

H.T No:

--	--	--	--	--	--	--	--	--	--

R18

Course Code: A30506



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Regular & Supplementary Examinations Feb/March -2023

Course Name: DISCRETE MATHEMATICS

(Common for CSE, IT, CSC & CSM)

Date: 20.02.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. Find the relation R on $\{1, 3, 5\}$ is such that $x R y$ if and only if $y = x + 2$. 2 M
2. Find the power set of $A = \{1, 2, 3\}$. 2 M
3. State pigeonhole principle. 2 M
4. Find the number of ways of placing 10 similar balls in 6 number boxes. 2 M
5. Define Tautology and Contradiction. 2 M
6. Define free and bounded variables. 2 M
7. Define semi group. 2 M
8. In a Boolean algebra, show that $x + (x \cdot y) = x$. 2 M
9. Define Hamiltonian cycle with example. 2 M
10. State the Euler's Formula. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). If R and S are transitive relations on a set A, then show that $R \cap S$ is transitive. 10M
- OR
11. B). Find an equivalence relation on a set $\{1,2,3\}$ corresponding to the partition $\{\{1, 3\},\{2\}\}$. 10M
12. A). Explain power set theorem with example. 10M
- OR
12. B). In how many ways can the letters $\{5a, 4b, 3c\}$ be arranged so that all the letters of the same kind are not in a single block. 10M
13. A). Show that the implication $(p \rightarrow q) \rightarrow q \Rightarrow p \vee q$ using rules of inference. 10M
- OR
13. B). i) Define Existential and Universal quantifiers with examples. 4M
ii) List and explain different types of proof techniques with example. 6M
14. A). Express the function $(x \wedge y) \vee (\sim x \wedge \sim y)$ into conjunctive normal form. 10M
- OR
14. B). Show that $\{1, -1, i, -i\}$ is an abelian group with respect to multiplication operation. 10M

(P.T.O..)

15. A). State and prove fundamental theorem of graph theory.

10M

OR

15. B). i) Show that a complete graph K_n is planar if and only if $n \leq 4$.

4M

ii) Take any two graphs and check whether those graphs are isomorphic to each other or not? Justify your answer.

6M

H.T No:

R18

Course Code: A30007



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Regular & Supplementary Examinations Feb/March-2023
Course Name: NUMERICAL TECHNIQUES & PROBABILITY DISTRIBUTIONS
(Common for CSM, AID & AIM)

Date: 22.02.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. Find an interval which contains a real root of $x^3 - 2x - 5 = 0$. 2 M
2. If $f(x) = x(x-1)(x-2)$, then find $\nabla(f(x))$, with step length $h = 1$. 2 M
3. Differentiate between Simpson's 1/3 rule and 3/8 rule. 2 M
4. What is the drawback of Picard's method? 2 M
5. Find Laplace transform of the function $e^{2t} + 4t^3 - 2 \sin 3t + 3 \cos 3t$. 2 M
6. State first shifting property of Laplace transforms. 2 M
7. Define discrete random variable and continuous random variable. 2 M
8. A population consists of five numbers 2, 3, 6, 8, 11. Consider all possible samples of size 2 which can be drawn with replacement from this population. Find the mean of the population and mean of the sampling distribution of means. 2 M
9. Define Type-I and Type-II errors. 2 M
10. What are the conditions for applying chi-square test? 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). i) Find a root of the equation $2x = \cos x + 3$ correct to three decimal places by Iterative method. 5M
- ii) Find a real root of the equation $x^3 - 2x - 5 = 0$ by Regula-Falsi method and correct to three decimal places. 5M

OR

11. B). i) Find $y(25)$, given that $y(20) = 24$, $y(24) = 32$, $y(28) = 35$ and $y(32) = 40$ using Gauss forward difference formula. 5M
- ii) Using Lagrange interpolation formula find $y(5)$ from the data in the following table. 5M

x	0	2	3	6
y(x)	648	704	729	792

12. A). Consider the function $f(x) = 2x^2 - x$. Calculate the integral of $f(x)$ from $x = 1$ to $x = 2$ with step size of 10^{-1} using Trapezoidal rule. 10M

OR

12. B). Apply Runge-Kutta method to find an approximate value of y for $x = 0.2$ in steps of 0.1, if $\frac{dy}{dx} = x + y^2$ given that $y = 1$ when $x = 0$. 10M

(P.T.O..)

