



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

InSem Examination-I Winter2025	
Exam Seat No.:	
Academic Year:2025-2026	Semester:I
Class:PG-I	Program:MCA
Branch Code:09.	Pattern:2024
Name of Course:Discrete Mathematics	Course Code:2409501
Max. Marks:30	Duration:1.15 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 02 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. The last columns indicates the Course Outcome and level of Blooms Taxonomy of the Question/sub-question.

Marks CO

Question No. 1

- 1 a) To describe the various restaurants in the city, let p denote the statement "the food is good", q the statement "the service is good" and r the statement "the rating is three-star". (7) CO1

Write the following statements in symbolic form :

- (i) Either the food is good or service is good, or both.
- (ii) Either the food is good or service is good, but not both.
- (iii)The food is good while the service is poor.
- (iv) It is not the case that both the food is good and the rating is three-star.
- (v)If both the food and service are good, then the rating is three-star.
- (vi)It is not true that a three-star rating always means good food and good service.

Question No. 2

- 2 a) Using Venn diagram ,prove or disprove: (8) CO1

- (i) $A \oplus (B \oplus C) = (A \oplus B) \oplus C$
- (ii) $(A - B) - C = A - (B \cup C)$

OR

- 2 b) Out of integers 1 to 1000 (8) CO1

- (i)How many are not divisible by 3, nor by 5, nor by 7?
- (ii)How many are not divisible by 5 and 7 but divisible by 3?

Question No. 3

- 3 a) Explain representation of relation? (7) CO2

Let $A = \{ a, b, c, d \}$ and $B = \{ 1, 2, 3, 4 \}$

Let $R = \{ (a, 1), (a, 3), (b, 4), (c, 1), (d, 2) \}$

Find the Relation matrix and the digraph.

Question No. 4

4 a) Explain properties of binary relations.

(8) CO2

OR

4 b) Find the transitive closure of R by Warshall's algorithm;

(8) CO2

where $A = \{ 1, 2, 3, 4, 5, 6 \}$ and $R = \{ (x, y) \mid |x - y| = 2 \}$

..... End of question paper.....