$ over the square mesh with sides $x = 0, y = 0, x = 3, y = 3$ and $u = 0$ on the boundary. Assume mesh length $h = 1$ unit.

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Sl.No. 1529 SUBJECT CODE: 34112103

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
CSE
FIRST SEMESTER
ENGINEERING PHYSICS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What are the differences between laser light and ordinary light?

2 What is meant by direct conversion.

3 Write the condition for total internal reflection.

4 Define sensor.

5 What are the Miller indices?

6 Give the atomic radius and packing factor for FCC

7 How sound waves are classified?

8 What is meant by intensity level of sound?

9 What are the various steps involved in NDT.

10 Give the merits of Ultrasonic Flaw Detector Method.

PART-B (5 x 16 = 80)

11 a. Explain the applications of lasers in engineering and industrial fields.

OR

b. Explain the modes of vibrations of CO_2 molecule. Describe the construction and working of CO_2 laser with necessary diagram.

12 a. Explain the classification of fibers on the basis of (i) material (ii) number of modes (iii) refractive index.

OR

b. Give the principle of an fibre optic sensor. Explain the construction and working of displacement sensor.

13 a. Explain the seven crystal systems with neat sketches and examples.

OR

b. Derive an expression for‘d’ spacing of a cubic crystal in terms of lattice constant and Miller indices.

14 a. Write short notes on Loudness, Pitch, Decibel.

OR

b. How do you maintain good acoustics in a hall.

15 a. Describe the X-ray Fluoroscopy technique of non destructive testing and write its applications.

OR

b. i) Distinguish between X-ray Radiography and X-ray Fluoroscopy. ii) Give the merits and demerits of X-ray Radiography

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Sl.No. 1522 **Sub. Code: 34212504**

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.E. DEGREE EXAMINATION -FEB-2022

Fifth Semester

CIVIL ENGINEERING

DESIGN OF STEEL STRUCTURE-I

(Candidates admitted from 2012 batch under 2012 Regulation –CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Write the five series of rolled steel I-sections manufactured in India.
2. Define 'high tension bolts'.
3. What is shear lag effect?
4. Write the use of lug angle in tension connection.
5. What are the types of compression members?
6. Define effective length of column.
7. What is simple bending equation?
8. Write the interaction formula for the beams subjected to biaxial bending.
9. What is the purpose of a purlin in a roof truss?
10. Which section is best suited for a purlin?

PART-B (5 x 16=80 Marks)

11. a) Design a lap joint to connect two plates of thickness 12mm and 10mm respectively to carry a factored load of 120 kN. Use 20 mm diameter 4.6 grade bolts and Fe410 grade steel. Also find the efficiency of the joint.

OR

b) A tie in a truss consists of a pair of angles ISA 90 mm x 60mm x10 mm welded on either side of a gusset plate 16 mm thick through the longer legs. Design the welded joint if the permissible stresses in angles and fillet welds are 150 MPa and 108 MPa respectively.

12. a) Design a tension members to carry a factored tensile load of 400 kN. The 3.5 m long tension member is connected to a gusset plate 12 mm thick with one line of 20 mm diameter bolts of grade 4.6 Use Fe 410 grade steel.

OR

b) Find the tensile load carrying capacity of 2 ISA 75 mm x 75 mm x8 mm placed back to back of a 12 mm thick gusset plate using a single row of 4 nos. 16 mm diameter bolts at a distance of 40 mm from the toe of the angle. Take pitch = 50 mm and end distance =30 mm. The length of the member is 4m. Use Fe410 grade steel.

(p.t.o)

13. a) Design a steel column of rolled steel I section to carry an axial load of 650 kN. The column is 3.5 m long and it is effectively held in position at both ends but restrained against one end only. Take yield stress in steel as 250 N/mm^2.

OR

b) Design a laced column for an axial load of 1500 kN with an effective span of 8m has one end fixed and the other end hinged. Use channels for main members and an angle for lacing bars.

14. a) Design a simply support laterally restrained beam of effective span 5.5m carrying a factored point load of intensity 75 kN at the mid span. Design an appropriate section using Fe410 grade steel.

OR

b) Design a laterally unsupported beam of effective span 6 m, carrying a factored bending moment of 300 kNm and factored shear force of 150kN. Use Fe 410 grade steel.

15. a) Explain briefly the following

i) Different types of roof truss

ii) Different components of roof truss

iii) Mention the steps involved in the design of roof truss.

OR

b) Design a purlin using the following data.

Spacing of roof trusses = 4m c/c

Spacing of purlin = 2 m c/c

Pitch of roof = ¼

Span of the roof =12 m

Wind load intensity from roof sheets = 160 N/m^2

Vertical load from roof sheets = 1500 N/m^2

Use I section.

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Sl.No. 1522 **Sub. Code: 34212504**

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.E. DEGREE EXAMINATION -FEB-2022

Fifth Semester

CIVIL ENGINEERING

DESIGN OF STEEL STRUCTURE-I

(Candidates admitted from 2012 batch under 2012 Regulation –CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Write the five series of rolled steel I-sections manufactured in India.
2. Define 'high tension bolts'.
3. What is shear lag effect?
4. Write the use of lug angle in tension connection.
5. What are the types of compression members?
6. Define effective length of column.
7. What is simple bending equation?
8. Write the interaction formula for the beams subjected to biaxial bending.
9. What is the purpose of a purlin in a roof truss?
10. Which section is best suited for a purlin?

PART-B (5 x 16=80 Marks)

11. a) Design a lap joint to connect two plates of thickness 12mm and 10mm respectively to carry a factored load of 120 kN. Use 20 mm diameter 4.6 grade bolts and Fe410 grade steel. Also find the efficiency of the joint.

OR

b) A tie in a truss consists of a pair of angles ISA 90 mm x 60mm x10 mm welded on either side of a gusset plate 16 mm thick through the longer legs. Design the welded joint if the permissible stresses in angles and fillet welds are 150 MPa and 108 MPa respectively.

12. a) Design a tension members to carry a factored tensile load of 400 kN. The 3.5 m long tension member is connected to a gusset plate 12 mm thick with one line of 20 mm diameter bolts of grade 4.6 Use Fe 410 grade steel.

OR

b) Find the tensile load carrying capacity of 2 ISA 75 mm x 75 mm x8 mm placed back to back of a 12 mm thick gusset plate using a single row of 4 nos. 16 mm diameter bolts at a distance of 40 mm from the toe of the angle. Take pitch = 50 mm and end distance =30 mm. The length of the member is 4m. Use Fe410 grade steel.

(p.t.o)

13. a) Design a steel column of rolled steel I section to carry an axial load of 650 kN. The column is 3.5 m long and it is effectively held in position at both ends but restrained against one end only. Take yield stress in steel as 250 N/mm^2.

OR

b) Design a laced column for an axial load of 1500 kN with an effective span of 8m has one end fixed and the other end hinged. Use channels for main members and an angle for lacing bars.

14. a) Design a simply support laterally restrained beam of effective span 5.5m carrying a factored point load of intensity 75 kN at the mid span. Design an appropriate section using Fe410 grade steel.

OR

b) Design a laterally unsupported beam of effective span 6 m, carrying a factored bending moment of 300 kNm and factored shear force of 150kN. Use Fe 410 grade steel.

15. a) Explain briefly the following

i) Different types of roof truss

ii) Different components of roof truss

iii) Mention the steps involved in the design of roof truss.

OR

b) Design a purlin using the following data.

Spacing of roof trusses = 4m c/c

Spacing of purlin = 2 m c/c

Pitch of roof = ¼

Span of the roof =12 m

Wind load intensity from roof sheets = 160 N/m^2

Vertical load from roof sheets = 1500 N/m^2

Use I section.

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Sl.No. 1517 SUBJECT CODE: 35016405

VINAYAKA MISSIONS RESEARCH FOUNDATION

(Deemed to be University)

B.E.DEGREE EXAMINATIONS- FEB - 2022

COMPUTER SCIENCE AND ENGINEERING

FOURTH SEMESTER

COMPUTER NETWORKS

(Candidates admitted under 2016 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define Data communication. Give its uses
2 List out different types of Modems.
3 Specify the types of errors.
4 Write a note on Frame Relay
5 Define IP address.
6 Define datagram.
7 Define error control.
8 Define QoS.
9 Define POP.
10 List out the 2 components of SMTP.

PART-B (5 x 16 = 80)

11 a. With a neat sketch explain OSI layers.

OR

b. Explain in detail circuit switching

12 a. Illustrate the concept of Ethernet 802.3 in detail.

OR

b. Briefly explain the concept of CRC with example.

13 a. Explain IP addressing method.

OR

b. Explain in detail Unicast Routing Protocols.

14 a. Explain congestion control in detail.

OR

b. Answer Briefly: i) End-to-End Delivery ii) Addressing iii)Multiplexing

15 a. Explain the concept of WWW in detail.

OR

b. List out the protocols in application layer, explain with example.

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Sl.No.1524 **Sub. Code: 35016302**

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.E. DEGREE EXAMINATION – FEB – 2022

COMPUTER SCIENCE AND ENGINEERING

Third Semester

DIGITAL PRINCIPLES AND SYSTEM DESIGN

(Candidates admitted under 2016 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Why binary number system is used in digital systems?
2. Which codes are called as self complementing code?
3. What is combinational circuit? Give some examples.
4. List the applications of multiplexers.
5. What are the different types of shift register?
6. Write the characteristic table of JK flip-flop.
7. When does race condition occur?
8. Give the advantages of ASM chart.
9. What is meant by the term 'reading' with reference to memories?
10. Mention the full custom ASIC design.

PART-B (5 x 16 = 80 Marks)

11.a) Draw the 2 level OR – AND Network F = (C+D) (A'+BC) (C'+D') (A+B+C').

OR

b) Simplify the logic function of using the Quine – Mc cluskey minimization technique
Y = (A,B,C,D) = ∑ m(0,1,,37,8,9,11,15)

12.a) Describe the Magnitude Comparator in detail.

OR

b) Implement the following functions with an 4:1 multiplexer.

13.a) Design and explain the working of a 4-bit ripple counter with a neat diagram.

OR

b) Design a 3 bit binary UP/DOWN counter with a direction control M. Use JK Flip-Flops.

14.a) Briefly explain the pulse mode asynchronous sequential circuit.

OR

b) What are the steps in the analysis and design of asynchronous sequential circuits? Explain with an example.

15.a) Explain the sequential programmable devices.

OR

b) Discuss in detail about the RAM and ROM.

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Sl.No.1523 **Sub. Code: 35015504**

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.E DEGREE EXAMINATION - FEB -2022
COMPUTER SCIENCE AND ENGINEERING
Fifth Semester
COMPUTER GRAPHICS

(Candidates admitted under 2015 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Formulate governing equation of circle.
2. What do you infer from PHIGS?
3. Give short notes on active and passive transformations.
4. Name the Various types of Polygon clipping.
5. What is Transformation? Give the steps involved in 3D transformation.
6. Define Polygon mesh.
7. What is Ambient light?
8. What are subtractive colors?
9. Explain animation.
10. How is Julia sets created?

PART-B (5 x 16 = 80 Marks)

11.a) i)Differentiate Raster scan and Random scan systems.
ii) Explain the Various Input Devices.

OR

b) Generalize the characteristics of the following devices.
(i)Refresh cathode ray tube (ii)Liquid Crystal Displays.

12.a) Clip the given line A(1,3) B(4,1) against a window P(2,2) ,Q(5,2), R(5,4),S(2,4) using Liang Barsky line Clipping algorithm. Also explain window to viewport coordinate transformation.

