CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations December-2024

Course Name: Discrete Mathematics

(Common for CSE, IT, CSC & CSM)

| Date: 17.12.2024 AN | Time: 3 hours | Max.Marks: 70 |

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	State the Absorption law and Domination laws of set Theory.	2 M
2.	What is Power set? The number of elements in the power set $P(P(P(\emptyset)))$=?	2 M
3.	Find the prime factorizations of 100, 641, 999, and 1024.	2 M
4.	How many 3 digits even numbers can be created if repetitions digits are not allowed?	2 M
5.	Construct the truth table of the compound proposition $(p \vee \neg q) \rightarrow (p \wedge q)$.	2 M
6.	What is the purpose of Quantifiers?	2 M
7.	Find the value of $1 \cdot 0 + \overline{(0 + 1)}$.	2 M
8.	What is Sub Monoid in algebraic structure? Give example.	2 M
9.	Find chromatic number of C_5 and W_5.	2 M
10.	Find (i) the maximum length of a Trail and (ii) The maximum length of a circuit in K_6.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	Write properties of Equivalence relation. If R be a relation in the set of integers Z defined by R={(x,y): x ∈Z, y ∈Z, (x-y) is divisible by 6} then prove that R is an equivalence Relation	10M

OR

11. B).	i) If f and $f \circ g$ are one-to-one, does it follow that g is one-to-one? Justify your answer.	5M
	ii) If f and $f \circ g$ are onto, does it follow that g is onto? Justify your answer.	5M

12. A).	Write Euclidean Algorithm. Use the Euclidean algorithm to find i) GCD(414,662) ii) GCD(1819,3587). In each case the GCD as a linear combination of the given number.	10M

OR

12. B).	i) Find the number of permutations of the letters of the word MASSASAUGA. In how many of these all four A's are together? How many of them begin with S?	5M
	ii) How many numbers from 1-1000 are there that are not divisible by any of the digits 2,3 and 5.	5M

13. A).	i) Show that $[(p \vee q) \wedge (p \rightarrow r) \wedge (q \rightarrow r)] \rightarrow r = T$ (tautology) by using truth table .	5M
	ii) Show that $\neg(p \vee (\neg p \wedge q))$ and $\neg p \wedge \neg q$ are logically equivalent.	5M

OR

13. B).	i) Prove that $\sqrt{2}$ is irrational by given a proof by contradiction.	5M
	ii) Show that R is logically derived from $P \rightarrow Q$, $Q \rightarrow R$, and P.	5M

(P.T.O..)

14. A). Obtain the Principle Disjunctive Normal Form of the following given formula: 10M
   $[P \rightarrow (Q \wedge R)] \wedge [\neg P \rightarrow (\neg Q \wedge \neg R)]$

   OR

14. B). Define Ring. Prove that the set S of all order pairs(a,b) of real numbers is a commutative   10M
   ring with zero divisors under the binary operations .

15. A). What is planar graph? Prove that K_5 and $K_{3,3}$ is non planar graph.   10M

   OR

15. B). Define complete graph, regular graph and bipartite graph.   10M
   Prove that a connected graph is Euler if and only if all the vertices of G are even degree.

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations December-2024
Course Name: Analog & Digital Electronics
(Common for CSE & IT)

Date: 19.12.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	Draw the VI characteristics of ideal pn junction diode.	2 M
2.	What is meant by avalanche breakdown?	2 M
3.	Define early effect.	2 M
4.	How transistor acts as an amplifier.	2 M
5.	Differentiate between enhancement and depletion modes of MOSFET.	2 M
6.	Define 'Minterm' and 'Maxterm'.	2 M
7.	Convert $A3B_H$ and $2F3_H$ into Binary and Octal respectively.	2 M
8.	How do you draw a full adder circuit?	2 M
9.	Distinguish between combinational and sequential circuits.	2 M
10.	List out the applications of shift registers.	2 M

PART-B
**Answer the following. Each question carries TEN Marks.**   5x10=50M

11.A). Give the diode current equation. Show that the Zener diode is used as voltage regulator.   10M

