

Code No: D-0712/CDE

FACULTY OF INFORMATICS
M.C.A (CDE) I – Semester (Main) Examination, October / November 2022

Subject: Data Structures using C

Time: 3 Hours

Max. Marks: 70

Note: I. Answer one question from each unit. All questions carry equal marks.

II. Missing data, if any, may be suitably assumed.

Unit – I

1. (a) Explain the compilation and linking process in C?
(b) How do you define a constant?

(OR)

2. (a) Explain literals in C.
(b) Explain Tokens in C.

Unit – II

3. (a) List out various types of functions supported by C?
(b) What is recursion function?

(OR)

4. (a) Explain Pass by value and Pass by Reference.
(b) List out various C Library functions?

Unit – III

5. (a) What is data structure ? What are the types of data structures?
(b) How memory allocation is done in arrays?

(OR)

6. (a) Explain in detail Circular Linked List?
(b) Explain Linked list implementation of stack?

Unit – IV

7. (a) Explain various types of tree traversals in C?
(b) What is binary search tree? Explain advantages of binary search tree?

(OR)

8. (a) Define Graph ? Explain briefly about graph terminology?
(b) Explain Breadth First search algorithm?

Unit – V

9. (a) Write an algorithm to implement Merge sort?
(b) Differentiate between Quick sort and Merge Sort?

(OR)

10. (a) What is hashing? Why we need hashing?
(b) What is collision? Explain various collision resolution techniques?

D-0718/CDE
(4)

FACULTY OF INFORMATICS
M.C.A. (CDE) I- Semester, (Main) Examination, October/ November 2022

Code No.D-0716/CDE

Subject: Managerial Economics & Accountancy

Time: 3 Hours

Max. Marks: 70

**Note: I. Answer one question from each unit. All questions carry equal marks.
II. Missing data, if any, may be suitably assumed.**

Unit – I

1. a) Explain the nature and scope of Managerial Economics.
b) Evaluate the usefulness of Managerial economics to Engineers.
(OR)
2. Discuss how fundamental concept plays an important role in economic theory?

Unit – II

3. Explain the law of Demand with suitable examples.
(OR)
4. Elaborate various types of Income elasticity of demand and also its significance.

Unit – III

5. Describe the Iso-Quant production function and also expansion path.
(OR)
6. Discuss in detail characteristics that are essential for the existence of Perfect Competition and explain how price and output determined in the long-run.

Unit – IV

7. a) Explain the significance of working capital management and capital budgeting.
b) What are the steps of NPV and IRR method of capital budgeting.
(OR)
8. a) Explain the different traditional methods with few examples.
b) Explain the merits and demerits of ARR method.

Unit – V

9. a) Explain the advantages of double-entry book keeping.
b) Explain about the various types of subsidiary books along with examples.
(OR)
10. a) From the following balances taken from the books of Jinni and Granni Ltd. for the year ending March 31, 2021, calculate the gross profit.

	(₹)
Closing Stock	2,50,000
Net sales during the year	40,00,000
Net purchases during the year	15,00,000
Opening stock	15,00,000
Direct expenses	80,000

- b) Write notes on (1) Trial balance (2) Contra-entry situations.

Code No. D-0714/CDE

FACULTY OF INFORMATICS

M.C.A. (CDE) I- Semester, (Main) Examination, October/ November 2022

Subject: Computer Architecture

Time: 3 Hours

Max. Marks: 70

Note: I. Answer one question from each unit. All questions carry equal marks.

II. Missing data, if any, may be suitably assumed.

Unit – I

1. a) Using 2's complements, subtract the binary numbers 1010100-1000011.
b) Elaborate the bus interconnection. (OR)
2. a) Represent the decimal number +6132.789 using fraction and exponent form.
b) Explain about the bus structures.

Unit – II

3. a) Construct bus system for four registers using multiplexers.
b) Illustrate direct and indirect address with its demonstration. (OR)
4. a) Elaborate 4-bit binary adder-subtractor with its logic diagram.
b) Explain how the basic computer registers are connected to a common bus system.

Unit – III

5. a) Explain the flow chart for selection of control memory address.
b) Describe the block diagram of general register organization. (OR)
6. a) Elaborate the microinstruction format.
b) Give an overview of subroutine call and return.

Unit – IV

7. a) Discuss the block diagram and function table of a typical RAM chip.
b) Explain the memory table for mapping a virtual address. (OR)
8. a) Elaborate the two way associative mapping cache.
b) Explain the logical to physical address mapping in segmented page memory management unit.