OR

b) i) Illustrate about Nicholl-Lee-Nicholl line clipping
ii) Examine about point clipping

13.a) Find the points on the Bezier curve which has starting and ending points P0 (2, 3) and P3 (4,-3) and is controlled by P1 (5,6) and P2 (7,1) for u=0.9.

OR

b) With suitable examples **discuss** the following
i) Reflection and Scaling
ii) Shearing.

14.a) Demonstrate various method of color selection.

OR

b) Compare and contrast between RGB and CMY color models.

15.a) Demonstrate how images can be created using fractals.

OR

b) Explain the Ray tracing process with an example.

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Sl.No. 1520 SUBJECT CODE: 35012610

VINAYAKA MISSIONS RESEARCH FOUNDATION

(Deemed to be University)

B.E -DEGREE EXAMINATIONS- FEB - 2022

COMPUTER SCIENCE AND ENGINEERING

SIXTH SEMESTER

ADVANCED JAVA PROGRAMMING

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What is Multithreading? List out the stages involved in thread life cycle .

2 What is a dynamic reflexive class?

3 What is Telnet?

4 What is a connection factory?

5 What are stubs and skeletons in RMI?

6 Differentiate pass-by-value and pass-by-reference.

7 What is JDBC?

8 Define applet.

9 When do we use executeQuery() and executeUpdate() methods of the Statement object?

10 What is a stateful session bean?

PART-B (5 x 16 = 80)

11 a. Write a program to handle reading and writing content on to a file.

OR

b. Explain the advantages and disadvantages of swing over AWT in detail.

12 a. Write an Echo server and Echo client application program to display the message from client to server.

OR

b. Explain in detail about telnet application.

13 a. .Discuss in detail about Object serialization.

OR

b. Discuss the applications of CORBA programming.

14 a. Distinguish between applet and servlet.

OR

b. What is an applet? Explain how applets are used in net based applications.

15 a. Briefly explain the concept of entity beans and its advantages and disadvantages.

OR

b. What is Transaction? Explain Transaction attributes and Bean Managed Transactions.

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Sl.No. 1518 SUBJECT CODE: 34415702

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
MECHANICAL ENGINEERING
SEVENTH SEMESTER
HYDRAULIC AND PNEUMATIC SYSTEMS

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What are the types of fluid power system?
2 Name any one linear actuator from electrical system.
3 List the advantages of PD pumps.
4 Where the fluidic control system preferred than other control systems?
5 What is the function of unloading valve?
6 How single acting cylinder is are retracted?
7 Why is extension stroke faster than retraction stroke in regenerative circuit?
8 Where the synchronization required?
9 Why fluid power systems preferred over other systems?
10 What is the meaning of the troubleshooting?

PART-B (5 x 16 = 80)

11 a. Discuss about the various hydraulic fluids.

OR

b. Explain various selection criteria of a hydraulic fluid in detail.

12 a. Explain the working of piston pumps and discharge rates (swash plate type).

OR

b. Explain with neat block diagram air filter control circuit for double acting cylinder.

13 a. Explain the flow control valve with a neat sketch and mention the location of the floe control valves in the hydraulic circuits.

OR

b. Sketch and explain the working of sequencing valve with a application circuit.

14 a. Give any two application circuits employing accumulator for different purposes.

OR

b. Draw a hydraulic circuit for the operation of a hydraulic press and explain.

P.T.O

15 a. Design a system in which cylinder A is used to clamp the work piece, cylinder B is used for punching and cylinder C removes the work piece from the station using the cascade method. The cylinder sequence is A^+, B^+, B^-, A^-, C^+, C^-

OR

b. Consider an automatic drilling machine. The complete cycle as follows: cylinder A extends to clamp the work piece, then cylinder B extends to drill a hole and then retracts. Cylinder A then retracts to unclamp the work piece. Design a control circuit applying the step-counter method. The circuit provided the start valve to avoid continuous cycling.

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Sl.No. 1521 SUBJECT CODE: 34412608

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
MECHANICAL ENGINEERING
SIXTH SEMESTER
ENGINEERING METROLOGY AND MEASUREMENTS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define correction.

2 Define interchangeability.

3 State any two limitations of sine bar.

4 State the use of laser micrometer.

5 Name the device used for measurement of roundness.

6 Define degree of fullness.

7 What are the different types of geometrical tests conducted on machine tools?

8 What are the advantages of digital devices?

9 What are the advantages of electronic instruments?

10 What are the advantages of computer backplane?

PART-B (5 x 16 = 80)

11 a. Classify the measuring instruments and explain any two types of the instruments with neat sketches.

OR

b. With suitable example explain the difference between accuracy and precision.

12 a. Discuss briefly about the use of Sine bar with a neat sketch.

OR

b. Explain the working principle of Angle Decker with a neat sketch.

13 a. Explain Roundness measuring spindles with neat diagram.

OR

b. Narrate the working principle of tool makers microscope with a neat sketch.

14 a. Explain the laser equipment for alignment testing in detail.

OR

b. Explain the concept of digital devices.

15 a. Explain briefly analog signal processing and reference.

OR

b. Explain about information interface.

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Sl.No:1519 **Sub. Code: 34112601**

VINAYAKA MISSIONS RESEARCH FOUNDATION

(Deemed to be University)

B.E.DEGREE EXAMINATIONS- FEB – 2022

Sixth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

MATHEMATICAL MODELLING AND SIMULATION

(Candidates admitted under 2012 Regulation –CBCS)

Time: Three hours **Maximum: 100 marks**

Answer ALL questions

PART – A (10 x 2 = 20 Marks)

1. State about cell array.
2. What is modelling?
3. Give an example of relational operators.
4. Define “mpower”
5. What is the purpose of plot?
6. Define polar plots.
7. What is meant by inverse matrix?
8. Define sample variance.
9. Define FFT.
10. Sketch the filter structure.

PART-B (5 x 16=80 Marks)

11. a). Give a detailed note about MATLAB. List out the different tools of MATLAB.

OR

b). Explain briefly about (i) script files (ii) M files

12. a). Discuss briefly about debugging MATLAB programs.

OR

b). Explain about Top-Down design techniques with suitable flow chart.

13. a). With suitable example describe how to set a 2D plot?

OR

b). State and explain about polynomial functions with example.

14. a).Define definite integral, List the different integration pairs with example.

OR

b). Explain briefly about statistical functions of MATLAB.

15. a). Write the suitable MATLAB program to plot the frequency response to FIR 1 and FIR 2.

OR

b). Explain about digital demodulation technique with suitable chart.

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Sl.No. 1530 SUBJECT CODE: 35315604

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
BIO MEDICAL ENGINEERING
SIXTH SEMESTER
NANOTECHNOLOGY IN MEDICINE

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define nanotechnology

2 State the structures and bonds of nanomaterials.

3 List out the particle size determination methods.

4 List out the semiconducting nanoparticles.

5 Mention some properties of MEMS materials

6 List out the difference between MEMS and NEMS.

7 How the nanomaterial's regulated?

8 What is a neuro-electronic interface?

9 State the advantages of nanobiotechnology.

10 What is the need for nano sensors?

PART-B (5 x 16 = 80)

11 a. Describe in detail about lithography and its types.

OR

b. Explain the structure of the C60 molecule and its stability.

12 a. With a suitable diagram discuss about TEM method of particle analysis.

OR

b. What is dip-pen lithography? Explain how protein arrays can be created by this technique.

13 a. Explain PVD method for MEMS fabrication.

OR

b. Explain in detail about any one type of NEMS with suitable diagram.

14 a. Give a detailed insight on cancer surgery.

OR

b. Explain in detail on a neuro interface application.

15 a. Give a detailed insight on genes and gene delivery system.

OR

b. Describe about physical and chemical synthesis methods and explain any one method in detail with required images.

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VINAYAKA MISSIONS RESEARCH FOUNDATION

B.E DEGREE EXAMINATION - FEB-2022

COMPUTER SCIENCE AND ENGINEERING

Fifth Semester

AUTOMATA THEORY AND COMPILER DESIGN

(Candidates admitted under 2015 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

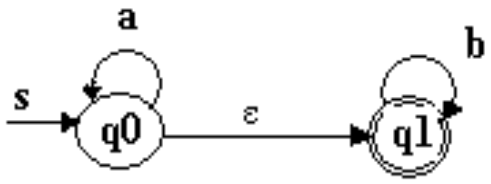
Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. What are the needs of epsilon in NFA?
2. List out the closure properties of regular sets.
3. Give the importance of CNF.
4. Write short notes about two way infinite tapes
5. What is a symbol table?
6. Mention about the types of parsers.
7. What are the three kinds of intermediate representation?
8. What is the purpose of DAG?
9. Define bootstrapping.
10. What is the use of control stack?

PART-B (5 x 16 = 80 Marks)

11.a) Construct NFA without ε moves from the NFA given in the diagram?



OR

b) Explain in detail about construction of FA from Regular expression.

12.a) Let G be the grammar S -> aB/bA , A -> a/aS/bAA, B -> b/bS/aBB for the string aaabbabbba find a

a) Left most derivation b) Right most derivation c) Parse tree

OR

b) Construct the GNF grammar for the following.

S→AA / a

A→ SS / b

13.a) Describe in detail about specification of tokens.

OR

b) Discuss Operator Precedence Parsing in detail.

14.a) Write in detail about specification of a simple type checker.

OR

b) How would you generate the intermediate code for the Boolean expression?

15.a) Explain about the algorithm for code generation.

OR

b) Explain in detail about the peephole optimization.

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Sl.No. 1511 SUBJECT CODE: 34712303

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
ECE
THIRD SEMESTER
DIGITAL ELECTRONICS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define SOP and POS.

2 State the principle of duality.

3 Why ECL logic is faster than TTL?

4 Which is the logic family meant for use in an industrial environment where electrical noise is high? Why?

5 What is EPROM?

6 What is PAL & PLA?

7 What is the advantage of master slave over JK –Flip-flop?

8 Define negative edge triggering.

9 Define races.

10 How many inputs can change simultaneously in an asynchronous sequential circuit? Justify.

PART-B (5 x 16 = 80)

11 a. Reduce the following function using K map technique and draw the equivalent diagram for the output function by using logic gates.
F(A,B,C,D)= π M (0,3,4,7,8,10,12,14) . d (2, 6)

OR

b. Simplify the following functions using K- map technique and draw the equivalent diagram for the output function by using logic gates.
i. F(A,B,C,D) = ∑ m(0,2,4,5,6,7,8,10,11,12,14,15)
ii. F(A,B,C,D) = B'C' + AB' + ABC' + AB'CD' + A'B'C'D + AB'CD

12 a. Explain the characteristics and operation of DTL family.

OR

b. Describe the OR/NOR implementation in ECL family and the salient features of ECL logic gate family.

13 a. Design a Binary to Gray Code converter and realize the output expression by using logic gates.

OR

b. Illustrate the design and functioning of a half subtractor and a full subtractor.

14 a. Using JK flip flops, design a synchronous counter which counts in the sequence 000,001,010,011,100,101,110,111,000

P.T.O

OR

b. Explain the types of ROM.

15 a. Design an asynchronous sequential circuit that has two in puts x1 and x2 and one output z. The output z=1 if x1 changes from 0 to 1,z=0 if x2 changes from 0 to 1, and z=0 otherwise. Realize the circuits using a) D-flip flop and b) JK flip flops.

OR

b. Briefly explain about the Pulse mode circuits.

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Sl.No. 1531 SUBJECT CODE: 34412403

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- FEB- 2022
MECHANICAL ENGINEERING
FOURTH SEMESTER
MANUFACTURING TECHNOLOGY - II

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Classify the metal cutting process.