OR

11. B). Explain the operation of bridge rectifier using diode with neat waveforms.   10M

12. A). With a neat diagram, explain the input-output characteristics of common base configuration of NPN transistor.   10M

OR

12. B). What is called intrinsic stand-off ratio of UJT? Determine the frequency of oscillation of an UJT relaxation oscillator. Assuming Re = 10.7KΩ, Ce = 0.22 pF and Intrinsic stand-off ratio = 0.56. Give the applications of UJT.   10M

13. A). Explain the construction and operation of JFET with neat sketches.   10M

OR

13. B). i) Find Excess-3 code for the following decimal numbers: $(18)_{10}$ and $(56)_{10}$.   4M
ii) Identify the equivalent Gray code for $[10110]_2$; Add $(65)_{10}+(58)_{10}$.   3M
iii) Perform 2's complement subtraction of 010110 – 100101.   3M

14. A). Prepare Karnaugh map for Y (A, B, C, D) = $\prod M(0,3,4,9,10,12) + \prod d(2,7,8,13)$ and draw the logic diagram using basic gates.   10M

OR

14. B). Plot the following logical Expression on a 4-variable K – map F=ABCD+AB'C'D'+AB'C+AB & realize the SOP using only NAND gates and POS using only NOR gates.   10M

(P.T.O..)

15. A). Illustrate the design procedure of a MOD-5 synchronous counter using JK flip-flops and implement it.   10M

OR

15. B). Design a synchronous sequential circuit using JK Flip-flop for the given state diagram.   10M
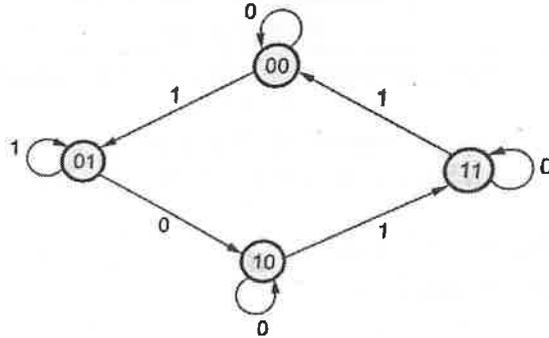
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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations December-2024
Course Name: Computer Organization & Architecture
(Common for CSE, IT, CSC & CSM)

Date: 21.12.2024 AN　　　　　Time: 3 hours　　　　　Max.Marks:70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks. 10x2=20M

1.	Draw the basic functional units of a computer and explain each unit.	2 M
2.	What is register?	2 M
3.	Write the Advantages and Disadvantages of Carry Look-Ahead Adder.	2 M
4.	What is Floating-Point Representation?	2 M
5.	What is Variable Instruction Formats?	2 M
6.	Characteristics of I/O interface.	2 M
7.	Define writeback.	2 M
8.	What is pipeline throughput and speedup?	2 M
9.	Define interleaved memory.	2 M
10.	What is cache size vs block size?	2 M

PART-B
Answer the following.Each question carries TEN Marks.　5x10=50M

11.A).	Explain about Addressing modes.	10M
	OR	
11. B).	Explain Instruction Execution Cycle phases.	10M
12. A).	Explain the signed number Representation and fixed and floating point representation.	10M
	OR	
12. B).	Explain Division Restoring Technique with an example.	10M
13. A).	Write about Hardwired Control Unit and Microprogrammed control unit.	10M
	OR	
13. B).	Explain about direct memory access (DMA).	10M
14. A).	Discuss Parallel processing in detail.	10M
	OR	
14. B).	Which factors affects the performance of pipelines explain.	10M
15. A).	Explain about the cache memory mapping.	10M
	OR	
15. B).	i) Discuss memory hierarchy in detail.	5M
	ii) Write about replacement algorithms.	5M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations December-2024
Course Name: Object Oriented Programming
(Computer Science & Engineering)

Date: 24.12.2024 AN　　　　Time: 3 hours　　　　Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.　　　　10x2=20M

