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BCA. Examination 2018-2019

(Even Semester)

MATHEMATICS II

Time : Three Hours] *[Maximum Marks : 60*

Note :– Attempt all questions.

SECTION – A

1. Attempt all parts of the following : $8 \times 1 = 8$

(a) Write the set A = { 1, 2, 3, 4, 5, 6, 7, 8 } in the set-builder form.

(b) If A = {1, 2, 3} find P(A)

(c) If a set A has m elements how many ralations are there from A to A.

(d) If the function $f : R \to R$ defined by $f(x) = x^2$, find f^1 (4).

(e) Draw the Hasse diagram for the set of factors of 17 for relation divides.

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(f) Define poset.

(g) Find the generator of the cyclic group G= {1, 2, 3, 4, 5, 6. } x_7.

(h) Define integral domain.

SECTION – B

2. Attempt any two parts of the following : $2 \times 6 = 12$

(a) If A, B and C are sets then prove that

$$A \times (B \cap C) = (A \times B) \cap (A \times C)$$

(b) Prove that the intersection of two equivalence relations on a set is an equivalence relation on the set.

(c) Prove that every finite lattice is bounded.

(d) Show that the set G = {1, -1, i, -i }Consisting of four fourth roots of unity form an Abelian multiplicative group.

SECTION – C

Note :– Attempt all questions.

3. Attempt any two parts : $2 \times 5 = 10$

(a) Define following with example:

(i) Union and intersection of sets

(ii) Disjoint and intersecting sets

(b) For any sets A and B prove that :

$$P(A \cap B) = P(A) \cap P(B)$$

(c) In a group of 65 people 40 like cricket, 10 like cricket and tennis both. How many like tennis only and not cricket? How many like tennis?

4. Attempt any two parts : $2 \times 5 = 10$

(a) Define relation and explain types of relation.

(b) net X = { 1, 2, 3, 4, 5, 6, 7 } and R = { (x, y) : x - y is divisible by 3 } Show that R is an equivalence relation.

(c) Show that the function f and g both of which are form N × N to N given by f(x, y) = x + y and g(x, y) = x y are onto but not one one.

5. Attempt any two parts : $2 \times 5 = 10$

(a) Let S = { 1, 2, 3 } and A = P(S). Draw the Hasse diagram of the poset A with the partial order $\subseteq$ (set inclusion).

(b) Define bounded lattice and prove that every finite lattice is bounded.

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(c) If (L, ^, V) is complemented distributive lattice then the complement of $a \in L$ is unique.

6. Attempt any two parts : $2 \times 5 = 10$

(a) The necessary and sufficient condition for a non empty subset H of a group (G, 0) to be a subqroup is :

$$a \in H,\ b \in H \Rightarrow aob^{-1} \in H$$

Where b-1 is the inverse of b in G.

(b) Define normal subgroup homomorphism isomotrphism.

(c) Prove that every field is an integral domain.

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