2 State any two properties of cutting fluid.

3 List out the principle parts of a lathe.

4 How various speeds are obtained in a lathe?

5 What is cutting ratio with reference to a shaper?

6 What is meant by boring operation?

7 Define broach.

8 Define helix angle.

9 Specify the uses of internal grinders.

10 How grinding wheels are designated?

PART-B (5 x 16 = 80)

11 a. Discuss the nomenclature of a single point cutting tool with sketches.

OR

b. What are the commonly used tool materials? Explain their properties .

12 a. Sketch and explain different methods of taper turning operations.

OR

b. Explain the working principle of Swiss type automatic lathe with suitable sketch.

13 a. Illustrate the construction and working principle of double housing planner.

OR

b. Explain the nomenclature of twist drill and define the various elements of twist drill.

14 a. Explain the working of horizontal broaching machine.

OR

b. Explain the gear planning and gear shaving process with neat sketch.

15 a. Describe the working principle of horizontal spindle reciprocating surface Grinders with neat sketch.

OR

b. Explain the various types of abrasives used in grinding wheels.

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SI.No.1528 **Sub.Code: 34416803**

VINAYAKA MISSIONS RESEARCH FOUNDATION, SALEM

B.E DEGREE EXAMINATIONS –FEB-2022

MECHANICAL ENGINEERING

Eight Semester

ELECTIVE-LEAN MANUFACTURING SYSTEMS

(Candidates admitted under 2016 Regulations-CBCS)

Time: Three hours Maximum:100Marks

Answer **ALL** questions

PART – A (10 x 2 = 20 marks)

1. What are called as wastes, according to lean manufacturing system?
2. What is meant by batch production?
3. What are the advantages of 5S?
4. Define Talk time.
5. What is meant by CSM?
6. What are the benefits of Kanban system?
7. What is meant by automation?
8. What is meant by variation reduction?
9. Mention the events in Kaizen training.
10. What is meant by daily management system?

PART – B (5 x 16 = 80 marks)

11. a) Explain the origin of lean production system in detail.

OR

b) Enumerate on Toyota production system.

12. a) Explain the pillars of TPM with illustrations.

OR

b) Explain the procedure for creating standard work.

13. a) Explain the significance of pull system over the push system in lean Manufacturing.

OR

b) What is meant by production leveling? Explain in detail.

14. a) What is meant by Jidoka? Explain in detail.

OR

b) Explain the different types of Poka Yoke system.

15. a) Explain the advantages and limitations in implementing Kaizen.

OR

b) Discuss the benefits of Hoshin planning system.

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Sl.No.1524 **Sub. Code: 35016302**

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.E. DEGREE EXAMINATION – FEB – 2022

COMPUTER SCIENCE AND ENGINEERING

Third Semester

DIGITAL PRINCIPLES AND SYSTEM DESIGN

(Candidates admitted under 2016 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Why binary number system is used in digital systems?
2. Which codes are called as self complementing code?
3. What is combinational circuit? Give some examples.
4. List the applications of multiplexers.
5. What are the different types of shift register?
6. Write the characteristic table of JK flip-flop.
7. When does race condition occur?
8. Give the advantages of ASM chart.
9. What is meant by the term 'reading' with reference to memories?
10. Mention the full custom ASIC design.

PART-B (5 x 16 = 80 Marks)

11.a) Draw the 2 level OR – AND Network F = (C+D) (A'+BC) (C'+D') (A+B+C').

OR

b) Simplify the logic function of using the Quine – Mc cluskey minimization technique
Y = (A,B,C,D) = ∑ m(0,1,,37,8,9,11,15)

12.a) Describe the Magnitude Comparator in detail.

OR

b) Implement the following functions with an 4:1 multiplexer.

13.a) Design and explain the working of a 4-bit ripple counter with a neat diagram.

OR

b) Design a 3 bit binary UP/DOWN counter with a direction control M. Use JK Flip-Flops.

14.a) Briefly explain the pulse mode asynchronous sequential circuit.

OR

b) What are the steps in the analysis and design of asynchronous sequential circuits? Explain with an example.

15.a) Explain the sequential programmable devices.

OR

b) Discuss in detail about the RAM and ROM.

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Sl.No.1523 **Sub. Code: 35015504**

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.E DEGREE EXAMINATION - FEB -2022
COMPUTER SCIENCE AND ENGINEERING
Fifth Semester
COMPUTER GRAPHICS

(Candidates admitted under 2015 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Formulate governing equation of circle.
2. What do you infer from PHIGS?
3. Give short notes on active and passive transformations.
4. Name the Various types of Polygon clipping.
5. What is Transformation? Give the steps involved in 3D transformation.
6. Define Polygon mesh.
7. What is Ambient light?
8. What are subtractive colors?
9. Explain animation.
10. How is Julia sets created?

PART-B (5 x 16 = 80 Marks)

11.a) i)Differentiate Raster scan and Random scan systems.
ii) Explain the Various Input Devices.

OR

b) Generalize the characteristics of the following devices.
(i)Refresh cathode ray tube (ii)Liquid Crystal Displays.

12.a) Clip the given line A(1,3) B(4,1) against a window P(2,2) ,Q(5,2), R(5,4),S(2,4) using Liang Barsky line Clipping algorithm. Also explain window to viewport coordinate transformation.

OR

b) i) Illustrate about Nicholl-Lee-Nicholl line clipping
ii) Examine about point clipping

13.a) Find the points on the Bezier curve which has starting and ending points P0 (2, 3) and P3 (4,-3) and is controlled by P1 (5,6) and P2 (7,1) for u=0.9.

OR

b) With suitable examples **discuss** the following
i) Reflection and Scaling
ii) Shearing.

14.a) Demonstrate various method of color selection.

OR

b) Compare and contrast between RGB and CMY color models.

15.a) Demonstrate how images can be created using fractals.

OR

b) Explain the Ray tracing process with an example.

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Sl.No. 1522 SUBJECT CODE: 34212504

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
CIVIL ENGINEERING
FIFTH SEMESTER
DESIGN OF STEEL STRUCTURES-I

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What are the types of failures occur in riveted joint?

2 Write short notes on durability.

3 Define tension member.

4 What is meant by allowable stress?

5 What is meant by built up compression members?

6 How effective length of column is determined?

7 Define the term Beam

8 Write the short notes on vertical deflection

9 List out the common roof covering materials.

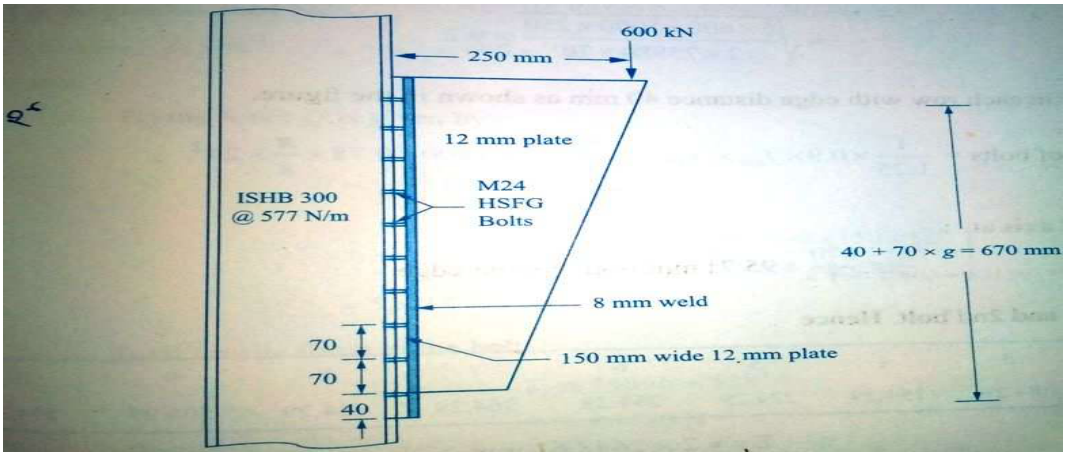
10 Define bearing stiffner

PART-B (5 x 16 = 80)

11 a. A tie member consists of two ISMC 250.the channels are connected on either side of 12mm thick gusset plate. Design the welded joint to develop the full strength of the tie. However the overlap is to

OR

b. A bracket is made by welding a 20mm thick,150mm wide plate to a 12mm thick plate as shown in figure, the thickness of fillet weld being 8mm.this is to be connected to the flange of column ISHB300@577 N/m. using M24 HSFG bolts of grade 8.8.design the bolted connection assuming coefficient of friction μ=0.48



12 a.

Design a single angle section for a tension member of a roof truss to carry a factored tensile force of 225KN.the member is subjected to the possible reversal of stress due to the action of wind.the length of

OR

b. Design a double angle tension member connected on each side of a 10mm thick gusset plate,to carry an axial factored load of 375KN.use 20mm black bolts.assume shop connection

13 a. Design a slab base for a column ISHB 300@577N/m carrying an axial factored load of 1000KN.M20 concrete is used for the foundation.Provide welded connection between column and base plate.

OR

b. An upper storey column ISHB 300@577N/m carries a factored load of 1200KN and a factored moment of 12KN-m.it is to be spliced with lower storey column ISHB 400@806 N/m.design a suitable splice.

14 a. Design a simply supported beam to carry a uniformly load of 68 KN. The Effective span of beam is 6 m. the effective length of compression flange of beam is also 6m. The ends are free from to rotate at the section

OR

b. A classroom is 5m x 13 m. It provides with 130 mm thick stone patties steel over a rolled steel beam spaced 3 m center to enter. A wearing coat of 25 mm thick cement concrete is provided over a160 mm thick lime concrete. The effective flange would be equal to be effective span of beam. The ends of beam shall not be free to rotate at bearing

Live load=4KN/2, Unit weight of concrete= 24KN/M3, Unit wt of lime concrete=18 KN/m3, unit wt of plain cement concrete= 24KN/m

15 a. A communication tower of 80 m height is proposed to be build over hill top of height 520 m with a gradient of 1 in 5. The horizontal approach distance is 2.8 km from the level ground. The tower is proposed at abu mount. Determine the design wind pressure.

OR

b. Design an I – section purlin to support galvanized corrugated iron sheet roof. The purlins are 1.25 m zpart over roof trusses spaced 5 m centre to centre. The roof surface has an inclination of 30 to the horizontal. The weight of corrugated iron sheet is 0.1331 kN/ m^2. The weight of fixtures etc. 0.053 kN/ m^2. The design wind pressure for medium permeability is 1.2 kN/ m^2 (outward) parallel to ridge

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Sl.No. 1521 SUBJECT CODE: 34412608

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
MECHANICAL ENGINEERING
SIXTH SEMESTER
ENGINEERING METROLOGY AND MEASUREMENTS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define correction.

2 Define interchangeability.

3 State any two limitations of sine bar.

4 State the use of laser micrometer.

5 Name the device used for measurement of roundness.

6 Define degree of fullness.

7 What are the different types of geometrical tests conducted on machine tools?

8 What are the advantages of digital devices?

9 What are the advantages of electronic instruments?

10 What are the advantages of computer backplane?

PART-B (5 x 16 = 80)

11 a. Classify the measuring instruments and explain any two types of the instruments with neat sketches.

OR

b. With suitable example explain the difference between accuracy and precision.

12 a. Discuss briefly about the use of Sine bar with a neat sketch.

OR

b. Explain the working principle of Angle Decker with a neat sketch.

13 a. Explain Roundness measuring spindles with neat diagram.

