B.M.S COLLEGE FOR WOMEN AUTONOMOUS
BENGALURU – 560004

END SEMESTER EXAMINATION – SEPTEMBER / OCTOBER 2022

Open Elective - II Semester
Commercial Mathematics

Course Code: MAT2OE02   **QP Code:2203**
Duration: 2 ½ Hours   **Max Marks: 60**

I. Answer any Six Questions: (6x2=12)

1. Write the following in Roaster form $A = \{x: x \text{ is a multiple of } 5, \; x < 40, \; x \epsilon N\}$.
2. If $A = \{2,3,5\}$ and $B = \{1,4\}$ find the cartesian product of $A \times B$.
3. State Commutative law on Binary operations.
4. In how many ways can 4 students be seated on a bench among themselves.
5. If P(A)=10, P(B)=7 , P(A∪B)=6 find P(A∩B).
6. Define the difference between permutation and combination.
7. Find the ratio between 12kg and 18kg.
8. Find x, if 25% of x=50.

II. Answer any six questions: (6x8=48)

1. a.) In a group of 380 people, 170 likes coffee, 230 likes tea, and each person like at least one of the two kinds. Find how many people like both coffee and tea. Represent with a Venn diagram.
   b.) If = {1,3,4} , $B = \{5,7,9\}$ and $C = \{1,3,5\}$ find $A \Delta B \; and \; (A \cup B) \cap C$.

   (5+3)

2. a.) Show that the relation R "is parallel to" is an equivalence relation on the set of parallel lines.
   b.) Let f: R → R given by $(x) = 2x + 5$, then show that f is bijective.

   (5+3)

3. If $U = \{0, 1, 2, 3, 4, 5, 6, 7, 8, 9\}$ is the universal set, $A = \{2, 3, 4, 8\}$, $B = \{1, 3, 4\}$
   And $C = \{3, 4, 5\; 6\}$ verify that
   i) (A∩B)^1 = A^1∪B^1
   ii) $A − (B \cup C) = (A – B) \cup (A – C)$

   (8)

4. a.) In how many ways the letters of the word " ARRANGE" be arranged.
      i) When Two R's come together.
      ii) When two R's do not come together.

   b.) On the set of rationals , * is defined by $a * b = \frac{ab}{5}$ ∀ a,b∈Q , Prove that * is an associative.

   (5+3)

5.a)A coin is tossed three times, find the probability that at the most two heads appear.

   b) Find the value of $\dfrac{12!}{4! X 3!}$.

   (5+3)

6. a)Prove that $^{n}C_r + {}^{n}C_{r-1} = {}^{n+1}C_r$.

   b)find value of P(10,8)

   (5+3)

7. a) Divide Rs.5880 in the ratio 3:6:5 among A, B and C.

   b) Raju has monthly salary of Rs.24000. She spends Rs.15000 on rent and Rs.3000 on food. What percentage of her salary does she save?

   (5+3)

8.a) 16 men or 28 women can do a work in 40 days. In how many days will 24 men and 14 women complete the same work?

   b) A shopkeeper bought an article for Rs.1600 and sold it at a loss of Rs.192. Find the Loss percentage.

   (5+3)

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