



# **OMEGA PG COLLEGE MBA&MCA**

APPROVED BY AICTE, AFFILIATED TO OSMANIA UNIVERSITY, HYDERABAD  
(Sy.No:7, Edulabad(V), Ghatkesar(M), Medchal Dist-501301)

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PaperCode-PCC101

## **Course: DISCRETE MATHEMATICS**

### **Important Questions:**

#### **UNIT-1**

- (a). What do you mean by composition of functions? Let the functions from  $\mathbb{R} \rightarrow \mathbb{R}$  defined as  $f(x) = x + 3$ ,  $g(x) = x - 4$  and  $h(x) = 5x$ . Find  $f \circ (g \circ h)(x)$ ,  $(f \circ g) \circ h(x)$   
(b). Let  $f: \mathbb{Z} \rightarrow \mathbb{Z}$  defined as  $f(a) = a + 1$  for  $a$  belongs to  $\mathbb{Z}$ . Find whether  $f$  is bijection or not?
- Prove the following set of identities
  - $A - (B \cap C) = (A - B) \cup A - C$
  - $(A \cup B) \cap C = (A \cap C) \cup (B \cap C)$
- Define equivalence relation with the help of suitable example. Prove that the relation  $R: \mathbb{Z} \times \mathbb{Z} = \{(a, b) / (a-b) \bmod 3 = 0\}$  is an equivalence relation.
- Define Partial Order Relation. Prove that Every partial order relation need not be a total order relation with an example problem.
- State and Prove Cantor's Schroder-Bernstein theorem
- Using Principle of mathematical induction show that  $1+2+3+\dots+n = n(n+1)/2$  for all  $n$  belongs to  $\mathbb{N}$ .

#### **UNIT-2**

- Explain Principle of inclusion and exclusion with generalization theorem.
- Find the number of integers from 1 to 1000 inclusive and divisible by none of 5, 6 & 8.
- How many integers from 1 to  $10^6$  inclusive are neither perfect squares, perfect cubes, nor perfect fourth powers.
- Explain the Pigeon hole principle and its applications
  - Show that at least two people must have their birthday in the same month if 13 people are assembled in a room.
- Find the number of ways in which the letters of the word ARRANGEMENT can be arranged so that two R's and two A's do not occur together
  - How many different committees can be formed consisting of 4 men and 3 women out of 7 men and 5 women
- How many integral solutions are there of  $x_1 + x_2 + x_3 + x_4 = 20$ , if  $1 \leq x_1 \leq 6$ ,  $1 \leq x_2 \leq 7$ ,  $1 \leq x_3 \leq 8$ ,  $1 \leq x_4 \leq 9$ ?

#### **UNIT-3**

- Give truth tables for (i)  $\neg p$  (ii)  $p \vee \neg q$  (iii)  $\neg p \vee q$  (iv)  $p \rightarrow \neg q$  (v)  $p \leftrightarrow q$
- Write the converse inverse and contra positive definitions and give those for the following logical implications.
  - If  $x$  and  $y$  are numbers such that  $x = y$ , then  $x^2 = y^2$
  - If a quadrilateral is a square then it is a rectangle
- Prove that :  $(p \leftrightarrow q) \wedge (q \leftrightarrow r) \Rightarrow (p \leftrightarrow r)$  is a tautology.
  - Show that :  $\sim(p \rightarrow q) \Leftrightarrow p \wedge (\sim q)$ .

16. (a)  $[\sim r \rightarrow (p \rightarrow q)] \Leftrightarrow [(p \wedge \sim q) \rightarrow r]$  prove this logical equivalence without using truth table  
 (b) Show that  $r \wedge (p \vee q)$  is a valid conclusion from the premises  $p \vee q$ ,  $q \rightarrow r$ ,  $p \rightarrow m$  and  $\sim m$ .
17. (a) Prove that if  $n=ab$  where  $a$  &  $b$  are positive integers, then  $a \leq \sqrt{n}$  or  $b \leq \sqrt{n}$   
 (b) Explain necessity and sufficiency and give simultaneously necessity and sufficiency example.
18. (a) Show that  $R \rightarrow S$  can be derived from the premises  $P \rightarrow (Q \rightarrow S)$ ,  $\sim R \vee P$  and  $Q$   
 (b) Prove that if  $3n+2$  is odd then  $n$  is odd by proof technique contradiction method

#### **UNIT-4**

19. Define Algebraic structure, binary operation on a set, different types of algebraic structures.
20. Write briefly about Semi groups, Monoids and Groups; Define free and cyclic groups. Problems based on those.
21. Prove that  $(\mathbb{Z}, *)$  is an abelian group where  $\mathbb{Z}$  is the set of all integers and the Binary operation is defined as  $a*b=ab/2 \forall a, b \in \mathbb{Z}$
22. Define Ring, and give properties of Rings. Define homomorphism of a Ring.
23. State and prove Lagranges theorem.
24. Define homomorphism, kernel of a homomorphism, and prove the properties of a homomorphism

#### **UNIT-5**

25. Explain about Breadth first search and Depth first search with examples
26. State and prove Grinberg's theorem
27. Explain about Kruskal's and Prim's algorithm for finding minimal spanning tree
28. Explain about Isomorphic graphs with examples
29. Write briefly about Isomorphism, Eulerian and Hamiltonian and walks Graphs?
30. Write about Bi-Connected Component and Articulation Points?