1.	Define Object Oriented Programming.	2 M
2.	What is Inheritance.	2 M
3.	Define Class.	2 M
4.	Differentiate between Error and Exception.	2 M
5.	Define Multithreading.	2 M
6.	List out File operations.	2 M
7.	Discuss framework.	2 M
8.	Define Vector.	2 M
9.	What is an Event Listener?	2 M
10.	What is the purpose of Adapter Class?	2 M

PART-B
Answer the following. Each question carries TEN Marks.　　　　5x10=50M

11.A).	Explain characteristics of object-oriented languages.	10M
	OR	
11. B).	Industrial the steps for creating and accessing a package.	10M
12. A).	Outline the benefits of exception handling.	10M
	OR	
12. B).	Write about uses of inner classes with an example program.	10M
13. A).	Explain life cycle of a thread with a neat diagram.	10M
	OR	
13. B).	Explain text input and output in files.	10M
14. A).	Explain Hash table with example program.	10M
	OR	
14. B).	Explain JDBC drivers with a neat diagram.	10M
15. A).	Explain JApplet with example.	10M
	OR	
15. B).	With example explain handling button click event.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations December-2024

Course Name: Operating Systems

(CSD)

| Date: 17.12.2024 AN | Time: 3 hours | Max.Marks: 70 |

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	What is multiprogramming? Give an example.	2 M
2.	Mention the key services provided by an operating system.	2 M
3.	Differentiate between user-level and kernel-level threads.	2 M
4.	What is the function of the dispatcher in CPU scheduling?	2 M
5.	Differentiate between deadlock prevention and avoidance.	2 M
6.	Define a semaphore and its types.	2 M
7.	State the difference between contiguous allocation and paging.	2 M
8.	Define virtual memory.	2 M
9.	Outline the functions of the create and close system calls.	2 M
10.	Differentiate between contiguous and linked allocation methods.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).   Outline the primary components of an operating system and discuss the function of each   10M
component briefly.

OR

11. B).   Explain the role of system calls in an operating system, including an example of how   10M
system calls interact with hardware components?

12. A).   Illustrate the role of system calls in process management by explaining the operations of   10M
fork(), wait(), exec(), and exit(), with code examples.

OR

12. B).   A system has five processes P1, P2, P3, P4, and P5, which arrive at time 0 with the   10M
following burst times:

Process	Burst Time (ms)
P1	10
P2	1
P3	2
P4	1
P5	5

Calculate the completion time, waiting time, and turnaround time for each process and
find the average waiting time and average turnaround time for each of the following
scheduling algorithms: First-Come First-Served (FCFS), Shortest Job First (SJF) (Non-
Preemptive), Round Robin (RR) with a time quantum of 2 ms.

(P.T.O..)

13. A). Demonstrate deadlock prevention techniques with examples, explaining how each prevents a deadlock situation. 10M

OR

13. B). Consider a system with 5 processes and 3 types of resources where each resource type has a limited number of instances. The available resources are: (R1 =10, R2=5, R3=7) 10M

The maximum demand and allocated resources for each process are shown below:

Process	Maximum (R1, R2, R3)	Allocation (R1, R2, R3)
P0	(7, 5, 3)	(0, 1, 0)
P1	(3, 2, 2)	(2, 0, 0)
P2	(9, 0, 2)	(3, 0, 2)
P3	(2, 2, 2)	(2, 1, 1)
P4	(4, 3, 3)	(0, 0, 2)

Apply the Banker's algorithm to a given set of resources and processes, showing step-by-step calculations and justifications for safe or unsafe states.

14. A). Compare and contrast segmentation and paging, highlighting their primary uses in memory management. 10M

OR

14. B). Explain the concepts of logical and physical address space with a suitable example. 10M

15. A). Discuss directory structures in detail, comparing single-level, two-level, tree-structured, and acyclic graph directories. Highlight the strengths and limitations of each with diagrams. 10M

OR

15. B). Outline the usage of system calls such as stat, open, close, and ioctl. Provide a brief example for each. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations December-2024

Course Name: Numerical Methods & Complex Variables
(Common for EEE & ECE)

