

	<p style="text-align: center;">MIDTERM EXAMINATION</p> <p style="text-align: center;">SUMMER 2007</p> <p style="text-align: center;">MTH202 - DISCRETE MATHEMATICS (Session - 1)</p>	<p style="text-align: center;">Marks: 40</p> <p style="text-align: center;">Time: 120min</p>
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Question No: 1 (Marks: 1) - Please choose one
<p>Negations for the given statement “The train is late or my watch is fast” is</p> <ul style="list-style-type: none"> ▶ The train is not late or my watch is not fast. ▶ The train is not late and my watch is not fast. ▶ The train is not late or my watch is fast. ▶ None of these.
Question No: 2 (Marks: 1) - Please choose one

Let R be the relation from $A = \{a_1, a_2, a_3\}$ (Elements of A are ordered by their subscript) to itself given

by the matrix representation $\begin{pmatrix} 0 & 1 & 0 \\ 1 & 0 & 1 \\ 0 & 1 & 0 \end{pmatrix}$. Then R is

- ▶ Reflexive and Symmetric.
- ▶ Symmetric and Transitive.
- ▶ Irreflexive and Symmetric.
- ▶ Irreflexive and Anti- Symmetric.

Question No: 3 (Marks: 1) - Please choose one

If out of 35 people each person like Discrete Mathematics or Data Structures ,25 like Discrete Mathematics, and 20 like Data structures then the number of people who like both Discrete and Data Structures is.....

- ▶ 5
- ▶ 15

▶ 10

▶ None of these.

Question No: 4 (Marks: 1) - Please choose one

Inverse of a function may not be a function

▶ True

▶ False

Question No: 5 (Marks: 1) - Please choose one

The process of defining an object in terms of smaller versions of itself is called recursion.

▶ True

► False.

Question No: 6 (Marks: 8)

Test the following argument for validity:

Logic is difficult or not many students like logic.

If Mathematics is easy, then logic is not difficult.

Therefore,

Mathematics is not easy or logic is difficult.

Question No: 7 (Marks: 9)

Let $A = \{a, b, c, d\}$ and define the null relation $\emptyset$ and universal relation $A \times A$ on A . Test these relations for reflexive, symmetric and transitive properties.

Question No: 8 (Marks: 4)

Let f and g be the functions from the set of integers to the set of integers defined by $f(x) = 2x + 3$ and $g(x) = 3x + 2$. What is the composition of f and g ? What is the composition of g and f ?

Question No: 9 (Marks: 9)

If the 5th element of an arithmetic sequence is -16 and the 20th term is -46.

Then find 10th term.

(Note: Use the proper formula of sequence)

Question No: 10 (Marks: 5)

Show that the sequence $0, 1, 3, 7, \dots, 2^n - 1, \dots$, for $n \geq 0$, satisfies the recurrence relation

$$C_k = 2C_{k-1} + 1,$$

for all integers $k \geq 0$

