

MTH202- Discrete Mathematics MIDTERM EXAMINATION**Time: 60 min****Marks: 40****Question No: 1 (Marks: 1) - Please choose one**

The negation of "Today is Friday" is

- Today is Saturday
- Today is not Friday **p_3**
- Today is Thursday

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Question No: 2 (Marks: 1) - Please choose one

An arrangement of rows and columns that specifies the truth value of a compound proposition for all possible truth values of its constituent propositions is called

- Truth Table **p_4**
- Venn diagram
- False Table
- None of these

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

For two sets A,B

 $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ is called

- Distributivity of intersection over union
- Distributivity of union over intersection
- Distributivity Law **p_44**
- None of these

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

An argument is _____ if the conclusion is true when all the premises are true.

- Valid **p_19**
- Invalid
- False
- None of these

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

The row in the truth table of an argument where all premises are true is called

- Valid row
- Invalid row
- Critical row **p_19**
- None of these

Question No: 6 (Marks: 1) - Please choose one

Check whether

$36 \equiv 1 \pmod{5}$

$33 \equiv 3 \pmod{10}$

$36 \text{ Modulus } 5 = 1 \text{ remainder}$

$33 \text{ Modulus } 10 = 3 \text{ remainder}$

- Both are equivalent
- Second one is equivalent but first one is not
- First one is equivalent but second one is not

Question No: 7 (Marks: 1) - Please choose one

A binary relation R is called Partial order relation if

- It is Reflexive and transitive
- It is symmetric and transitive
- It is reflexive, symmetric and transitive
- It is reflexive, antisymmetric and transitive

p_79

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Question No: 8 (Marks: 1) - Please choose one

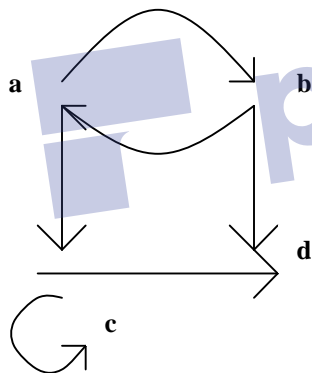
The order pairs which are not present in a relation, must be present in

- Inverse of that relation
- Composition of relations
- Complementary relation of that relation

p_84

Question No: 9 (Marks: 1) - Please choose one

The relation as a set of ordered pairs as shown in figure is



- $\{(a,b),(b,a),(b,d),(c,d)\}$
- $\{(a,b),(b,a),(a,c),(b,a),(c,c),(c,d)\}$
- $\{(a,b), (a,c), (b,a),(b,d), (c,c),(c,d)\}$
- $\{(a,b), (a,c), (b,a),(b,d),(c,d)\}$

p_63

Question No: 10 (Marks: 1) - Please choose one

A circuit with two input signals and one output signal is called

- NOT-gate (or inverter)
- AND-gate
- None of these

p_22

Question No: 11 (Marks: 1) - Please choose one

If $f(x)=2x+1$ then its inverse =

- $x-1$
- $\frac{1}{2}(x-1)$ **not sure** **p_112**
- x^2+2

Question No: 12 (Marks: 1) - Please choose one

Null set is denoted by

- (ϕ) or $\{\}$. **P_30**
- A
- None of these

Question No: 13 (Marks: 1) - Please choose one

The total number of elements in a set is called

- Strength
- Cardinality
- Finite **p_31**

Question No: 14 (Marks: 1) - Please choose one

If $f(x)=x+1$ and $g(x)= -2x^2+1$ then $(2f - 1g)x=$

- $2x^2 - x$
- $3x+2$
- $2x^2 + 2x + 1$

$$2(x+1)-1(-2x^2+1)$$

$$2x+2+2x^2-1$$

$$2x^2+2x+1$$

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Question No: 15 (Marks: 1) - Please choose one

Let

$$a_0 = 1, a_1 = -2 \text{ and } a_2 = 3$$

$$\text{Then } \sum_{j=0}^2 a_j =$$

- -6
- **2**
- 8

Question No: 16 (Marks: 1) - Please choose one

Which of the given statement is incorrect?

- The process of defining an object in terms of smaller versions of itself is called recursion.
- A recursive definition has two parts: Base and Recursion.
- Functions cannot be defined recursively
- Sets can be defined recursively.

Question No: 17 (Marks: 1) - Please choose one

The operations of intersection and union on sets are commutative

- True p_44
- False
- Depends on the sets given

Question No: 18 (Marks: 1) - Please choose one

The power set of a set A is the set of all subsets of A, denoted P(A).

- False
- True p_58

Question No: 19 (Marks: 1) - Please choose one

What is the output state of an OR gate if the inputs are 0 and 1?

- 0
- 1 p_22
- 2
- 3

Question No: 20 (Marks: 1) - Please choose one

The product of the positive integers from 1 to n is called

- Multiplication
- n factorial
- Geometric sequence

Question No: 21 (Marks: 2)

Let

R be the relation on from A to B as

$$R = \{(1,y), (2,x), (2,y), (3,x)\}$$

Find

- (a) domain of R
- (b) range of R

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Question No: 22 (Marks: 2)

Missing

Question No: 23 (Marks: 3)

Suppose that R and S are reflexive relations on a set A. Prove or disprove $R \cap S$ is reflexive.

Question No: 24 (Marks: 3)

Find the sum of the infinite G.P.

$$2, \sqrt{2}, 1, \dots$$

Question No: 25 (Marks: 5)

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$$f(x) = \frac{x}{2} + 3 \text{ and } g(x) = \frac{3}{4}x - 2$$

then find the value of

$$5f(-2) - 7g(-4)$$

Question No: 26 (Marks: 5)

Write the geometric sequence with positive terms whose second term is 9 and fourth term is 1.

 pdfelement

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