Unit – V

9. a) Explain the connection of I/O bus to input-output devices.
b) Describe the source-initiated strobe for data transfer. (OR)
10. a) Compare isolated versus memory-mapped I/O.
b) Discuss the block diagram of DMA.

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Code No.D-0715/CDE

FACULTY OF INFORMATICS

M.C.A. (CDE) I - Semester (Main) Examination, October/ November 2022

Subject: Probability and statistics

Max. Marks: 70

Time: 3 Hours

Note: I. Answer one question from each unit. All questions carry equal marks.

II. Missing data, if any, may be suitably assumed.

Unit – I

1. a) What is vector subspace?

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b) Let w be the set of all vectors of the form $\begin{bmatrix} 2b + 3c \\ -b \\ 2c \end{bmatrix}$ where b & c are arbitrary.

Find vector u & V such that $w = \text{span}(u, v)$. Does w is a subspace of R^3 .

[10]

(OR)

2. a) Define kernel and range of a linear transformation.
b) Find bases for the null spaces of the matrix.

[4]

[10]

$$\begin{bmatrix} 1 & 0 & -3 & 2 \\ 0 & 1 & -5 & 4 \\ 3 & -2 & 1 & -2 \end{bmatrix}$$

Unit – II

3. a) Define exhaustive event, Impossible events,.

[3]

[11]

b) In a single throw of 2 dice, Find

- (i) Probability of odd number on the first dice and 6 on the second.
- (ii) Probability of a number greater than 4 on each dice.
- (iii) Probability of total 11.
- (iv) Probability of a total 9 or 11.

(OR)

[3]

[11]

4. a) What is Poisson distribution?

b) Obtain moment generating function and mean, variance of Poisson distribution.

Unit – III

5. a) Define Non random sampling.

[4]

b) What are the advantages of random sampling and explain the concept of standard errors?

[10]

(OR)

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FACULTY OF INFORMATICS
M.C.A (CDE) I – Semester (Main) Examination, October/ November 2022
Subject: Mathematical Foundation of Computer Science

Time: 3 Hours

Max. Marks: 70

Note: I. Answer one question from each unit. All questions carry equal marks.
II. Missing data, if any, may be suitably assumed.

Unit – I

1. (a) Show that $p \rightarrow (q \rightarrow p) \Leftrightarrow \sim p \rightarrow (p \rightarrow q)$
 (b) $(p \rightarrow q) \wedge (r \rightarrow q) \Leftrightarrow (p \vee r) \rightarrow q$ (OR)
2. (a) If $A = \{1, 2, 3\}$ $B = \{2, 3, 4\}$ $C = \{1, 3, 4\}$ then find (i) $A - (B \cap C)$ (ii) $A - (B - C)$
 (b) Prove that $B - \bar{A} = B \cap A$

Unit – II

3. (a) State and explain pigeonhole principle.
 (b) If 4 men and 7 women form a queue show that at least 3 men will be next to each other. (OR)
4. (a) State and prove principle of Inclusion exclusion with 3-sets?
 (b) How many derangements are there for 1, 2, 3, 4, 5?

Unit – III

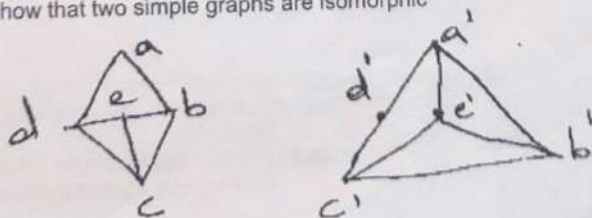
5. (a) Show that the generating function for the sequence $0^2, 1^2, 2^2, 3^2 \dots$ is $\frac{x+1}{(1-x)^3}$
 (b) Explain summation operator. (OR)
6. (a) Explain second – order linear homogenous recurrence relation.
 (b) Solve $a_n - 4a_{n-1} - 4a_{n-2} = (n+1)^2$ given $a_n = 0$; $a_1 = 1$

Unit – IV

7. (a) Define Abelian group with an example.
 (b) If $(G, *)$ is a group and $(a, b) \in G$, then show that $(a * b)^{-1} = b^{-1} * a^{-1}$ (OR)
8. State and prove Lag ranges theorem.

Unit – V

9. (a) Show that two simple graphs are isomorphic



- (b) Define (a) Bipartite Graph (b) Spanning Tree (OR)

10. (a) Explain BFS with example?
 (b) State and explain four colour problem for planar graphs?