Date: 17.12.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1. Find the Laplace transform of $e^{2t} + 4t^3 - 2\sin 3t$.   2 M
2. Find the Laplace transform of $e^{-3t}(3\sin 2t - 5\cosh 2t)$.   2 M
3. Find a positive root of the equation $x^3 - 4x - 9 = 0$ using Bisection method in two steps.   2 M
4. Write Newton's forward Difference formulae.   2 M
5. Evaluate $\int_0^1 x^3 dx$ with five sub-intervals by Trapezoidal Rule.   2 M
6. Write Picard's Formulae.   2 M
7. Write C-R Equations in Cartesian form.   2 M
8. Define analytic function with example.   2 M
9. Define Zero's, Poles of a function.   2 M
10. State Liouville's Theorem.   2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Using Laplace Transform, Solve $(D^2 + 4D + 5)y = 5$ given that $y(0) = 0$, $y^1(0) = 0$.   10M

OR

11. B).
i) Solve (i) $L\left(\int_0^t \dfrac{e^t \sin t}{t} dt\right)$ 5M

ii) Solve (ii) $L\left(\int_0^\infty e^{-4t} \sin 3t\, dt\right)$ 5M

12. A). Find a Real root of The Equation $xe^x - \cos x = 0$ using Newton-Raphson method.   10M

OR

12. B). Using Lagrange's Formula, find the value of y(10) from the following table: 10M

X	5	6	9	11
Y	12	13	14	16

13. A). Find $y(0.1)$, $y(0.2)$ Using Runge-Kutta 4th order formula given that $\dfrac{dy}{dx} = x^2 - y$, $y(0) = 1$.   10M

OR

13. B). Solve $\dfrac{dy}{dx} = x - y^2$, $y(0) = 1$ using Taylor's series method and compute $y(0.1)$, $y(0.2)$.   10M

(P.T.O..)

14. A). If $u = e^x[(x^2 - y^2)\cos y - 2xy\sin y]$ is real part of an analytic function, find the analytic function.   10M

OR

14. B). Show that the function $u = 2\log(x^2 + y^2)$ is harmonic and find its harmonic conjugate.   10M

15. A). Evaluate $\int_c \dfrac{ze^z}{(z^2+9)}\, dz$ where c is $|z| = 5$ by residue theorem.   10M

OR

15. B). Obtain the Laurent's series expansion of $f(z) = \dfrac{e^z}{z(z-1)}$ about $Z=1$.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations December-2024
Course Name: Numerical Techniques & Probability Distributions
(Common for CSM, AID & AIM)

Date: 19.12.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	What is algebraic equation? Give an example.	2 M
2.	Define Newton forward interpolation formula.	2 M
3.	Write the formula of Trapezoidal rule and Simpson's 1/3 Rule.	2 M
4.	Write the Euler's Modified formula.	2 M
5.	Find the Laplace transform of $t^3 + 5cost$.	2 M
6.	State the convolution theorem.	2 M
7.	Write any two conditions of Binomial Distribution.	2 M
8.	If $\mu = 5$ and $\sigma = 2$ what is the equation of Normal distribution?	2 M
9.	Write about one tailed and two tailed tests.	2 M
10.	Write the applications of χ^2-distribution.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). Find a real root of the equation $x^3 - 2x - 5 = 0$ by Regula-Falsi method.   10M

OR

11. B). Apply Lagrange's interpolation formula to find $f(5)$ given that $f(1) = 2$, $f(2) = 4, f(3) = 8, f(4) = 16, f(7) = 128$.   10M

12. A). Evaluate $\int_0^2 e^{-x^2} dx$ using Trapezoidal & Simpson's 1/3rd Rule of integration with h=0.25.   10M

OR

12. B). Apply Runge-Kutta Fourth order method to solve $y' = \frac{y-x}{y+x}, y(0) = 1$ also compute $y(0.1)$ and $y(0.2)$.   10M

13. A). Find the Laplace transform of (i) $e^{-3t}(2cos5t - 3sin5t)$ (ii) $\frac{e^{-at}-e^{-bt}}{t}$ 10M

OR

13. B). Using Laplace transform, solve $y'' + 2y' - 3y = sint, \ y(0) = y'(0) = 0$ 10M

14. A). Fit a Poisson distribution to the following data   10M

x	0	1	2	3	4	5
$f(x)$	142	156	69	27	5	1

OR

14. B). In a Normal distribution, 7% of the items are under 35 and 89% are under 63. Determine mean and variance of the distribution.   10M

(P.T.O..)

