

(6 pages)

Reg. No. : .....

Code No. : 7055

Sub. Code : ZCAM 11

M.C.A(CBCS) DEGREE EXAMINATION,  
NOVEMBER 2022.

First Semester

Computer Applications – Core

MATHEMATICAL FOUNDATION FOR  
COMPUTER SCIENCE

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. Find the Eigen values for the following 2×2 matrix.?

$$A = \begin{bmatrix} 1 & 8 \\ 2 & 1 \end{bmatrix}$$

- (a) -3                      (b) 2  
(c) 6                        (d) 4

2. The Eigen value is \_\_\_\_\_  
(a) A vector obtained from the coordinates  
(b) A matrix determined from the algebraic equations  
(c) A scalar associated with a given linear transformation  
(d) It is the inverse of the transform
3.  $p \vee q$  is logically equivalent to \_\_\_\_\_  
(a)  $\neg q \rightarrow \neg p$                       (b)  $q \rightarrow p$   
(c)  $\neg p \rightarrow \neg q$                       (d)  $\neg p \rightarrow q$
4. A predicate is a proposition containing \_\_\_\_\_, which is what's dealt with in predicate logic?  
(a) Statics                      (b) Variables  
(c) Numbers                      (d) Logic
5. A relation can be represented using a?  
(a) In directed graph                      (b) Pie graph  
(c) Directed graph                      (d) Line graph
6. The \_\_\_\_\_ Relation between sets X and Y is the set  $X \times Y$ .  
(a) Empty                      (b) Full  
(c) Identity                      (d) Inverse



7. A variable (Random Variable) assuming an infinite number of values is called
- Continuous Random Variable
  - Discrete Random Variable
  - Absolute Variable
  - Data
8. Normal Distribution is applied for \_\_\_\_\_
- Continuous Random Distribution
  - Discrete Random Variable
  - Irregular Random Variable
  - Uncertain Random Variable
9. A spanning tree with the smallest weight in a weighted graph is known as
- Shortest spanning graph
  - Shortest spanning tree
  - Simple spanning tree
  - Weighted tree
10. Which one of the following is not a matrix representation in graph?
- Adjacency Matrix
  - Circuit Matrix
  - Incidence Matrix
  - Data Matrix

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Draw the Venn diagram for union and intersection operations.

Or

- (b) Elucidate the eigenvectors with example.

12. (a) Write short note on predicate logic.

Or

- (b) Describe about the rules of inference with example.

13. (a) Explain the discrete Random variable with example.

Or

- (b) Explain the properties of partial order relations.

14. (a) Explain the continuous probability distributions with example.

Or

- (b) Explain the binominal distribution with example.



15. (a) Explain the graph isomorphism with example.

Or

- (b) Describe about the planer graph with example.

PART C — ( $5 \times 8 = 40$  marks)

Answer ALL questions, choosing either (a) or (b).

16. (a) If  $A = \{10, 20, 33, 44\}$  and  $B = \{44, 55, 66, 77, 10, 20\}$ , then find the union, intersection and set difference of A and B.

Or

- (b) Illustrate the Eigen values with example.

17. (a) Construct the truth table for the given statements  $p \vee \neg(p \wedge q)$

Or

- (b) Show that  $\neg(p \rightarrow q)$  is equivalent to  $p \wedge \neg q$

18. (a) How will you represent the relations? Discuss it.

Or

- (b) Explain the equivalence relations with example.

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19. (a) Explain the following.

(i) Mean (ii) Variance (iii) Co-Variance

Or

- (b) Demonstrate the discrete probability distribution with example.

20. (a) Explain the types of graph with example.

Or

- (b) Discuss the following

(i) Graphy Isomorphism (ii) Connectivity  
(iii) Euler Graph

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