CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations August-2023
Course Name: DISCRETE MATHEMATICS
(Common for CSE, IT, CSC & CSM)

Date: 08.08.2023 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. If R = {(0,0), (2,2), (4,4)} is an equivalence relation on {0,2,4} then find the equivalence class.   2 M

2. Define Bijective function with example.   2 M

3. Define greatest common divisor.   2 M

4. Find the number of 3 combinations of 5 objects with unlimited repetitions.   2 M

5. Define the connectives NAND and NOR.   2 M

6. Write a short note on well Formed Formulas.   2 M

7. Define Monoid.   2 M

8. Find the dual of the Boolean function $x \vee (y \wedge F)$.   2 M

9. Define Chromatic number of a Graph.   2 M

10. Define Hamilton path and Hamilton cycle.   2 M

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

11.A). Let S be the set of all non- zero integers, and A = S X S. On A, define the relation R by (a, b) R (c, d) if and only if ad = bc. Show that R is an equivalence relation.   10M

OR

11. B). Let A = {1, 2, 3, 4, 6, 12}. On A, define the relation R by aRb if and only if a divides b. Prove that R is partial order on A.   10M

12. A). How many arrangements are there for the word MISSISSIPPI with no two pair consecutive same letters.   10M

OR

12. B). Find how many integers between 1 and 1000 are not divisible by 2, 3, 5 or 7.   10M

13. A). For any three propositions p, q, r, construct the truth table for the proposition $(p \rightarrow q) \vee (p \rightarrow r)$.   10M

OR

13. B). Write down the following proposition in symbolic form and find its negation: "If all triangles are right-angled, then no triangle is equiangular".   10M

(P.T.O..)

14. A). Define the Ring and Field with example. 10M

<div align="center">**OR**</div>

14. B). If * is an operation on Z defined by x * y = x + y + 1, prove that (Z, *) is an abelian group. 10M

15. A). State and prove Euler's formula. 10M

<div align="center">**OR**</div>

15. B). Show that a simple undirected graph G is a tree if and only if G is connected and contains no cycles. 10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations August-2023
Course Name: NUMERICAL TECHNIQUES & PROBABILITY DISTRIBUTIONS
(Common for CSM, AID & AIM)

Date: 10.08.2023 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 $\sqrt{5}$ using Newton-Raphson method. 2 M
2. Show that $(\Delta - \nabla)f(x) = (\Delta\nabla)f(x)$, where Δ and ∇ are forward and backward difference operators. 2 M
3. Evaluate $\int_3^{12} f(x)dx$ using Simpson's 1/3rd rule for the following data: 2 M

x	3	6	9	12
f(x)	-1	1	2	3

4. Using Euler's method, find y (0.1) for $\frac{dy}{dx} = y - 2x$, $y(0) = 1$. 2 M
5. Find $L(t \cos at)$. 2 M
6. Find inverse Laplace transform of $\frac{1}{(s+a)(s+b)}$. 2 M
7. The mean and variance of Binomial distribution are 4.5 and 1.125 respectively. Then find $P(X \geq 1)$. 2 M
8. Define Statistic and Parameter. 2 M
9. Define Type-I and Type-II errors. 2 M
10. Write the test statistic for t- test for two means. 2 M

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

11.A). i) Find 4 iterations of $\cos x = xe^x$ using Regula-Falsi Method up to 4 decimal places. 5M

   ii) Find y(2.4) using Newton's backward Interpolation formula from the following data: 5M

x	0	1	2	3
y	1	2	1	10

OR

11. B). A curve $y = f(x)$ passes through the points (0, 18), (1, 10), (3, -18) and (6, 90). Find the slope of the curve at $x = 2$ using Lagrange's Interpolation Formula. 10M

12. A). Evaluate $\int_0^1 \frac{dx}{1+x^2}$ by using i) Trapezoidal rule ii) Simpson's 1/3rd rule and iii) Simpson's 3/8th rule by taking h = $\frac{1}{6}$ 10M

OR

12. B). Solve the differential equation $\frac{dy}{dx} = 1 + 2xy$, given y (0) = 0 using Runge-Kutta Method of order 4, and compute y (0.1) and y (0.2). 10M

(P.T.O..)