15. A). In a city A, 20% of random sample of 900 school boys had a certain slight physical   10M
defect. In another city B, 18.5% of a random sample of 1600 school boys had the same
defect. Is the difference between the proportions significant at 5% level of significance?

OR

15. B). A random sample of 10 boys had the following I.Q'S:70, 120, 110, 101, 88, 83, 95, 98,   10M
107 and 100 do these data support the assumption of a population mean I.Q., of 100 ?

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations December-2024
Course Name: Design & Analysis of Algorithms
(Common for CSC & CSD)

Date: 19.12.2024 AN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.   **10x2=20M**

1.	State Master Theorem.	2 M
2.	Define Ω-notation.	2 M
3.	List the differences between divide and conquer and Greedy method.	2 M
4.	Write control abstraction of Greedy method.	2 M
5.	What is Huffman Coding?	2 M
6.	Explain Graph Coloring Problem.	2 M
7.	Explain Topological order with an example.	2 M
8.	Define BFS.	2 M
9.	Define P,NP,NP-Hard and NP-Complete problems.	2 M
10.	List the NP-Complete problems.	2 M

PART-B
**Answer the following. Each question carries TEN Marks.**   **5x10=50M**

11.A).   What is Recurrence Tree method? Write the steps to Solve Recurrence Relations. Show the Recurrence relation for $T(n) = T(n/10) + T(9n/10) + n$.   **10M**

OR

11. B).   i) Explain the process of designing an algorithm. Give characteristics of an algorithm.   **4M**
ii) Explain Asymptotic notations.   **6M**

12. A).   Solve the knapsack problem for the following problem:P={11,21,31,33,43,53,55,65}, w={1,11,21,23,33,43,45,55}, m=110, n=8.   **10M**

OR

12. B).   Explain Strassen Matrix Multiplication with an example.   **10M**

13. A).   Solve the travelling salesman problem for the following.   **10M**
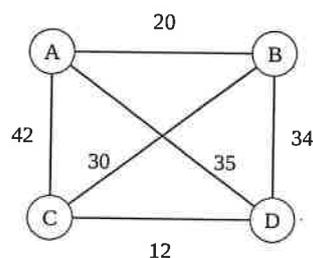
OR

13. B).   Draw the portion of the state space tree generated by FIFO for the given knapsack problem instance. N=5,(p1,p2,p3,p4,p5)=(10,15,6,8,4), (w1,w2,w3,w4,w5)=(4,6,3,4,2) and m=12.   **10M**

(P.T.O..)
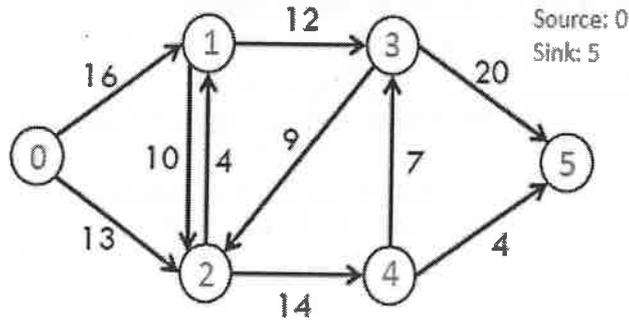
14. A). Explain Prims and Kruskal algorithms with an example.   10M

<p align="center">OR</p>

14. B). Find maximum flow for the graph given.   10M

15. A). Discuss in detail about the class P, NP, NP-hard and NP-complete problems. Give examples for each class.   10M

<p align="center">OR</p>

15. B). Write short notes on Satisfiability Problems.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations December-2024
Course Name: Statistical Foundations of Data Science
(CSD)

Date: 21.12.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.   **10x2=20M**

1. What are the elements of structured data. How many types of structured data are there. — 2 M

2. What are non-rectangular data structures. Which of the following is the fundamental building block of predictive modeling and why: Rectangular data or Non-rectangular data. — 2 M

3. What is Poisson distribution. Is it discrete or continuous. — 2 M
   A car hire firm has two cars which it fires out day by day. The number of demands for a car on each day is distributed as Poisson variate with mean 1.5. Calculate the proportion of days on which (i) neither car is used, and (ii) some demand is refused.