OR

b. Narrate the working principle of tool makers microscope with a neat sketch.

14 a. Explain the laser equipment for alignment testing in detail.

OR

b. Explain the concept of digital devices.

15 a. Explain briefly analog signal processing and reference.

OR

b. Explain about information interface.

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Sl.No. 1520 SUBJECT CODE: 35012610

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E -DEGREE EXAMINATIONS- FEB - 2022
CSE
SIXTH SEMESTER
ADVANCED JAVA PROGRAMMING

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What is Multithreading? List out the stages involved in thread life cycle

2 What is a dynamic reflexive class?

3 What is Telnet?

4 What is a connection factory?

5 What are stubs and skeletons in RMI?

6 Differentiate pass-by-value and pass-by-reference.

7 What is JDBC?

8 Define applet.

9 When do we use executeQuery() and executeUpdate() methods of the Statement object?

10 What is a stateful session bean?

PART-B (5 x 16 = 80)

11 a. Write a program to handle reading and writing content on to a file.

OR

b. Explain the advantages and disadvantages of swing over AWT in detail.

12 a. Write an Echo server and Echo client application program to display the message from client to server.

OR

b. Explain in detail about telnet application.

13 a. .Discuss in detail about Object serialization.

OR

b. Discuss the applications of CORBA programming.

14 a. Distinguish between applet and servlet.

OR

b. What is an applet? Explain how applets are used in net based applications.

15 a. Briefly explain the concept of entity beans and its advantages and disadvantages.

OR

b. What is Transaction? Explain Transaction attributes and Bean Managed Transactions.

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Sl.No:1519 **Sub. Code: 34112601**

VINAYAKA MISSIONS RESEARCH FOUNDATION

(Deemed to be University)

B.E.DEGREE EXAMINATIONS- FEB – 2022

Sixth Semester

ELECTRICAL AND ELECTRONICS ENGINEERING

MATHEMATICAL MODELLING AND SIMULATION

(Candidates admitted under 2012 Regulation –CBCS)

Time: Three hours **Maximum: 100 marks**

Answer ALL questions

PART – A (10 x 2 = 20 Marks)

1. State about cell array.
2. What is modelling?
3. Give an example of relational operators.
4. Define "mpower"
5. What is the purpose of plot?
6. Define polar plots.
7. What is meant by inverse matrix?
8. Define sample variance.
9. Define FFT.
10. Sketch the filter structure.

PART-B (5 x 16=80 Marks)

11. a). Give a detailed note about MATLAB. List out the different tools of MATLAB.

OR

b). Explain briefly about (i) script files (ii) M files

12. a). Discuss briefly about debugging MATLAB programs.

OR

b). Explain about Top-Down design techniques with suitable flow chart.

13. a). With suitable example describe how to set a 2D plot?

OR

b). State and explain about polynomial functions with example.

14. a).Define definite integral, List the different integration pairs with example.

OR

b). Explain briefly about statistical functions of MATLAB.

15. a). Write the suitable MATLAB program to plot the frequency response to FIR 1 and FIR 2.

OR

b). Explain about digital demodulation technique with suitable chart.

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Sl.No. 1518 SUBJECT CODE: 34415702

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
MECH
SEVENTH SEMESTER
HYDRAULIC AND PNEUMATIC SYSTEMS

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What are the types of fluid power system?
2 Name any one linear actuator from electrical system.
3 List the advantages of PD pumps.
4 Where the fluidic control system preferred than other control systems?
5 What is the function of unloading valve?
6 How single acting cylinder is are retracted?
7 Why is extension stroke faster than retraction stroke in regenerative circuit?
8 Where the synchronization required?
9 Why fluid power systems preferred over other systems?
10 What is the meaning of the troubleshooting?

PART-B (5 x 16 = 80)

11 a. Discuss about the various hydraulic fluids.

OR

b. Explain various selection criteria of a hydraulic fluid in detail.

12 a. Explain the working of piston pumps and discharge rates (swash plate type).

OR

b. Explain with neat block diagram air filter control circuit for double acting cylinder.

13 a. Explain the flow control valve with a neat sketch and mention the location of the floe control valves in the hydraulic circuits.

OR

b. Sketch and explain the working of sequencing valve with a application circuit.

14 a. Give any two application circuits employing accumulator for different purposes.

OR

b. Draw a hydraulic circuit for the operation of a hydraulic press and explain.

P.T.O

15 a. Design a system in which cylinder A is used to clamp the work piece, cylinder B is used for punching and cylinder C removes the work piece from the station using the cascade method. The cylinder sequence is A^+, B^+, B^-, A^-, C^+, C^-

OR

b. Consider an automatic drilling machine. The complete cycle as follows: cylinder A extends to clamp the work piece, then cylinder B extends to drill a hole and then retracts. Cylinder A then retracts to unclamp the work piece. Design a control circuit applying the step-counter method. The circuit provided the start valve to avoid continuous cycling.

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Sl.No. 1517 SUBJECT CODE: 35016405

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
FOURTH SEMESTER
COMPUTER NETWORKS

(Candidates admitted under 2016 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define Data communication. Give its uses
2 List out different types of Modems.
3 Specify the types of errors.
4 Write a note on Frame Relay
5 Define IP address.
6 Define datagram.
7 Define error control.
8 Define QoS.
9 Define POP.
10 List out the 2 components of SMTP.

PART-B (5 x 16 = 80)

11 a. With a neat sketch explain OSI layers.

OR

b. Explain in detail circuit switching

12 a. Illustrate the concept of Ethernet 802.3 in detail.

OR

b. Briefly explain the concept of CRC with example.

13 a. Explain IP addressing method.

OR

b. Explain in detail Unicast Routing Protocols.

14 a. Explain congestion control in detail.

OR

b. Answer Briefly: i) End-to-End Delivery ii) Addressing iii)Multiplexing

15 a. Explain the concept of WWW in detail.

OR

b. List out the protocols in application layer, explain with example.

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Sl.No. 1527 SUBJECT CODE: 35012602

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB- 2022
COMPUTER SCIENCE AND ENGINEERING
SIXTH SEMESTER
ARTIFICIAL INTELLIGENCE

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define an Ideal rational agent.

2 List the basic elements that are to be included in problem definition.

3 Differentiate BFS & DFS.

4 Define Local Search Algorithms

5 Define Propositional Logic.

6 What is Theory of inference?

7 What is the need for utility theory in uncertainty?

8 State the design issues that affect the learning element.

9 List the various types of smoothing technique and say few words about each.

10 Define bigram model.

PART-B (5 x 16 = 80)

11 a. Explain the Simple reflex agents and Model-based reflex agents?

OR

b. Discuss in detail about various example problems in the problem solving approach?

12 a. Explain in detail the Greedy best-first search?

OR

b. Discuss in detail about Genetic algorithm.

13 a. Explain briefly about the forward chaining with example?

OR

b. Explain the concept of categories and objects in knowledge engineering with example

14 a. Explain in detail dynamic Bayesian networks.

OR

b. Explain Generalization in Reinforcement Learning in detail.

15 a. Explain the process of Information retrieval system evaluation and refinements in detail.

OR

b. Explain the concept of Learning probabilities for machine translation with example

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Sl.No. 1526 SUBJECT CODE: 34716404

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E -DEGREE EXAMINATIONS - FEB-2022
ELECTRICAL AND ELECTRONICS ENGINEERING
FOURTH SEMESTER
MICROCONTROLLER & APPLICATIONS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What is the position of the Stack Pointer after the PUSH instruction?

2 How clock signal is generated in 8086? What is the maximum internal clock frequency of 8086?

3 What are the features used in mode 2 in8255?

4 Mention the use of modem control unit in 8251.

5 What is the importance of special function registers in 80851?

6 What is the role of Timer/counter register in 8051?

7 Write a program using 8051 assembly language to change the date 55H stored in the lower byte of the data pointer register to AAH using rotate instruction.

8 Name the unconditional jump instruction of 8051 microcontroller.

9 Define Interfacing.

10 Differentiate between LED & LCD displays.

PART-B (5 x 16 = 80)

11 a. Describe the logical and branching instruction set of 8086 with examples.

OR

b. Explain in detail about Assembler Directives in 8086.

12 a. With a neat diagram explain the function of 8253.

OR

b. With neat diagram explain the D/A Convertor using 8086.

13 a. Explain in detail about the special function registers available in 8051

OR

b. Difference between Microprocessor & Microcontroller.

14 a. Describe the various addressing modes in 8051.

OR

b. Write an assembly language program for two 8 bit subtraction and Division in 8051.

15 a. Discuss on ADC interfacing with a neat diagram.

OR

b. With illustration explain interfacing a microcontroller to a DC Motor.

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Sl.No. 1525 **Sub. Code: 34116401**

VINAYAKA MISSIONS RESEARCH FOUNDATION, SALEM
(Deemed to be University)

B.E DEGREE EXAMINATIONS – FEB-2022

MECH
Fourth Semester

NUMERICAL METHODS

(Candidates admitted under 2016 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Which has faster convergence either Gauss-Seidel or *Gauss–Jacobi method*?
2. By *Gauss elimination method*, solve $x+y=2,\ 2x+3y=5$
3. When *Bessel's* formula is to be used?
4. Write the second order divided difference formula.
5. How will you improve the accuracy in the *Trapezoidal Rule*?
6. Evaluate $\int_1^2 \frac{dx}{1+x^2}$ by *Trapezoidal rule* with $h=0.5$.
7. Write down the *Runge-Kutta* formula of fourth order to solve $\frac{dy}{dx}=f(x,y)$ with $y(x_o)=y_o$
8. Given $y'=1-y$ and $y(0)=0$. Find $y(0.1)$ by *Modified Euler method.*
9. Write a finite difference scheme for solving $U_{xx}+U_{yy}=f(x,y)$
10. Classify $u_{xx}+4u_{yy}+3u_{xy}+4u_y+3u_x=0$

PART-B (5 x 16 = 80 Marks)

11.a) Solve the following system of equations by using *Gauss elimination* method.

$$10x-2y+3z=23$$
$$2x+10y-5z=-33$$
$$3x-4y+10z=41$$

OR

b) Find the inverse of a matrix $\begin{bmatrix} 2 & 1 & 1 \\ 3 & 2 & 3 \\ 1 & 4 & 9 \end{bmatrix}$ by *Gauss Jordan* method.

12.a) Given the data

x	0	1	2	3	4
y	2	3	12	35	78

Find the cubic polynomial of x, using *Newton's Backward Interpolation formula.*

OR

b) Apply *Lagrange's* formula inversely, to obtain the root of the equation $f(x)=0$ given that $f(0)=-4,\ f(1)=1,\ f(3)=29$ and $f(4)=52$.

(P.T.O)

13.a) Find the first, second and third derivatives of $f(x)$ at $x = 1.5$ if

x	1.5	2.0	2.5	3.0	3.5	4.0
$f(x)$	3.375	7.000	13.625	24.000	38.875	59.000

OR

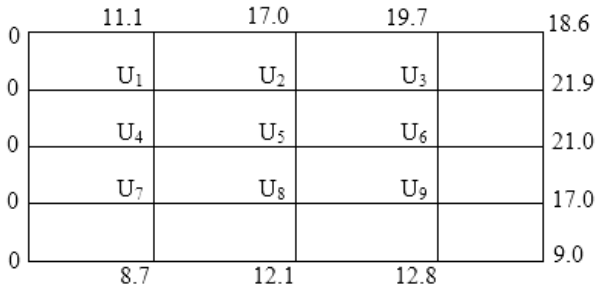
b) Evaluate $\int_0^1 \frac{\sin x}{x} dx$, by a *Gaussian* three – point quadrature formula.