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## **MCA I YEAR I SEM A.Y 2023-2024**

### **DATA STRUCTURE USING C**

#### **UNIT WISE IMPORTANT QUESTIONS**

##### **UNIT-1**

1. What is the general structure of C program and explain with example?
2. What are the steps involved in Creation and Running of a C program?
3. What is an Operator? Explain different types of Operators in C Program
4. Describe the different types of constants in C with example.
5. Explain about Looping Statements in C
6. Describe the structure of C Program and write a program to find number is Even or Odd.
7. Write a C program to demonstrate string operations.

##### **UNIT-2**

1. Discuss about call by value and call by reference in Functions.
2. What is String? Explain any five String handling Library functions with suitable example.
3. Give an account on Unions in C with suitable Example.
4. Write a short note on Preprocessor Directives in C.
5. Write in detail about different types of loop statements in C.
6. Define Function. What do you understand by Cal by Value and Cal by Reference? Explain with Example
7. What is pointer in C programming? What are its benefits?
8. What are the various Dynamic Memory Allocation functions used in C? Explain them with an example.
9. How to pass an entire structure as an argument of a function?
10. How pointers can be used in structures? Demonstrate them with an example.
11. Write a short note on Preprocessor Directives in C.
12. Explain unions in C language? Differentiate structures and unions.
13. What is self-referential structure/ Nested Structure? Explain through example.

##### **UNIT-3**

1. What is Queue? Explain Different Types of Queues with example.
2. Explain about different operations on Queue with neat diagram.
3. Describe the applications of Queue.
4. What is Linked List? Explain about different types of Linked List.
5. Write a C program to demonstrate the Array implementation of Stack.
6. What is an Array? Explain Two-Dimensional Array with a Multiplication of two Matrices.
7. What is an array? How to declare and initialize arrays? Explain with examples.

##### **UNIT-4**

1. Explain about Binary Tree Traversal Techniques.
2. What is Binary search? Explain the process of searching an element using Binary search.
3. Write a C program to create a Binary Search Tree with 8 nodes.
4. What is AVL Tree? Discuss various Application and Rotation of AVL tree with example.
5. Explain the sequential representation of Graph in memory. Explain DFS traversal algorithm.
6. **Problem on Tree i.e Traversal, Pre order, Post order & In order**
7. **Problem AVL Tree Rotations**

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## **UNIT-5**

1. Explain Merge Sort Algorithm with Example.
2. Explain the algorithm for selection sort and give a suitable example.
3. **Explain different types of Hashing.**
4. **Give an account on Collision Resolution Techniques.**
5. **Explain the algorithm for Bubble Sort .Write a C Program to demonstrate Bubble Sort.**
6. Explain Quick Sort with help of Suitable Program.
7. **Algorithm and on Liner Search & Insertion Search.**

**Note : Above questions are Guess Questions, which cover max of the unit, which may or may not come in the exam.**

\*\*\*\*\* ALL THE BEST \*\*\*\*\*

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Contact No: 9912988863

Paper Code – PCC 103

Course: Object Oriented Programmer Using Java

## **Java Questions**

1. What is Data type in java?
2. What are the difference between Java and C++?
3. What are the limitation in array?
4. Define class , Inheritance , packages ?
5. List some OOP'S principles?
6. Define is Exception in java?
7. Define the keywords used in Exception Handling Techniques?
8. Define some function in String Handling in java?
9. What are Byte stream and Character stream class in java?
10. Define Multithreading in java?
11. What is Collection in java?
12. List some Collection class and Interfaces in java?
13. Define set, list , queue interfaces in java?
14. Define Legacy classes and Interface in java?
15. What is Timmer class in java?
16. What is AWT?
17. Define Event Handling in java?
18. List some AWT Controls in java?
19. Define checkboxGroup , Buttons and TextField in java?
20. What is Event class in java?
21. What is Swing in java?
22. Define serialization in java?
23. List some Reading and writing files in java?
24. Define Object in java?
25. Why we do not use Multiple Inheritance , Operator overloading and not use of global variables?



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MCA I SEM IMPORTANT QUESTIONS

Sub Code: PCC104

Subjects: Computer Architecture

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## Unit-1

1. Define Data Representation and its data types?
2. Explain about Floating point Representation?
3. Discuss about Fixed point Representation?
4. Write about Bus interconnection and Bus Structure?

## Unit-II

1. Define Register Transfer Micro operations its types ?
2. Explain about Register Transfer language?
3. Discuss about Memory Transfer and its types?
4. Elaborate Instruction Codes and Computer Registers?
5. Explain instructions Cycles and Memory reference Instructions?