13. A). i) Find $L(t \sin 3t)$ 5M
 ii) Find $L^{-1}\left\{\frac{3s-2}{s^2-4s+20}\right\}$ 5M

OR

13. B). Using Laplace transform, solve $(D^2 + 1)x = t \cos 2t$, given that $x = 0, \frac{dx}{dt} = 0$ at $t = 0$. 10M

14. A). i) A random variable X has the following probability function. Determine k , Mean and Variance of X . 5M

x	0	1	2	3	4	5	6	7
P(x)	0	k	2k	2k	3k	k^2	$2k^2$	$7k^2+k$

- ii) If the probability density of a random variable is given by 5M
 $f(x) = \begin{cases} kx^2; & \text{for } 0 < x < 1 \\ 0; & \text{elsewhere} \end{cases}$, then find 'k' and probability that the random variable takes on a value between $\frac{1}{4}$ and $\frac{3}{4}$.

OR

14. B). i) A discrete random variable X has the mean 6 and variance 2. If the distribution is binomial, find the probability that $5 \leq X \leq 7$ 5M
 ii) In a normal distribution 31% of the items are under 45 and 8% are over 64. Find the mean and the standard deviation of the distribution. 5M

15. A). i) A sample of 400 items is taken from a population whose S.D is 10. The mean of the sample is 40. Test whether the sample has come from a population with mean 38. Also calculate 95% confidence interval for the population. 5M
 ii) Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favour of the proposal. Test the hypothesis that proportion of men and women in favour of the proposal are same at 5% level. 5M

OR

15. B). Two horses A and B were tested according to the time (in seconds) to run a particular track with the following results. 10M

Horse A	28	30	32	33	33	29	34
Horse B	29	30	30	24	27	29	---

Test whether the two horses have the same running capacity?

H.T No:

--	--	--	--	--	--	--	--	--	--

R18

Course Code: A30513



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Regular & Supplementary Examinations Feb/March-2023

Course Name: COMPUTER ORGANIZATION & ARCHITECTURE
(Common for CSE, IT, CSC, CSM, AID & AIM)

Date: 24.02.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

- | | |
|--|-----|
| 1. How Digital modules are built? | 2 M |
| 2. Define instruction set. | 2 M |
| 3. What is purpose of carry save multiplier? | 2 M |
| 4. Mention the purpose of ripple carry adder. | 2 M |
| 5. What are the differences between synchronous and Asynchronous transfer? | 2 M |
| 6. What is an interrupt? | 2 M |
| 7. What is the difference between super pipeline, super scalar pipeline. | 2 M |
| 8. What is cache coherency? | 2 M |
| 9. What is the significance of initializing cache? How is it done? | 2 M |
| 10. Define address space and memory space. | 2 M |

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). What is an instruction? With example explain three, two, one, zero address instructions. 10M

OR

11. B). i) Explain about General register organization with seven registers 5M
ii) Describe the Addressing Modes: a) Direct, b) Relative and c) Register with example. 5M

12. A). i) Dividend A=01110 Divisor B=10001. Explain and perform division restoring algorithm with flowchart. 5M
ii) Explain the Booth's algorithm for multiplication of signed two's complement numbers. 5M

OR

12. B). i) Distinguish between fixed point representation and floating point representation. 5M
ii) Perform the (+21)+(-16) and (-23)+(13) arithmetic operations using 2's complement representation for negative numbers. 5M

13. A). Explain the following modes of transfer in brief 10M
(i) Interrupt initiated I/O
(ii) DMA

OR

13. B). i) Distinguish Hardwired control Vs Micro programmed control. 5M
ii) Write short note on Interrupt driven I/O. 5M

(P.T.O..)