4. What is a Long-tailed distribution. Why this distribution should be used. — 2 M

5. What is A/B testing? Where are A/B tests popular. — 2 M

6. What are Null hypothesis and Alternate hypothesis. Give an example. — 2 M

7. What is simple Linear regression. What are fitted values and residuals. Where are they used. — 2 M

8. What are least squares. How the given equation is solved by the method of least squares. — 2 M

9. What is an outlier. What are influential values. Give an example. — 2 M

10. What are splines. What are they used for? Give an example. — 2 M

PART-B
Answer the following. Each question carries TEN Marks.   **5x10=50M**

11.A). i) What are the points to be borne in mind in the formation of frequency table? Choosing appropriate class-intervals, build a frequency table for the following data: — 5M
10.2 0.5 5.2 6.1 3.1 6.7 8.9 7.2 8.9 5.4 3.6 9.2 6.1 7.3
2.0 1.3 6.4 8.0 4.3 4.7 12.4 8.6 13.1 3.2 9.5 7.6 4.0 5.1
8.1 1.1 11.5 3.1 6.8 7.0 8.2 2.0 3.1 6.5 11.2 12.0 5.1 10.9 11.2 8.5 2.3 3.4
5.2 10.7 4.9 6.2

ii) A collar manufacturer is considering the production of a new style collar to attract young men. The following statistics of neck circumference are available based on the measurement of a typical group of students: — 5M

Mid-value in inches :	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0
No. of students :	4	19	30	63	66	29	18	1

Compute the mean, range and standard deviation.

OR

11. B). i) Draw a histogram for the following data: — 5M

Age (in years) :	2-5	5-11	11-12	12-14	14-15	15-16
No. of boys:	6	6	2	5	1	3

ii) What are Scatterplots. Evaluate the Karl Pearson's correlation coefficient for the following heights (in inches) of fathers (X) and their sons(Y): — 5M

X:	65	66	67	67	68	69	70	72
Y:	67	68	65	68	72	72	69	71

(P.T.O..)

12. A). What is t-distribution. When is it used and why should it be used. It is believed that the precision (as measured by the variance) of an instrument is no more than 0.16. Write down the null and alternative hypothesis for testing this belief. Carry out the test at 1% level, given 11 measurements of the same subject on the instrument; 2.5, 2.3, 2.4, 2.3, 2.5, 2.7, 2.5, 2.6, 2.6, 2.7, 2.5. **10M**

OR

12. B). The following table gives the number of aircraft accidents that occurs during the various days of the week. Find whether the accidents are uniformly distributed over the week using chi-square distribution. **10M**

Days:	Sun.	Mon.	Tues.	Wed.	Thurs.	Fri.	Sat.
No. of accidents:	14	16	8	12	14	14	14

13. A). The means of two single large samples of 1000 and 2000 members are 67·5 inches and 68·0 inches respectively. Can the samples be regarded as drawn from the same population standard deviation 2·5 inches? (Test at 5% level of significance). **10M**

OR

13. B). Measurements of the fat content of two kinds of ice cream, Brand A and Brand B, yielded the following sample data: **10M**

Brand A:	13.5	14.0	13.6	12.9	13.0
Brand B:	12.9	13.0	12.4	13.5	12.7

Test the null hypothesis $\mu_1 = \mu_2$, (where μ_1 and μ_2 are the respective true average fat contents of the two kinds of ice cream), against the alternative hypothesis $\mu_1 \neq \mu_2$ at the level of significance $\alpha = 0.05$.