## Unit-III

1. Discuss about Instruction formats and its role?
2. Explain Address Sequencing?
3. Define Control Memory and its types?
4. Elaborate Address Modes?

## Unit-IV

1. Explain in detail Memory Hierarchy?
2. Discuss about Main memory?
3. Write about Virtual Memory?
4. Elaborate Cache Memory?

## Unit-V

1. Discuss about Peripheral Devices?
2. Explain Synchronous data Transfer?
3. Write in detail Asynchronous data Transfer?
4. Explain about Direct Memory Access?
5. Write about Serial Communication and data transfer and manipulation?

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Paper Code – PCC 105

Course: PROBABILITY & STATISTICS (P & S)

UNIT WISE MODEL QUESTIONS FOR MCA I SEMESTER

## UNIT – 1: VECTOR SPACES (1 THEORY & 1 PRACTICAL PROBLEM)

1. Define the terms:

i) Null space, ii) column space iii) linear Transformation, iv) Independent set.

2. **One compulsory Practical Problem on Vector spaces**

## UNIT-2: PROBABILITY & DISTRIBUTIONS (1 THEORY & 1 PRACTICAL PROBLEM)

ESSAY ANSWER TYPE (15 MARKS)

1. Define Probability. And explain about additive, multiplicative Baye's and conditional theorems of probability with examples.

2. What is Probability Distribution? Explain the application of Binomial Poisson's Distribution.

3. Briefly explain the properties and applications of normal distribution.

4. Define Probability Distribution. Write briefly about discrete and Continuous Distribution

5. **One compulsory Practical Problem on Probability and Baye's Theorem.**

6. **One Compulsory Practical Problem on Binomial, Poison and Normal Distribution.**

## UNIT-3: SAMPLING AND ESTIMATIONS

(1 THEORY & 1 OR 2 PRACTICAL PROBLEMS)

1. What is sampling. Briefly explain various techniques of sampling.

2. Standard error of estimate and State the properties of a good estimator

3. What is small sample test? Explain t-distribution along with its properties and applications

4. **One or Two Practical Problems on t- distribution – (Single Mean , Difference Mean, Paired – t- test)**

5. **One problem on Point and Interval Estimation-( Point estimation, sample size and C.I)**

#### **UNIT-4 LARGE SAMPLE TEST (1 THEORY & 1 OR 2 PRACTICAL PROBLEMS)**

1. What is Hypothesis? Explain the procedure of testing the hypothesis.
2. What do you understand by Type-I and Type-II errors?
3. What are one – tailed and two – tailed tests.

#### **4. One or Two Practical Problems on Z- Distribution – (Single Mean, Difference Mean , Single Proportion and Difference Proportion)**

#### **UNIT-5:CHI-SQUARE, ANALYSIS OF VARIANCE, CORRELATION & REGRESSION (1 THEORY & 1 OR 2 PRACTICAL PROBLEMS)**

#### **ESSAY ANSWER TYPE (15 MARKS)**

1. What is Correlation and Regression Analysis explain the different types of Regression. State its applications and limitations
2. What is ANOVA? What are its assumptions and applications?
3. What is Chi-Square? Explain its applications and assumptions
- 4 **One compulsory Practical problem on Karl Pearson's co-efficient of Correlation And Spearman's Rank Correlation**  
(OR)
- 5 **One compulsory Practical Problem on Regression Analysis**  
(OR)
- 6 **One or Two Practical Problem on F-Distribution- (One way classification, Two way Classification) & Chi-square Distribution- (Goodness of fit & Independent of Attributes)**

#### **Note**

Important questions provided are not guess paper. The questions cover whole syllabus which include important questions in essay questions. These questions can be expected or cannot be expected in the External Question paper.....

**\*\*\*\*\*ALL THE BEST\*\*\*\*\***

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**Paper Code – MGC106**

## **MANAGERIAL ECONOMICS AND ACCOUNTANCY IMPORTANT QUESTIONS**

### **UNIT 1**

1. What is Managerial Economics and discuss the managerial economic concepts
2. What is the nature and scope of managerial economics?

### **UNIT 2**

1. Explain the concept of demand and what are the exceptions to law of demand
2. Define Elasticity of demand and explain the degrees of elasticity of demand
3. What are the demand forecasting methods?

### **UNIT 3**

1. Explain the Law of Variable Proportion
2. What is Break-Even Analysis?
3. What is perfect competition and how is Price-Output determination under Perfect Competition
4. What are the types of Economics of Scale and Cost of Production?

(problems on BEP can be asked)

### **UNIT 4**

1. Explain the process of capital budgeting and capital budgeting methods
2. What is working capital and how is it estimated

(problems on evaluation of capital budgeting opportunities can be asked)

### **UNIT 5**

1. What is accounting and explain the principles of accounting
2. Explain the various books of accounts
3. What is the difference between single entry and double entry system?

(problems on preparation of final accounts)