14.a) Using Taylor series method, find approximate values of y and z corresponding to $x = 0.1$, given that $y(0) = 2, z(0) = 1$ by solving $\frac{dy}{dx} = x + z$ and $\frac{dz}{dx} = x - y^2$.

OR

b) Using *Modified Euler method*, Find $y(0.1)$, $y(0.2)$, given $\frac{dy}{dx} = x^2 + y^2, y(0) = 1.$

15.a) Solve $\frac{\partial^2 u}{\partial x^2} + \frac{\partial^2 u}{\partial y^2} = 0$ at the nine mesh points of the square given below. The values of u at the boundary are specified in the figure.



OR

b) Solve the *Poisson equation* $\nabla^2 u = -10(x^2 + y^2 + 10)$ over the square mesh with sides $x = 0, y = 0, x = 3, y = 3$ and $u = 0$ on the boundary. Assume mesh length $h = 1$ unit.

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Sl.No.1515 **Sub. Code: 34115203\34116203**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E. DEGREE EXAMINATION – FEB – 2022
BME, CSE, MECH
Second Semester
TRANSFORMS AND MATRICES
(Candidates admitted under 2015 and 2016 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Without finding the Eigen values, find the product of Eigen values of $\begin{pmatrix} 1 & 2 & -1 \\ -2 & 0 & 0 \\ 4 & 5 & 0 \end{pmatrix}$.
2. The characteristic equation of a matrix A is $\lambda^2 - 2 = 0$, what is A^3.
3. Prove that $L\left[t^{\frac{-1}{2}}\right] = \sqrt{\frac{\pi}{s}}$.
4. Find $L\left[\frac{e^{-3t} - e^{-4t}}{t}\right]$.
5. Find $L^{-1}\left[\frac{s}{(s+2)^2}\right]$.
6. Find $L^{-1}\left[\cot^{-1}(s)\right]$.
7. Find the Fourier cosine transform of e^{-2x}.
8. Given that $e^{\frac{-x^2}{2}}$ is self reciprocal under Fourier cosine transform, find Fourier sine transform of $xe^{\frac{-x^2}{2}}$.
9. Find $Z[4.3^n + 2(-1)^n]$
10. State the convolution theorem for Z transforms.

PART-B (5 x 16 = 80 Marks)

11.a) Find the Eigen values and Eigen vectors of $\begin{pmatrix} 2 & 2 & 0 \\ 2 & 1 & 1 \\ -7 & 2 & -3 \end{pmatrix}$.

OR

b) Verify Cayley Hamilton theorem for the matrix $\begin{bmatrix} 1 & 2 & 3 \\ 2 & -1 & 4 \\ 3 & 1 & -1 \end{bmatrix}$ and hence find A^4.

(P.T.O)

12.a) (i) Find $L\left[\frac{1-e^{t}}{t}\right]$ (ii) Find $L\left[\frac{\sin 3t\cos t}{t}\right]$.

OR

b) Find the Laplace transform of $f(t)=\begin{cases}\sin \omega t, & 0<t<\frac{\pi}{\omega}\\ 0, & \frac{\pi}{\omega}<t<\frac{2\pi}{\omega}\end{cases}$ with $f\left(t+\frac{2\pi}{\omega}\right)=f(t)$.

13.a) (i) Find $L^{-1}\left[\log\frac{s-a}{s^2+a^2}\right]$ (ii) Find $L^{-1}\left[\frac{s}{\left(s^2-a^2\right)^2}\right]$.

OR

b) Use Convolution theorem to find $L^{-1}\left[\frac{s+2}{\left(s^2+4s+13\right)^2}\right]$.

14.a) Define Fourier transform of a function and Find the Fourier Transform of

$$f(x)=\begin{cases}x & if\ |x|\le a\\ 0 & if\ |x|>a\end{cases}.$$

OR

b) (i) Find Fourier cosine transform of $f(x)=\begin{cases}\cos x & if\ 0<x<1\\ 0 & otherwise\end{cases}$

(ii) Find the Fourier sine transform of $3e^{-4x}+4e^{-3x}$.

15.a) Find $Z^{-1}\left[\frac{z^2}{z^2+4}\right]$ by using Residue theorem.

OR

b) Solve the difference equation

$y(k+2)-4y(k+1)+4y(k)=0$ *given* $y(0)=1, y(1)=0$

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Sl.No.1515A Sub.Code: 34116405

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E DEGREE EXAMINATIONS – FEB-2022
COMPUTER SCIENCE AND ENGINEERING
Fourth Semester

PROBABILITY AND QUEUING THEORY

(Candidates admitted under 2016 Regulations-CBCS)

Time: Three hours Maximum:100Marks

Answer **ALL** questions

PART – A (10 x 2 = 20 marks)

1. If X is a random variable prove that $E[aX+b]=aE[x]+b$.
2. If the PDF of a random variable X is given by $f(x)=\begin{cases}\frac{1}{4}, & -2<x<2\\ 0, & Otherwise\end{cases}$ Find $P(|X|)>1$.
3. 10 coins are thrown simultaneously. Find the probability of getting atleast 7 heads.
4. If the probability that a target is destroyed on any one shot is 0.5, what is the probability that it would be destroyed on 6^{th} attempt?
5. Define two dimensional random variables.
6. State the Liapounoff's form of Central of theorem.
7. Write down the conditions for wide-sense stationary random processes.
8. Define Binomial process.
9. Explain what is Kendal's notation by means of an example.
10. Consider (M/M/1): $(\infty / FIFO)$ .What is the formula for the average waiting time of a customer in the queue.

PART – B (5 x 16 = 80 marks)

11. a) A random variable X has the following probability distribution.

Values of X	0	1	2	3	4	5	6	7
P(x)	0	k	2k	2k	3k	k^2	$2k^2$	$7k^2+k$

Determine the value of 'k'

(i) Find $P(X<6), P(X\geq 6)$ *and* $P(0<X<5)$

(ii) Find the cumulative distribution function of X

(iii) *If* $P(X\leq c)>\frac{1}{2}$, Find the minimum value of c.

OR

b) Find the moment generating function of the random variable 'X' with the probability law

$P(X = x) = q^{x-1}p,\ x = 1, 2, 3, ...$ also find the mean and variance.

12. a) (i)If X is a Poisson variate such that $P(X = 1) = \frac{3}{10}$ *and* $p(X = 2) = \frac{1}{5}$, find P(X=0) and P(X=3).

(ii) If X is a Poisson variate such that $P(X = 2) = 9P(X = 4) + 90P(X = 6)$, Find (a) Mean of X (b) Variance of X .

OR

b) (i) Find the moment generating function of Gamma distribution.

(ii) State and prove memoryless property of the exponential distribution.

13. a) The two lines of regression are

$8x - 10y + 66 = 10$

$40x - 18y - 214 = 0$

The Variance of x is 9

Find i) the mean values of x and y

ii) the correlation coefficient between x and y

OR

b) (i) The life time of a certain brand of a tube light may be considered as a random variable with mean 1200 h and standard deviation 250 h. Find the probability, using central limit theorem, that the average life time of 60 lights exceeds 1250 h.

(ii) If X and Y each follow an exponential distribution with parameter 1 and are independent, find the pdf of U = X – Y.

14. a) Define a random process. Explain the classification of random processes with suitable examples.

OR

b) Show that the random process X(t) = Acos (ωt + θ) is wide sense stationary if A and ω are constants and θ is uniformly distributed over the interval $(0, 2\pi)$.

15. a) **A**t a Beauty Parlour shop, with one beautician, ladies arrive according to Poisson distribution with mean arrival rate of 5 per hour and hair design was exponentially distributed with an average design taking 10 minutes. As it is a very good parlour, customers do have patience to wait, find

(i) Average number of ladies in the shop and the average number of waiting to do the hair design.

(ii) % of time as arrival can walk inside the parlour without having to wait.

(iii)% of ladies who has to wait prior to getting into the chair for hair design.

OR

b) Customers arrive at a watch repair shop according to a poisson process at a rate of one per every 10 min and the service time exponential random variable with mean 8min. Find $L_s, L_q \ and \ W_s$. what is the probability that the server idle?

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Sl.No. 1512 **Sub. Code: 34416802**

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E. DEGREE EXAMINATION – FEB – 2022

MECHANICAL ENGINEERING

Eighth Semester

ELECTIVE: ADVANCED IC ENGINES

(Candidates admitted under 2016 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. What is vapour lock in a carburetor?
2. What is electronically controlled fuel metering?
3. What is direct injection and indirect injection system in a CI engine?
4. What is Soot? How and when it occurs?
5. What is meant by Air pollution?
6. What is positive crank case ventilation?
7. What is e-diesel and gasohol?
8. What is Biodiesel? What makes it usable in diesel engines?
9. What is Homogenous Charge Combustion Ignition (HCCI)?
10. Differentiate between homogeneous and heterogeneous mixture.

PART-B (5 x 16 = 80 Marks)

11.a) What are the requirements of a fuel injection in a spark ignition engine? Briefly explain i) Throttle Body Fuel Injection and ii) Multi point fuel injection system.

OR

b) Discuss the effects of engine variables on knock in a Spark Ignition Engine.

12.a) Explain the various stages of Combustion in a compression ignition engine.

OR

b) What is the purpose of a Turbocharger? Explain it with a neat sketch.

13.a) Explain the construction and functioning of a two way and a three way catalytic converter with neat sketch.

OR

b) How do you control evaporative emissions? Explain two such methods available.

14.a) What are the different methods for storage of hydrogen?

OR

b) Which materials are compatible with Compressed Natural Gas (CNG)? Write a short note on CNG kit and its components.

15.a) Explain the working of a stratified charge engine with a neat sketch in detail.

OR

b) Explain the merits and demerits of lean burning of diesel fuel in detail.

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Sl.No. 1510 SUBJECT CODE: 35016701

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
SEVENTH SEMESTER
CYBER SECURITY

(Candidates admitted under 2016 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What is Cyber Security?
2 What is resolution in DNS?
3 Show the layout of ICMP echo message.
4 What is IDS?
5 What are the techniques to gain a Foothold?
6 What are the DoS conditions?
7 What is Legacy Text Files?
8 What is Reflective DLL Injections?
9 Write about the job of Honeypots
10 What is Active analysis Automated Malicious Code?

PART-B (5 x 16 = 80)

11 a. Explain about Domain Name System (DNS).

OR

b. Explain about Window Messaging in Microsoft windows Security.

12 a. Explain the role of DNs and ICMP in Tunneling.

OR

b. Explain about Mobile malicious code.

13 a. Explain about Format String Vulnerabilities.

OR

b. Explain about Misdirection, Reconnaissance, and Disruption Methods.

14 a. Explain about Rootkits.

OR

b. Explain about Man-in-the-Middle Attacks.

15 a. Explain about Honey pot infrastructure in defense analysis techniques.

OR

b. Explain about Active Analysis in Automated Malicious Code Analysis Systems.

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Sl.No. 1513 SUBJECT CODE: 34116304

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS- FEB - 2022
MECT
THIRD SEMESTER
PDE APPLICATIONS AND COMPLEX ANALYSIS

(Candidates admitted under 2016 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define the order of partial differential equation.