14. A). What is multiple linear regression. Explain how the models are assessed and how cross-validation is done for the model. Also, explain about model selection and elaborate the steps in stepwise regression. **10M**

OR

14. B). What is the difference between linear regression and multiple linear regression. Can $Y = 5 + 2.8 X$ and $X = 3 - 0.5 Y$ be the estimated regression equations of Y on X and X on Y respectively? Explain your answer with suitable theoretical arguments. **10M**

15. A). How to interpret the given data using regression equation. Why do we have, in general, two lines of regression? Obtain the regression of Y on X, and X on Y from the following table and estimate the blood pressure when the age is 45 years. **10M**

Age in years (X)	Blood pressure (Y)
56	147
42	125
72	160
36	118
63	149
47	128
55	150
49	145
38	115
42	140
68	152
60	155

OR

15. B). What are Generalized Additive models. How to Fit a spline regression to the given set of data ? **10M**

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations December-2024
Course Name: Object Oriented Programming Through JAVA
(Common for CSC, CSM, AID & AIM)

Date: 24.12.2024 AN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)
PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	Define scope and lifetime of variable in java.	2 M
2.	What is the use of 'this' in java?	2 M
3.	Define the use of static keyword.	2 M
4.	Distinguish throw and throws.	2 M
5.	Distinguish Multiprocessing and Multi-threading.	2 M
6.	Define stream.	2 M
7.	Define Queue interface.	2 M
8.	List types of JDBC drivers.	2 M
9.	Define grid layout with example.	2 M
10.	Define adapter class.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A). List different types of inheritances in java. Explain each of them in detail with an example program.   10M

OR

11. B). Create a java program to explain method overloading and method overriding.   10M

12. A). Define the use of Anonymous inner classes. Explain with example program.   10M

OR

12. B). Explain in detail about exception handling mechanism with an example program.   10M

13. A). Define a Thread. Explain thread life cycle with a neat diagram.   10M

OR

13. B). Create a java program to read and display contents from a file.   10M

14. A). i) Define any four methods of string Tokenizer class with example.   4M
    ii) Explain the methods in List interface with example.   6M

OR

14. B). What is JDBC? Explain different types of JDBC drivers.   10M

15. A). Explain the hierarchy of swing class in JAVA.   10M

OR

15. B). Explain Mouse events with example.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations Dec-2024/Jan-2025
Course Name: Basic Electrical Engineering
(CSM)

Date: 07.01.2025 FN	Time: 3 hours	Max.Marks: 70

(Note: Assume suitable data if necessary)
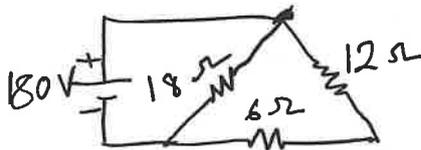### PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1. Find the current through 6Ω resistor of the following circuit.   2 M


2. Describe the Norton theorem and its relationship with the Thevenin theorem.   2 M
3. Why transient occurs in electric circuits?   2 M
4. Define form factor and peak factor.   2 M
5. What is meant by Stator? What is meant by Rotor?   2 M
6. How to minimize the Eddy Current Losses?   2 M
7. Why is transformer rated in KVA?   2 M
8. Draw the exact equivalent circuit of a transformer.   2 M
9. Why is the induction motor called asynchronous motor?   2 M
10. List the various methods speed control of 3 phase induction motor.   2 M

PART-B
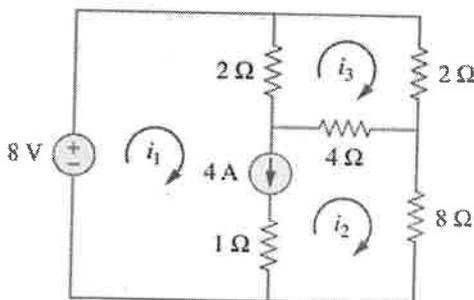**Answer the following. Each question carries TEN Marks.**   5x10=50M

11.A). Write the node equations for the circuit shown.   10M
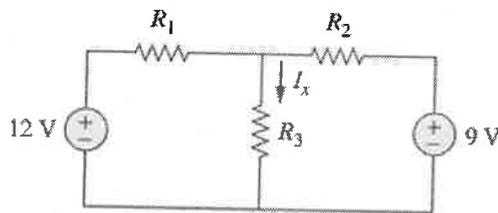
OR

11. B). Use mesh analysis to determine i_1, i_2 and i_3 in fig.   10M

(P.T.O..)