13. A). i) Define Periodic function and hence find its Laplace transform.   5M

ii) Find Inverse Laplace Transform of $\dfrac{s}{(s^2+a^2)^2}$ 5M

<center>OR</center>

13. B). Apply Laplace Transform, to Solve the differential equation: 10M

$\dfrac{d^2y}{dx^2} + 2\dfrac{dy}{dx} - 3y = sinx, y = \dfrac{dy}{dx} = 0 \ when \ x = 0.$

14. A). In a sample of 1000 cases, the mean of certain test is 14 and standard deviation is 2.5.   10M
Assuming the distribution to be normal, determine how many score
   (i)   Between 12 to 15
   (ii)   Above 18
   (iii)   Below 8 and (iv) Below 16

<center>OR</center>

14. B). Construct(fit) a Poisson distribution to the following data   10M

x	0	1	2	3	4
f	46	38	22	9	1

15. A). Random samples of 400 men and 600 women were asked whether they would like to have   10M
a flyover near their residence. 200 men and 325 women were in favour of the proposal.
Test the hypothesis that proportions of men and women in favour of the proposal are
same, at 5% level of significance.

<center>OR</center>

15. B). Two types of drugs were used on 5 and 7 patients for reducing their weights. Drug A was   10M
imported and Drug B was indigenous, the decrease in the weight after using the drug for 6
months was as follows

Drug A	10	12	13	11	14		
Drug B	8	9	12	14	15	10	9

Is there a significant difference in the efficiency of the two drugs. If not, which drug
should you buy. Test at 5% level of significance.

(t- table value is $\left|t_{\vartheta=10, \ \alpha=0.05}\right| = 2.228$)

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations August-2023
Course Name: COMPUTER ORGANIZATION & ARCHITECTURE
(Common for CSE, IT, CSC, CSM, AID & AIM)

Date: 12.08.2023 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 different phases of an Instruction Cycle?	2 M
2.	What are input output instructions?	2 M
3.	Write short notes about floating point data representation with example.	2 M
4.	List the different Shift Micro operations.	2 M
5.	What are the major types of Interrupts?	2 M
6.	Distinguish between hardwired control and microprogrammed control unit.	2 M
7.	Define parallel processing.	2 M
8.	Explain pipeline hazard.	2 M
9.	Write about virtual memory.	2 M
10.	Define Memory Interleaving with example.	2 M

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

11.A).	What is RTL? Explain with suitable examples? What is its significance Instructions?	10M
	OR	
11. B).	Explain about Addressing modes with example.	10M
12. A).	Explain booth's multiplication algorithm with example.	10M
	OR	
12. B).	Illustrate the process of fixed point addition and subtraction with a flow chart.	10M
13. A).	Explain about micro programmed control unit with block diagram.	10M
	OR	
13. B).	Discuss the need for DMA. Explain DMA controller in computer system.	10M
14. A).	Explain briefly about arithmetic pipeline.	10M
	OR	
14. B).	i) Discuss the demerits of pipeline processing.	5M
	ii) Demonstrate cache coherency with example.	5M
15. A).	What is the significance of cache memory and write about direct and associative mapping techniques.	10M
	OR	
15. B).	Compare cache size Vs Block size with examples.	10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)
B.Tech III Semester Supplementary Examinations August-2023
Course Name: **OBJECT ORIENTED PROGRAMMING THROUGH JAVA**
(Common for CSC, CSM, AID & AIM)

Date: 17.08.2023 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 object oriented programming?	2 M
2.	List out the features of java.	2 M
3.	What is Exception Handling?	2 M
4.	Define inner class.	2 M
5.	Distinguish multi threading and multi tasking.	2 M
6.	Write a note on thread states.	2 M
7.	List the methods of Random class.	2 M
8.	Name types of JDBC drivers in Java.	2 M
9.	Define event and list out the event sources.	2 M
10.	Define delegation event model.	2 M

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

11.A). What is interface? Write a program to demonstrate how interfaces can be extended.   10M