2 Solve $(D^4 - D'^4)z = 0$

3 Find the constant a_0 of the Fourier series for function $f(x) = x$ in $0 \le x \le 2\pi$.

4 If $f(x) = |x|$ expanded as a Fourier series in $-\pi < x < \pi$, Find a_0.

5 Classify the P.D.E $u_{xx} + xu_{xy} = 0$

6 Define steady state temperature distribution.

7 State any two properties of Analytic function.

8 Define Harmonic function

9 Expand cosz in a Taylor's series at $z = \frac{\pi}{4}$

10 Define Removable singularity

PART-B (5 x 16 = 80)

11 a. (a) Solve $z = px + qy + \sqrt{pq}$

(b) Solve $pyz + qzx = xy$

OR

b. Solve $\left(D^3 - 7DD'^2 - 6D'^3\right)z = \sin(x + 2y) + e^{2x+y}$

12 a. Obtain the Fourier series to represent the function $f(x) = |x|$, $-\pi < x < \pi$.

OR

P.T.O

b. Obtain the sine series for the function $f(x) = \begin{cases} x \text{ in } o \le x \le \frac{l}{2} \\ l - x \text{ in } \frac{l}{2} \le x \le l \end{cases}$

13 a. A string is stretched between two fixed points at a distance $2l$ apart and the points of the string are given initial velocities v where

$$v = \begin{cases} \frac{cx}{l} & in \quad 0 < x < l \\ \frac{c}{l}(2l - x) & in \quad l < x < 2l \end{cases}$$

x being the distance from one end point. Find the displacement of the string at any subsequent time.

OR

b. Find the temperature distribution in a homogeneous bar of length π which is insulated laterally, if the ends are kept at zero temperature and if, initially, the temperature is k at the centre of the bar and falls uniformly to zero at its ends.

14 a. Find the bilinear transformation which maps the points $z = -2, 0, 2$ into the points $w = 0, i, -i$ respectively

OR

b. Find $f(z) = u + iv$ given that $u - 2v = e^x(\cos y - \sin y)$

15 a. Obtain Taylor's series to represent the function $\frac{z^2 - 1}{(z+2)(z+3)}$ in the region $|z| < 2$.

OR

b. Expand $f(z) = \frac{1}{(z+1)(z+3)}$ in Laurent's series valid for the regions

(i) $|z| > 3$ and (ii) $1 < |z| < 3$

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Sl.No.1514 Sub.Code: 34112404

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E DEGREE EXAMINATIONS – FEB-2022
COMPUTER SCIENCE AND ENGINEERING
Fourth Semester

PROBABILITY AND QUEUING THEORY

(Candidates admitted under 2012 Regulations-CBCS)

Time: Three hours Maximum:100Marks

Answer **ALL** questions

PART – A (10 x 2 = 20 marks)

1. If X is a random variable prove that $E[aX+b]=aE[x]+b$.
2. If the PDF of a random variable X is given by $f(x)=\begin{cases}\frac{1}{4}, & -2<x<2\\ 0, & Otherwise\end{cases}$ Find $P(|X|)>1$.
3. 10 coins are thrown simultaneously. Find the probability of getting atleast 7 heads.
4. If the probability that a target is destroyed on any one shot is 0.5, what is the probability that it would be destroyed on 6^{th} attempt?
5. Define two dimensional random variables.
6. State the Liapounoff's form of Central of theorem.
7. Write down the conditions for wide-sense stationary random processes.
8. Define Binomial process.
9. Explain what is Kendal's notation by means of an example.
10. Consider (M/M/1): $(\infty / FIFO)$ .What is the formula for the average waiting time of a customer in the queue.

PART – B (5 x 16 = 80 marks)

11. a) A random variable X has the following probability distribution.

Values of X	0	1	2	3	4	5	6	7
P(x)	0	k	2k	2k	3k	k^2	$2k^2$	$7k^2+k$

Determine the value of 'k'

(i) Find $P(X<6), P(X\geq 6)$ *and* $P(0<X<5)$

(ii) Find the cumulative distribution function of X

(iii) *If* $P(X\leq c)>\frac{1}{2}$, Find the minimum value of c.

OR

b) Find the moment generating function of the random variable 'X' with the probability law

$P(X = x) = q^{x-1}p,\ x = 1, 2, 3, ...$ also find the mean and variance.

12. a) (i)If X is a Poisson variate such that $P(X = 1) = \frac{3}{10}$ *and* $p(X = 2) = \frac{1}{5}$, find P(X=0) and P(X=3).

(ii) If X is a Poisson variate such that $P(X = 2) = 9P(X = 4) + 90P(X = 6)$, Find (a) Mean of X (b) Variance of X .

OR

b) (i) Find the moment generating function of Gamma distribution.

(ii) State and prove memoryless property of the exponential distribution.

13. a) The two lines of regression are

$8x - 10y + 66 = 10$

$40x - 18y - 214 = 0$

The Variance of x is 9

Find i) the mean values of x and y

ii) the correlation coefficient between x and y

OR

b) (i) The life time of a certain brand of a tube light may be considered as a random variable with mean 1200 h and standard deviation 250 h. Find the probability, using central limit theorem, that the average life time of 60 lights exceeds 1250 h.

(ii) If X and Y each follow an exponential distribution with parameter 1 and are independent, find the pdf of U = X – Y.

14. a) Define a random process. Explain the classification of random processes with suitable examples.

OR

b) Show that the random process X(t) = Acos (ωt + θ) is wide sense stationary if A and ω are constants and θ is uniformly distributed over the interval $(0, 2\pi)$.

15. a) **A**t a Beauty Parlour shop, with one beautician, ladies arrive according to Poisson distribution with mean arrival rate of 5 per hour and hair design was exponentially distributed with an average design taking 10 minutes. As it is a very good parlour, customers do have patience to wait, find

(i) Average number of ladies in the shop and the average number of waiting to do the hair design.

(ii) % of time as arrival can walk inside the parlour without having to wait.

(iii)% of ladies who has to wait prior to getting into the chair for hair design.

OR

b) Customers arrive at a watch repair shop according to a poisson process at a rate of one per every 10 min and the service time exponential random variable with mean 8min. Find $L_s, L_q \ and \ W_s$. what is the probability that the server idle?

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Sl.No. 1510 SUBJECT CODE: 35016701

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E-DEGREE EXAMINATIONS- FEB - 2022
COMPUTER SCIENCE AND ENGINEERING
SEVENTH SEMESTER
CYBER SECURITY

(Candidates admitted under 2016 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What is Cyber Security?
2 What is resolution in DNS?
3 Show the layout of ICMP echo message.
4 What is IDS?
5 What are the techniques to gain a Foothold?
6 What are the DoS conditions?
7 What is Legacy Text Files?
8 What is Reflective DLL Injections?
9 Write about the job of Honeypots
10 What is Active analysis Automated Malicious Code?

PART-B (5 x 16 = 80)

11 a. Explain about Domain Name System (DNS).

OR

b. Explain about Window Messaging in Microsoft windows Security.

12 a. Explain the role of DNs and ICMP in Tunneling.

OR

b. Explain about Mobile malicious code.

13 a. Explain about Format String Vulnerabilities.

OR

b. Explain about Misdirection, Reconnaissance, and Disruption Methods.

14 a. Explain about Rootkits.

OR

b. Explain about Man-in-the-Middle Attacks.

15 a. Explain about Honey pot infrastructure in defense analysis techniques.

OR

b. Explain about Active Analysis in Automated Malicious Code Analysis Systems.

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Sl.No.1501 Sub.Code: 34112301

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.E DEGREE EXAMINATIONS – FEB-2022

COMMON TO CIVIL, EEE, MECH

Third Semester

ADVANCED ENGINEERING MATHEMATICS

(Candidates admitted under 2012 Regulations-CBCS)

Time: Three hours Maximum:100Marks

Answer **ALL** questions

PART – A (10 x 2 = 20 marks)

1. Find the complete integral of $z = px + qy + p^2 + q^2$
2. Solve: $\left(D^2 - 5DD' + 6D'^2\right) z = 0$
3. Obtain the half range sine series for unity in $(0, \pi)$.
4. Find the R.M.S value of the function $f(x) = x^2$ in (0, 2)
5. Classify the equation $4\frac{\partial^2 u}{\partial x^2} - 3\frac{\partial^2 u}{\partial x \partial y} = 0$.
6. How many boundary conditions are needed to solve one dimensional heat flow equation in (0, *l*)?
7. Prove that $F[f(ax)] = \frac{1}{a} F\left(\frac{s}{a}\right)$, a>0
8. If F(s) = F[f(x)] ,Prove that F [f(x-a)] = e^{ias} F(s)
9. Prove that $z\left[na^{n-1}\right] = \frac{z}{(z-a)^2}$
10. Find the Z- transform of $\left(-\frac{1}{3}\right)^n$

PART – B (5 x 16 = 80 marks)

11. a) Form the partial differential equation by eliminating the function ‘f’from the relation $z = x^2 + 2f\left[\frac{1}{y} + \log x\right]$

(b) Solve $\frac{y^2 z}{x} p + xzq = y^2$

P.T.O

OR

b) Solve $(D^2 - 2DD')z = x^3y + e^{2x}$

12. a) Expand $f(x) = x^2$ when $-\pi < x < \pi$ as a Fourier Series of periodicity 2π. Hence deduce that (i) $\frac{1}{1^2} + \frac{1}{2^2} + \frac{1}{3^2} + ... = \frac{\pi^2}{6}$,

(ii) $\frac{1}{1^2} - \frac{1}{2^2} + \frac{1}{3^2} - ..... = \frac{\pi^2}{12}$

OR

b) Find the Fourier series expansion of period $2l$ for the function y = f(x) which is defined in $(0, 2l)$ by means of the table of values given below. Find the series up to the second harmonic.

x	0	1	2	3	4	5
$f(x)$	9	18	24	28	26	20

13. a) A rod 30cm long, has its ends A and B kept at $20^0 c$ and $80^0 c$ respectively until steady state condition prevail. The temperature at each end is then suddenly reduced to $0^0 c$ and kept so. Find the resulting temperature function u(x,t) .

OR

b) A tightly stretched string with fixed end points $x = 0$ and $x = l$ is initially in a position given by $y(x,0) = y_0 \sin^3\left(\frac{\pi x}{l}\right)$. If it is released from rest from this position, find the displacement 'y' at any distance from one end at any time 't'.

14. a) Define Fourier transform of a function and Find the Fourier Transform of

$$f(x) = \begin{cases} x & if\ |x| \le a \\ 0 & if\ |x| > a \end{cases}$$

OR

b) Show that the Fourier transform of $f(x) = \begin{cases} a^2 - x^2 & |x| < a \\ 0 & |x| > a > 0 \end{cases}$ is $2\sqrt{\frac{2}{\pi}}\left(\frac{\sin as - as\cos as}{s^3}\right)$. Hence deduce that $\int_0^\infty \frac{\sin t - t\cos t}{t^3} dt = \frac{\pi}{4}$.

P.T.O

15. a) Solve the equation $y(n+2)-3y(n+1)+2y(n)=2^n$ given $y_0 = y_1 = 0$

OR

b) Find $z^{-1}\left[\dfrac{z^2-3z}{(z-5)(z+2)}\right]$

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Sl.No. 1509 SUBJECT CODE: 38115501

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E -DEGREE EXAMINATIONS - FEB-2022
BIOMEDICAL ENGINEERING
FIFTH SEMESTER
HUMAN ANATOMY AND PHYSIOLOGY

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Define anatomical position.

2 What is action potential?

3 What is blood pressure? Give the normal value.

4 Classify the types of hypoxia.

5 What are the functions of nervous system?

6 Mention the types of muscles.

7 What are the major salivary glands?

8 What are the processes involved in urine formation?

9 What are the different types of tissues which forms ear drum?

10 Name the hormones synthesized from thyroid gland.

PART-B (5 x 16 = 80)

11 a. Describe the mechanism of transport across the cell membrane.