12. A). What is the transient response of series and RC circuits with D.C excitation?   10M

OR

12. B). Derive the Transient Response of series RL-circuit with D.C excitation.   10M

13. A). Explain the principle of operation of a D.C motor. Derive the equation for the torque   10M
Developed by a D.C. motor?

OR

13. B). Distinguish between generator and motor action. Derive the equation for the back e.m.f of   10M
DC motor.

14. A). Compare the results and procedure of O.C., S.C. tests and back to back tests conducted on   10M
transformer.

OR

14. B). Explain the working principle and operation of single phase transformer.   10M

15. A). Explain the Torque-Slip characteristics of a 3-phase Induction motor.   10M

OR

15. B). Explain the working principle and operation of 3 phase induction motor.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations Dec-2024/Jan-2025
Course Name: Basic Electrical and Electronics Engineering
(Common for CE & ME)

Date: 07.01.2025 FN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	Define Ohms law.	2 M
2.	List the examples of Indicating instruments.	2 M
3.	Classify the types of DC motors.	2 M
4.	What is the importance of three point starter in DC machine?	2 M
5.	What are the losses present in transformer?	2 M
6.	Mention the applications of Induction motors.	2 M
7.	Explain the objective of diode.	2 M
8.	How the transistor working as an amplifier?	2 M
9.	How is CRO superior to ordinary measuring instruments?	2 M
10.	What are the essential components of a CRT?	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	Derive the relationship between star and delta connections.	10M
	OR	
11. B).	Analyze superposition theorem with suitable example.	10M
12. A).	Explain the working principle of a D.C. motor.	10M
	OR	
12. B).	Derive EMF equation of a DC generator (or DC machine).	10M
13. A).	Develop an expression for the EMF induced in a transformer winding.	10M
	OR	
13. B).	Discuss in brief working principle of induction motor.	10M
14. A).	Explain forward biasing and reverse biasing of a PN junction with neat characteristics.	10M
	OR	
14. B).	Describe the operation of half wave rectifier with neat circuit diagram.	10M
15. A).	Explain what is meant by the deflection sensitivity of a CRO.	10M
	OR	
15. B).	Illustrate the principle operation of CRT with neat diagram.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations Dec-2024/Jan-2025
Course Name: Database Management Systems
(Common for CSE, IT, CSC & CSD)

Date: 07.01.2025 FN   Time: 3 hours   Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A
Answer all TEN questions
Each question carries TWO marks.   10x2=20M

1.	What are the applications of database system?	2 M
2.	Explain the three levels of abstraction.	2 M
3.	Explain views in SQL language.	2 M
4.	What is an active database?	2 M
5.	What is Schema Refinement?	2 M
6.	Write the properties of Decomposition.	2 M
7.	Define Serializability.	2 M
8.	Write about transaction states.	2 M
9.	What is an indexing and hashing?	2 M
10.	Give a brief note on Static Hashing.	2 M

PART-B
Answer the following. Each question carries TEN Marks.   5x10=50M

11.A).	Explain about various database users and administrators in DBMS.	10M
	OR	
11. B).	What is E-R model? Draw an E-R Diagram for any Banking enterprise system.	10M
12. A).	What are aggregate operators that SQL support? Explain with an example.	10M
	OR	
12. B).	What is trigger? Explain how to implement triggers in SQL?	10M
13. A).	Define lossless join decomposition with example.	10M
	OR	
13. B).	Compare tuple relational calculus and Domain relational calculus.	10M
14. A).	What is meant by remote backup system?	10M
	OR	
14. B).	When two schedules are conflict equivalent. What is conflict serializability schedule?	10M
15. A).	Explain deletion and insertion operations in linear hashing with examples.	10M
	OR	
15. B).	Give a Comparison of various File Organizations.	10M

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