14. A). Write in brief about 10M
(i) Pipeling
(ii) Comparison between RISC and CISC

OR

14. B). i) Mention the categories of multiprocessors? List the major MIMD Styles. 5M
ii) Discuss about Array Processors. 5M

15. A). i) Why page-table is required in a virtual memory system? Explain different ways of organizing a page table. 5M
ii) What do you mean by memory hierarchy? Describe in detail. 5M

OR

15. B). What is a page fault? What does a page fault signify? Explain the different page replacement algorithms which determine the page to be removed in case of full memory. 10M



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Regular & Supplementary Examinations Feb/March-2023

Course Name: OBJECT ORIENTED PROGRAMMING THROUGH JAVA
(Common for CSC, CSM, AID & AIM)

Date: 27.02.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

- | | |
|---|-----|
| 1. List any four features of java. | 2 M |
| 2. What is classpath variable? | 2 M |
| 3. Name the keywords used in Exception Handling. | 2 M |
| 4. List the uses of Inner classes. | 2 M |
| 5. Define multithreading. | 2 M |
| 6. Classify the types of streams. | 2 M |
| 7. List the steps to connect database using JDBC. | 2 M |
| 8. What are Generics and its uses? | 2 M |
| 9. What is AWT? | 2 M |
| 10. Define JApplet. | 2 M |

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- | | |
|--|----------|
| 11.A). What is Inheritance? Explain Method Overriding with suitable example. | 10M |
| OR | |
| 11. B). Define package. Explain the procedure for creating and accessing a package with an example. | 10M |
| 12. A). Develop a java program to read input from the user. If the input is -ve number then program should raise a user defined exception. | 10M |
| OR | |
| 12. B). What are the different types of a Inner classes? Explain Anonymous Inner Class with an example. | 10M |
| 13. A). Explain wait(), notify() and notifyAll() methods for thread communication with example. | 10M |
| OR | |
| 13. B). i) Develop a java program to count number of words, lines and characters in a given file.
ii) Develop a java program to create thread using Thread class. | 5M
5M |
| 14. A). Explain JDBC driver types in detail. | 10M |
| OR | |
| 14. B). Explain ArrayList and HashTable with suitable example. | 10M |
| 15. A). i) List Event Classes and Event Listeners.
ii) Explain various mouse events. | 5M
5M |
| OR | |
| 15. B). Develop a java program to handle mouse events. | 10M |

H.T No:

--	--	--	--	--	--	--	--	--	--

R18

Course Code: A30228



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Regular & Supplementary Examinations Feb/March-2023

Course Name: BASIC ELECTRICAL ENGINEERING

(Common for CSM & AIM)

Date: 01.03.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

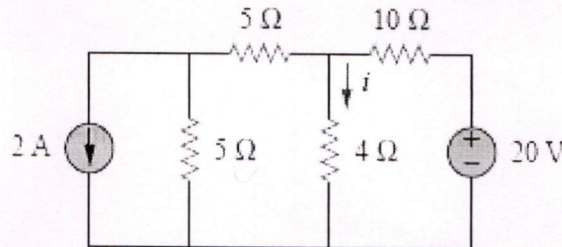
1. State Kirchoff's voltage law. 2 M
2. Mention the properties of inductor and capacitor. 2 M
3. Define phasor which represents a complex electrical quantity. 2 M
4. Write the three voltage equations of a balanced three phase system. 2 M
5. Define Faraday's law of electro-magnetic induction. 2 M
6. Define efficiency of a DC generator. 2 M
7. What is an Ideal Transformer? 2 M
8. List out different losses in a Transformers. 2 M
9. What are the types of three-phase Induction motors? 2 M
10. Classify different types of single-phase induction motors. 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