OR

11. B). Write a sample program to illustrate creating and importing packages.   10M

12. A). List out the benefits of exception handling mechanism in java and differentiate checked and unchecked exceptions.   10M

OR

12. B). Explain throws statement in Java with the help of an example program.   10M

13. A). What is the difference between byte streams and character streams? How are they used to capture input from the user?   10M

OR

13. B). List benefits of multithreading? How we set priority to threads. Explain with suitable program.   10M

14. A). Explain String Tokeinzer and Scanner classes with example programs.   10M

OR

14. B). What is an importance of JDBC? Give an example program to connect database with java?   10M

15. A). What is the significance of Layout managers? Discuss briefly any two layout managers.   10M

OR

15. B). Demonstrate JApplet and JPanel with example programs.   10M

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CMR COLLEGE OF ENGINEERING & TECHNOLOGY
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B.Tech III Semester Supplementary Examinations August-2023
Course Name: BASIC ELECTRICAL ENGINEERING
(Common for CSM & AIM)

Date: 19.08.2023 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 current.	2 M
2.	State superposition theorem.	2 M
3.	Define peak factor.	2 M
4.	Write an expression for form factor of sinusoidal waveform.	2 M
5.	Classify DC motors.	2 M
6.	Write an expression for generated emf of DC generator.	2 M
7.	What is an expression of emf for transformer?	2 M
8.	Draw equivalent circuit of transformer.	2 M
9.	What is the significance of torque-slip characteristics of three phase induction motor?	2 M
10.	Classify single phase induction motors.	2 M

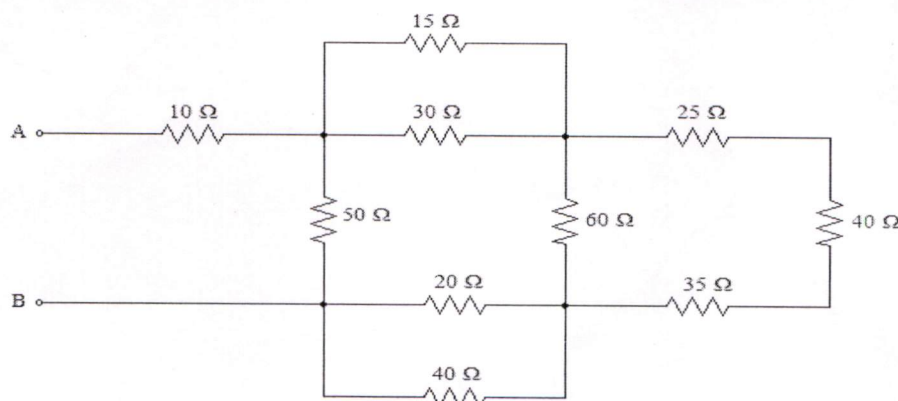**PART-B**

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

11.A).   Explain Kirchhoff's Voltage and Current Law.   10M

OR

11. B).   Determine the equivalent resistance between the terminals A and B in the given circuit.   10M

12. A).   Derive the Average Value of Sine waveform.   10M

OR

12. B).   Define the following: (i) Time period (ii) Frequency (iii) Average value (iv) RMS value and (v) form factor.   10M

(P.T.O..)

13. A). With neat sketch explain the construction and working of each part in detail of DC machine. 10M

OR

13. B). An 8 pole DC Motor has 500 conductors in its armature. The flux per pole is 0.05wb. Determine (i) Back emf for 1200rpm motor speed and lap connection (ii) Back emf for 500rpm motor speed and wave connection (iii) Motor Speed for 220V back emf and lap connection (iv) Motor Speed for 200V back emf and wave connection. 10M

14. A). Explain the construction of a transformer. 10M

OR

14. B). Compare Step-Down Transformer & Step-Up Transformer. 10M

15. A). Explain the principle of operation of three phase Induction Motor. 10M

OR

15. B). A 6 pole, 50Hz, 3 Phase Induction Motor is running at 1400 rpm. Determine: (i) Synchronous Speed (ii) Slip (iii) Rotor Frequency. 10M

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