OR

b. Describe the conduction of action potential in nerve fiber.

12 a. Define ECG. Explain the normal waves and significance of ECG.

OR

b. Draw and explain the structure respiratory system in details.

13 a. Write an essay on Somatic Nervous System.

OR

b. What is reflex action? Explain with suitable example.

14 a. Describe in detail about the movement of GI tract.

OR

b. Give an account on pancreas.

15 a. Explain the major events in the physiology of hearing.

OR

b. Describe in detail about the pituitary glands.

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Sl.No. 1505 SUBJECT CODE: 34415701

VINAYAKA MISSIONS RESEARCH FOUNDATION

(Deemed to be University)

B.E-DEGREE EXAMINATIONS- FEB - 2022

MECHANICAL ENGINEERING

SEVENTH SEMETER

FINITE ELEMENT ANALYSIS

(Candidates admitted under 2015 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 Explain force method and stiffness method?
2 What is Rayleigh – Ritz method?
3 What is the classification of co-ordinates?
4 Define total potential energy.
5 How do you define two dimensional elements?
6 Write a displacement function equation for CST element.
7 Write down the compatibility equations
8 Define total potential energy
9 What are the types of non-linearity?
10 Write the Gaussian quadrature expression for numerical integration .

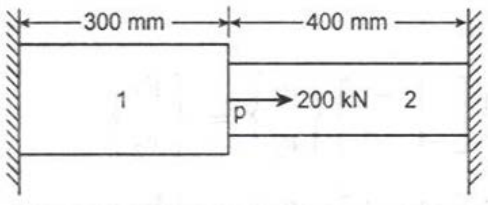
PART-B (5 x 16 = 80)

11 a. Explain the following (i) Variational approach. (ii) weighted residual methods.

OR

b. List the advantages, Disadvantages and Application of FEA.

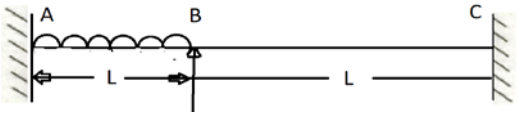
12 a. Consider a bar as shown in fig. An axial load of 200 kN is applied at point P. Take A_1 = 2400 $mm^{2,}$ $E_1 = 70 \times 10^9$ N / m^2, A_2 = 600 mm^2 $E_2 = 200 \times 10^9$ N / m^2. Calculate the following: (a) The nodal displacement at point P. (b) Stress in each material. (c)Reaction.



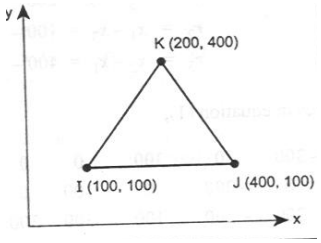
OR

(P.T.O)

b. A fixed beam of length 2L m carries a uniformly distributed load of w (N/m) which run over a length of L m from the fixed end, as shown in Fig. Calculate the rotation at point B.



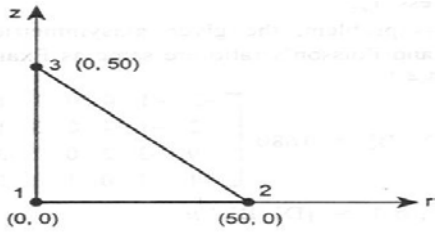
13 a. For the constant strain triangular element shown in Fig. assemble strain-displacement matrix. Take t = 20 mm and E = 2 x 10^5 N/mm^2.



OR

b. Derive shape function for the constant strain triangular element (CST) for One dimensional Problem.

14 a. For the axisymmetric elements shown in Fig, determine the element stresses. Let E = 210GPa and $\gamma = 0.25$. The co-ordinates (in millimeters) are in shown Fig. The nodal displacements are:u_1 = 0.05 mm; w_1 = 0.03mm u_2 = 0.02 mm; w_2 = 0.02mm u_3 = 0 mm; w_3 = 0 mm



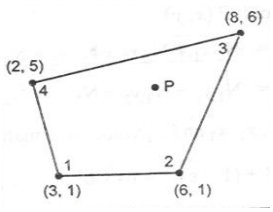
OR

b. The (x,y) co- ordinate of nodes i, j and k of an axis-symmetric triangular element are given by (3,4) (6,5) and (5,8) respectively. The element displacement (in cm) vector is given as q= $[0.002, 0.001, 0.001, 0.004, -0.003, 0.007]^T$ Determine elemental strains.

15 a. Evaluate the integral and compare with exact solution. $I = \int_{-1}^{1} (2 + x + x^2) dx.$

OR

b. For the Isoparametric quadrilateral element shown in fig. Determine the local co-ordinates point P which has Cartesian co-ordinates(7,4)



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Sl.No. 1508 SUBJECT CODE: 34412702

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E.DEGREE EXAMINATIONS-FEB - 2022
MECHANICAL ENGINEERING
SEVENTH SEMESTER
FINITE ELEMENT ANALYSIS

(Candidates admitted under 2012 Regulations-CBCS)

Time : Three Hours Maximum Marks:100 Marks

Answer **ALL** questions

Part-A (10 x 2 =20 Marks)

1 What is mean by finite element analysis?

2 What is discretization?

3 What is mean by plane stress analysis?

4 Define temperature effects.

5 Write down the shape function for four noded rectangular element using natural co-ordinate system.

6 What are the disadvantages of formulation?

7 What is meant by equilibrium equation?

8 Define Formulations of element

9 Define longitudinal vibration.

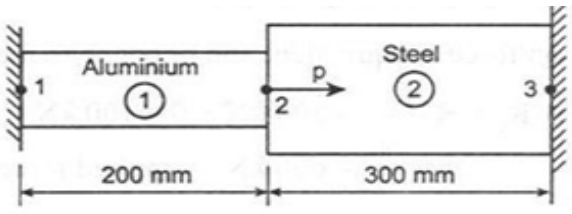
10 Define special element formulation.

PART-B (5 x 16 = 80)

11 a. Explain the following (i) Variational approach. (ii) weighted residual methods.

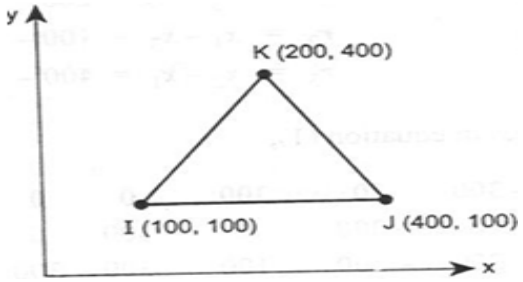
OR

b. An axial load of 4 x 10 5 N is applied at 30°C to the rod as shown in fig. The temperature is then raised to 60°C. Calculate the following:
(i) Assemble the K and F matrices. (ii) Nodal displacements.
(iii) Stresses in each material. (iv) Reactions at each nodal point.
For Aluminium A1 = 1000 mm2, E1 = 7 x 10 4 N / mm2, α1= 23 x 10 -6 / 0 c
For Steel A2 = 1500 mm2 E2 = 2 x 10 5 N / mm2. α2= 12 x 10 -6 / 0 c



P.T.O

12 a. For the constant strain triangular element shown in Fig. assemble strain-displacement matrix. Take t = 20 mm and E = 2 x 105 N/mm2.



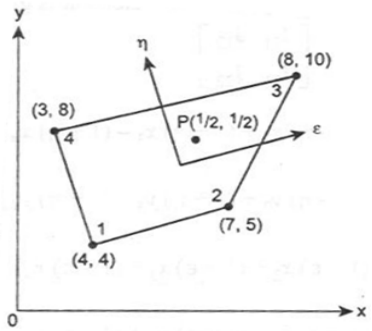
OR

b. A steel rod of length d=2cm, length L=5cm and thermal conductivity k=50W/m°C is exposed at one end to a constant temperature of 320°C.The other end is in ambient air of temperature 20°C with a convection coefficient of h=100 W/ m^2°C.Determine the temperature at the midpoint of the rod.

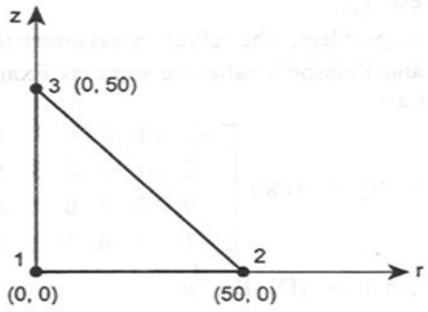
13 a. Evaluate the integral $I = \int_{1}^{1} (2 + x + x^2)dx$. and compare with exact solution.

OR

b. Evaluate [J] at e =h= 1/2 for the linear quadrilateral element shown.

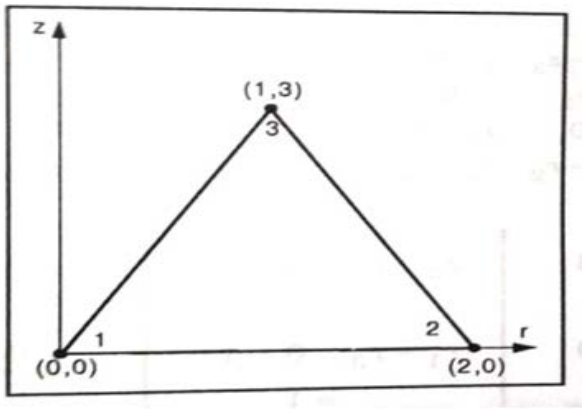


14 a. For the axisymmetric elements shown in Fig, determine the element stresses. Let E = 210GPa and γ = 0.25. The co-ordinates (in millimeters) are in shown Fig.
The nodal displacements are:
a. u 1 = 0.05 mm; w1 = 0.03mm
b. u 2 = 0.02 mm; w 2 = 0.02mm
c. u 3 = 0 mm; w3 = 0 mm

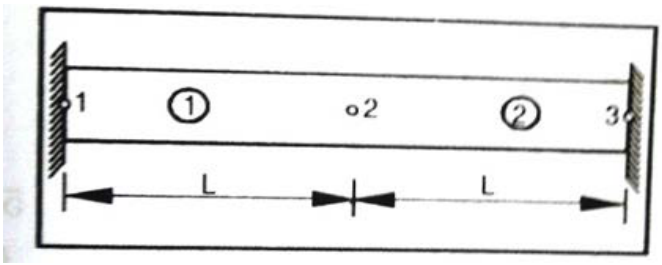


OR

b. Calculate the strain-displacement matrix and stress- strain relationship matrix and thermal force vector for the axis symmetric element show in the figure. The element experiences 15°C increase in temperature. Take α= 10x10-6/°C, E= 2.1x105 and γ = 0.25



15 a. Determine the natural frequency of vibration for a beam fixed at the both ends as show in the figure. The beam has mass density ρ, modulus of elasticity E, cross sectional area A, moment of inertia I. For simplicity the beam is discretized into two elements of length L.



