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B.M.S COLLEGE FOR WOMEN AUTONOMOUS

BENGALURU – 560004

SEMESTER END EXAMINATION – SEPTEMBER- 2023

Open Elective - II Semester

COMMERCIAL MATHEMATICS

(NEP Scheme 2021-22 Onwards)

Course Code: MAT2OE02

Duration: 2 ½ Hours

QP Code: 2202

Max marks: 60

Instructions: Answer all the sections.

SECTION-A

I. Answer any Six Questions:

(6X2=12)

1. Write the following in set builder form $A = \{2,4,6,8\}$.
2. Define a set. Give an example.
3. On the set of naturals N , $a * b = 4a - 3b$, $\forall a, b \in N$. Show that $*$ is not a binary operation.
4. Find the value of $P(6,2)$
5. Define mutually exhaustive events.
6. Find r if ${}^{15}C_{r+3} = {}^{15}C_{2r-3}$.
7. Find the Duplicate ratio and sub-duplicate ratio of 1:4.
8. Find 20% of 500.

SECTION-B

II. Answer any Six Questions:

(6X8=48)

1. a) In a group 40 people, each person like at least one of the two kinds, 30 people like coffee and 10 people like both coffee and tea. Find how many like tea. Represent with a Venn diagram.
b) If $A = \{2,3,4\}$ and $B = \{4,5,6\}$ find the Cartesian product of $A \times B$ and symmetric difference $A \Delta B$.
2. a) Show that the relation R "is congruent to" is an equivalence relation on the set of triangles.
b) Let $f: R \rightarrow R$ is defined by $f(x) = 5x - 7$. Prove that f is bijective.
3. $A = \{1,3,5,6,7\}$, $B = \{1,2,4,6,7\}$ and $C = \{1,3,5,7\}$ verify the following and verify with Venn diagram. $A \cup (B \cap C) = (A \cup B) \cap C$
4. a) In how many ways the letters of the word 'MISSISSIPPI' can be arranged. Also find the arrangements if vowels come together.

- b) On the set of integers Z , $*$ is defined by $a * b = a + b - 7$. Find the identity element.
5. a) A card is drawn from a well shuffled pack of playing cards. Find the probability that it is either a diamond or a king.
b) Find the value of $\frac{12!}{2! \times 3! \times 4!}$
6. From 8 gentlemen & 4 ladies a committee of 5 is to be formed. In how many ways can this be done so as to include at least 1 lady.
7. a) The ratio of two numbers is 2:3 and their sum is 85. Find the numbers.
b) In a class of 300 students 93 students are girls. Find the Percentage of boys and Percentage of girls?
8. a) A man bought a fan for Rs.1000 and sold it a loss of 15%. What is the selling price of the fan?
b) Use the Cross-product property to determine if the ratios $\frac{3}{6}$ and $\frac{5}{10}$ are proportional.