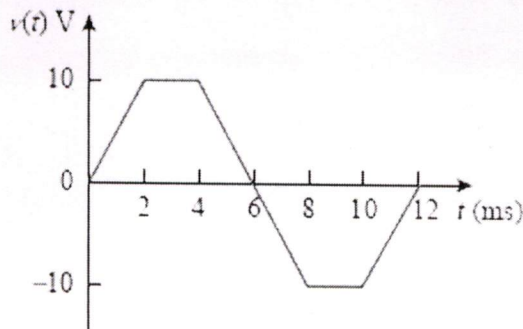
- 11.A). For the circuit shown below, use source transformation to find i . 10M



OR

11. B). State and explain the maximum power transfer theorem. 10M

12. A). Determine the effective value of the periodic waveforms shown below: 10M



(P.T.O..)

OR

12. B). Find the impedances, the total current and power factor of the following circuits. 10M
i) Resistance R in series with inductance L.
ii) Resistance R in series with capacitance C.

13. A). Explain with a neat sketch the constructional details of a DC Generator. 10M

OR

13. B). Explain the classification of dc generators with neat circuit diagrams. List few applications. 10M

14. A). Derive an EMF Equation of a Single-Phase Transformer. 10M

OR

14. B). Derive the condition for maximum efficiency of a single-phase transformer. 10M

15. A). Explain the Operating Principle of a three-phase induction motor, with neat circuit diagram. 10M

OR

15. B). Explain the construction and working of an alternator. 10M

H.T No:

--	--	--	--	--	--	--	--	--	--

R18

Course Code: A30531



CMR COLLEGE OF ENGINEERING & TECHNOLOGY
(UGC AUTONOMOUS)

B.Tech III Semester Regular & Supplementary Examinations Feb/March-2023

Course Name: PYTHON PROGRAMMING

(Common for CE, EEE, ME, ECE, CSE, IT, CSC & CSM)

Date: 03.03.2023 AN

Time: 3 hours

Max.Marks: 70

(Note: Assume suitable data if necessary)

PART-A

Answer all TEN questions (Compulsory)

Each question carries TWO marks.

10x2=20M

1. Mention any two features of Python. 2 M
2. What is implicit conversion? Give an example. 2 M
3. Python strings are immutable. Justify. 2 M
4. Do Loop statements have else clause? When will it be executed? 2 M
5. How will you update list items? Give one example. 2 M
6. What is difference between list and tuple in python? 2 M
7. Explain what a constructor does. 2 M
8. How is the lifetime of an object determined? What happens to an object when it dies? 2 M
9. Explain what happens when a program receives a non-numeric string when a number is expected as input. 2 M
10. When would you make a data field read-only, and how would you do this? 2 M

PART-B

Answer the following. Each question carries TEN Marks.

5x10=50M

- 11.A). Write Python Program to reverse a number and also find the Sum of digits in the reversed number. Prompt the user for input. 10M

OR

11. B). Explain the basic data types available in Python with examples. 10M

12. A). Write a function to determine whether a given natural number is a perfect number. A natural number is said to be a perfect number if it is the sum of its divisors. 10M

OR

12. B). List the three types of conditional statements and explain them. 10M

13. A). Write a Python program to add 'ing' at the end of a given string (length should be at least 3). If the given string already ends with 'ing' then add 'ly'. instead. If the string length of the given string is less than 3, leave it unchanged. 10M

OR

13. B). Compare and contrast different functions and methods used in dictionaries and set. 10M

(P.T.O..)

14. A). i) Write a short notes on different built in attributes associated with a class. 5M
ii) With the help of examples explain the concept of class methods and static methods. 5M

OR

14. B). Write a program that uses datetime module within a class. Enter manufacturing date and expiry date of the product. The program must display the years, months, and days that are left for expiry. 10M

15. A). Write a line of code that adds a Float Field to a window, at position (1, 1) in the grid, with an initial value of 0.0, a width of 15, and a precision of 2. 10M

OR

15. B). Describe the Graphical user interface using the tkinter module and widgets. 10M