OR

b. Find the eigen values and eigen vectors of the matrix

$$\begin{bmatrix} 1 & 2 & 3 \\ 0 & 2 & 3 \\ 0 & 0 & 2 \end{bmatrix}$$

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Sl.No. 1506 **Sub. Code: 34116404**

VINAYAKA MISSIONS RESEARCH FOUNDATION
B.E DEGREE EXAMINATION – FEB-2022
ELECTRONICS AND COMMUNICATION ENGINEERING

Fourth Semester

NUMERICAL METHODS AND RANDOM PROCESSES

(Candidates admitted under 2015&2016 Regulations – CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. What is the error involved in Newton's interpolation formula?
2. Write the second order divided difference formula.
3. State Taylor series algorithm for the first order differential equation.
4. Solve $y' = x + y, y(0) = 1$ by Taylor's series method. Find $y(0.1)$.
5. A random variable X has the p.d.f. $f(x) = \begin{cases} 2x, & 0 < x < 1 \\ 0, & \text{otherwise} \end{cases}$. Find $P\left(X < \frac{1}{2}\right)$.
6. Find $E(X)$ if p.d.f. of a continuous random variable is given as $f(x) = \begin{cases} 2x, & 0 < x < 1 \\ 0, & \text{elsewhere} \end{cases}$.
7. State Chapman-Kolmogorov theorem.
8. State any two properties of Binomial process.
9. Prove that $R_{XY}(\tau) = R_{YX}(-\tau)$.
10. Check the given function $\frac{\omega^2 + 4}{4\omega^4 + 3\omega^2 + 5}$ is a valid power density spectrum or not.

PART-B (5 x 16 = 80 Marks)

11. a) Using Newton's forward interpolation formula, find the value of $\sin 47^0$ given that $\sin 45^0 = 0.7071; \sin 50^0 = 0.7660; \sin 55^0 = 0.8192$ and $\sin 60^0 = 0.8660$.

OR

b) Obtain the value of $y(5)$ using Bessel's formula, given

x	0	4	8	12
$f(x)$	143	158	177	199

12. a) Using Rung- Kutta method of fourth order by solving $\frac{dy}{dx} = \frac{y^2 - x^2}{y^2 + x^2}$ with $y(0) = 1, h = 0.2$, find $y(0.2)$.

OR

[P.T.O]

b) Solve $\frac{d^2y}{dx^2} - x\left(\frac{dy}{dx}\right)^2 + y^2 = 0$ using Runge-Kutta method for $x = 0.2$ correct to 4 decimal places, initial conditions are $x = 0, y = 1, y' = 0$.

13. a) A random variable X has the following probability function

Values of X	0	1	2	3	4	5	6	7	8
$P(X)$	a	3a	5a	7a	9a	11a	13a	15a	17a

(i) Determine the value of 'a'.

(i) Find $P(X < 3), P(X \geq 3), P(0 < X < 5)$.

(ii) Find the distribution function of X.

OR

b) The probability distribution function of a random variable X is

$$f(x) = \begin{cases} x, & 0 < x < 1 \\ 2 - x, & 1 < x < 2 \\ 0, & x > 2 \end{cases}$$. Find the mean and variance of X.

14. a) Prove that the process $X(t)$ whose probability distribution under certain conditions is given by $P[X(t) = n] = \begin{cases} \frac{(at)^{n-1}}{(1+at)^{n+1}}, & n = 1, 2, 3... \\ \frac{at}{1+at}, & n = 0 \end{cases}$ is not stationary.

OR

b) Verify whether the sine wave random process $X(t) = Y \sin \omega t$, Where Y is uniformly distributed in the interval $(-1,1)$ is WSS or not.

15. a) Find the auto correlation function of the random process $X(t) = A\cos(\omega t + \theta)$, where A and ω are constants, θ is a random variable uniformly distributed in $(-\pi, \pi)$.

OR

b) The autocorrelation of the random binary transmission is given by

$$R_{XX}(\tau) = \begin{cases} 1 - \frac{|\tau|}{T}, & \text{for } |\tau| \leq T \\ 0, & \text{for } |\tau| > T \end{cases}$$ .Find the power spectrum.

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Sl.No. 1507 **Sub. Code: 34115306/34116306**

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.E. DEGREE EXAMINATION- FEB - 2022

COMMON TO CSE AND IT

Third Semester

NUMERICAL METHODS, PDE AND APPLICATIONS

(Candidates admitted under 2015&2016 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. Which has faster convergence either Gauss-Seidel or Gauss–Jacobi method?
2. Find an iterative formula to find $\sqrt{N}$, where *N* is a positive number.
3. If $f(3)=5$ and $f(5)=3$, what is the form of $f(x)$ by Lagrange's Formula?
4. When will you use Newton's backward interpolation formula?
5. Find the complete solution of the PDE $p+q=x+y$.
6. Find the Particular Integral of $\left(D^2+3DD'+2D'^2\right)z=\sin(x+5y)$.
7. Find the half-range sine series for $f(x)=x^2$ in $(0,\pi)$
8. In the Fourier series expansion of $f(x)=|\sin x|$ in $(-\pi,\pi)$. What is value of b_n
9. How do we classify the second order partial differential equation?
10. In the wave equation $\frac{\partial^2 y}{\partial t^2}=a^2\frac{\partial^2 y}{\partial x^2}$ what does a^2 stand for?

PART-B (5 x 16 = 80 Marks)

11.a) Find the root of $xe^x=3$ by Regula falsi method correct to 3 decimal places.

OR

b) Solve the system of equations by Gauss elimination method. $10x-2y+3z=23;\ 2x+10y-5z=-33;\ 3x-4y+10z=41$.

12.a) Using Newton's Forward Interpolation Formula, find the value of Sin 47° given that Sin 45° = 0.7071; Sin 50° = 0.7660; Sin 55° = 0.8192; and Sin 60° = 0.8660.

OR

b) Obtain the value of $y(5)$, using Bessel's formula given

x	0	4	8	12
$f(x)$	143	158	177	199

13.a) (i) Form the partial differential equation by eliminating f from $f\left(xy+z^2,\ x+y+z\right)=0$

(ii) Find the complete solution and singular solution of $z=px+qy+p^2-q^2$

OR

b) Solve $r+s-6t=y\cos x$.

P.T.O

14.a) Obtain the Fourier series for the function $f(x) = x\cos x$ in $(-\pi, \pi)$

OR

b) Find the Fourier series expansion of period 2π for the function $y = f(x)$ which is defined in $(0, 2\pi)$ by means of the table of value given below. Find the series up to the third harmonic

x	0	$\frac{\pi}{3}$	$\frac{2\pi}{3}$	π	$\frac{4\pi}{3}$	$\frac{5\pi}{3}$	2π
y	1.0	1.4	1.9	1.7	1.5	1.2	1.0

15.a) A uniform string is stretched and fastened to two points $x = 0$ and $x = l$ apart. Motion is started by displacing the string into the form of the curve $y = k\sin^3\left(\frac{\pi x}{l}\right)$ and then releasing it from this position at time $t = 0$. Find the displacement of the point of the string at a distance x from one end at time t.

OR

b) square plate is bounded by the lines $x = 0$, $y = 0$, $x = 20$ and $y = 20$. Its faces are insulated. The temperature along the upper horizontal edge is given by $u(x, 20) = x(20 - x)$, while the other three edges are kept at 0^oC. Find the steady state temperature distribution in the plate.

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Sl.No. 1504 **Sub. Code: 34112102**

VINAYAKA MISSIONS RESEARCH FOUNDATION

B.E. DEGREE EXAMINATION- FEB - 2022

CSE, MECH)

First Semester

ENGINEERING MATHEMATICS I

(Candidates admitted under 2012 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. 1. Find the characteristic equation of the matrix $\begin{pmatrix} 1 & 2 & 2 \\ 2 & 1 & 2 \\ 2 & 2 & 1 \end{pmatrix}$

2. If λ is an Eigen value of a matrix A then what are the Eigen values of A^{-1} and A^2.

3. Find the complementary function of $\frac{d^2y}{dx^2} + y = \cos ecx$.

4. Solve $\left(D^2 + 16\right)y = 0$

5. Evaluate $\int_0^1 \int_0^2 xy^2 dxdy$

6. Define Line integral

7. Find $L(\sin^3 2t)$

8. Find $L[3e^{5t} + 5\cos t]$

9. Find $L^{-1}\left[\frac{s}{(s+3)^2}\right]$

10. Verify the initial value theorem for the function $f(t) = 1 + e^{-t} + t^2$

PART-B (5 x 16 = 80 Marks)

11.a) Verify Cayley-Hamilton theorem for the matrix $\begin{pmatrix} 1 & 0 & 3 \\ 2 & 1 & -1 \\ 1 & -1 & 1 \end{pmatrix}$. Also find its inverse

OR

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b) Find A^4 using Cayley-Hamilton theorem for the matrix A = $\begin{pmatrix} 1 & 2 & 3 \\ 2 & -1 & 4 \\ 3 & 1 & -1 \end{pmatrix}$

12.a) Solve $\frac{d^2y}{dx^2} + y = \cos ecx$ by using method of variation of parameter.

OR

b) Solve the simultaneous equations $\frac{dx}{dt} + 2y + \sin t = 0, \frac{dy}{dt} - 2x - \cos t = 0$

13.a) Using double integral, Find the area bounded by $y = x$ *and* $y = x^2$

OR

b) Evaluate $\int_0^1 \int_0^{1-x} \int_0^{1-x-y} \frac{dzdydx}{(x+y+z+1)^3}$

14.a) Find the Laplace transform of the half wave rectifier function

$$f(t) = \begin{cases} \sin \omega t, & 0 < t < \frac{\pi}{\omega} \\ 0, & \frac{\pi}{\omega} < t < \frac{2\pi}{\omega} \end{cases} \quad \text{with} \quad f\left(t + \frac{2\pi}{\omega}\right) = f(t)$$

OR

b) (i) Find L[$\cos^3$t] .
(ii) Find L[cos3t sin2t]

15.a) Solve y'' – 3y' + 2y $= e^{2t}, y(0) = -3, y'(0) = 5,$ by using Laplace transform

OR

b) Find $L^{-1}\left[\frac{s}{(s^2 + a^2)^2}\right]$ using convolution theorem.

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Sl.No. 1512 Sub. Code: 34416802

VINAYAKA MISSIONS RESEARCH FOUNDATION
(Deemed to be University)
B.E. DEGREE EXAMINATION – FEB – 2022

MECHANICAL ENGINEERING

Eighth Semester

ELECTIVE: ADVANCED IC ENGINES

(Candidates admitted under 2016 Regulations - CBCS)

Time: Three hours Maximum: 100 marks

Answer **ALL** questions

PART – A (10 x 2 = 20 Marks)

1. What is vapour lock in a carburetor?
2. What is electronically controlled fuel metering?
3. What is direct injection and indirect injection system in a CI engine?
4. What is Soot? How and when it occurs?
5. What is meant by Air pollution?
6. What is positive crank case ventilation?
7. What is e-diesel and gasohol?
8. What is Biodiesel? What makes it usable in diesel engines?
9. What is Homogenous Charge Combustion Ignition (HCCI)?
10. Differentiate between homogeneous and heterogeneous mixture.

PART-B (5 x 16 = 80 Marks)

11.a) What are the requirements of a fuel injection in a spark ignition engine? Briefly explain i) Throttle Body Fuel Injection and ii) Multi point fuel injection system.

OR

b) Discuss the effects of engine variables on knock in a Spark Ignition Engine.

12.a) Explain the various stages of Combustion in a compression ignition engine.

OR

b) What is the purpose of a Turbocharger? Explain it with a neat sketch.

13.a) Explain the construction and functioning of a two way and a three way catalytic converter with neat sketch.

OR

b) How do you control evaporative emissions? Explain two such methods available.

14.a) What are the different methods for storage of hydrogen?

OR

b) Which materials are compatible with Compressed Natural Gas (CNG)? Write a short note on CNG kit and its components.

15.a) Explain the working of a stratified charge engine with a neat sketch in detail.

OR

b) Explain the merits and demerits of lean burning of diesel fuel in detail.

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