End Semester Examination (Discrete Mathematics (MA221))

*Required

Instructions:

Responses are limited to only one
 (i) Attempt all questions
(ii) Total marks 20
(iii) There will be no negative marking
(iv) Follow usual notations

The chromatic number of a complete graph having n vertices is *   1 point

○ n-1

○ 2n

○ n/2

◉ n

*

1 point

$p \leftrightarrow q$ is logically equivalent to

$$(p \rightarrow q) \rightarrow (q \rightarrow p)$$

○ Option 1

$$(p \rightarrow q) \vee (q \rightarrow p)$$

○ Option 2

$$(p \rightarrow q) \wedge (q \rightarrow p)$$

◉ Option 3

$$(p \wedge q) \rightarrow (q \wedge p)$$

○ Option 4

What is order of a group? State Lagrange's theorem for finite groups. *

2 points

The order of a group is its cardinality, i.e. the r

Let A , B be non empty sets f : A → B be a permutation. Then___ *   1 point

☐ f is bijective and A ≠ B

☑ f is bijective and A = B

☐ f is one one and A ≠ B

☐ f is onto and A ≠ B

Define cnf and dnf of statement variables. *   2 points

CNF : A formula which consists of a product o

Define equivalence relations and Poset. *   2 points

A RELATION IS SAID TO BE EQUIVALENCE REL

Define abelian group. Why every subgroup of an abelian group is normal. *   2 points

A group that follows commutative law is know

A K3,3 graph is _____ graph. *   1 point

- ☐ planar
- ☑ complete
- ☑ regular
- ☑ non-planar
- ☑ bipertite

*   1 point

Let, $P(x)$ denote the statement "$x = x + 7$". What is the truth value of the quantification $\exists\, xP(x)$, where the domain consists of all real numbers?

- ○ True
- ⦿ False
- ○ It can be true
- ○ None

In a capacited flow network if f(e) and c(e) are flow along edge e and capacity of edge respectively then *   1 point

- ☐ 0≥f(e), c(e)
- ☑ c(e) ≥ f(e)
- ☐ f(e)≥c(e)
- ☑ f(e), c(e)≥0

A self-complemented distributive lattice is called *   1 point

○ Complete lattice

○ Self dual lattice

○ Modular lattice

◉ Boolean algebra

What is simple graph? Explain why no simple graph can have degree   2 points
sequence (6, 4, 3, 3, 2, 2). *

A GRAPH WITH NO LOOPS AND PARALLEL ED

Which of the following does not hold for operations on sets? *   1 point

☑ X-Y=Y-X

☐ (X ∪ Y)∩X=X

☐ (X ∩ Y)'=X'∪Y'

☐ (X ∪ Y)∩Z=(X ∩Z)∪(Y∩Z)

☐ (X ∩ Y)∪Z=(X ∪Z)∩(Y∪Z)

☑ (X ∪ Y)∩X=Y

Suppose repetitions are not permitted. (1)How many three-digit numbers   2 points
can be formed from the six-digits 2,3,5,6,7 and 9? (2) How many of these
numbers are less than 400? *

(1) 6*5*4 = 120 and (2) 2*5*4 = 40

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