

Seat No. : _____

MM-104

July-2021

B.B.A., Sem.-I

CC-107 : Business Maths

Time : 2 Hours]

[Max. Marks : 50

- Instructions :** (1) All Questions in **Section I** carry equal marks.
(2) Attempt any **TWO** questions in **Section I**.
(3) Question **V** in **Section II** is **COMPULSORY**.

Section – I

1. (A) If $A = \{1, 3, 5, 7, 9\}$, $B = \{3, 4, 5, 7\}$ and $C = \{1, 4, 5, 6, 7\}$ then prove that
- (i) $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$
- (ii) $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$ 10
- (B) If $A = \{1, 3, 4\}$, $B = \{2, 3\}$ and $C = \{1, 2, 5\}$ then prove that
- (i) $A \times (B \cup C) = (A \times B) \cup (A \times C)$
- (ii) $A \times (B \cap C) = (A \times B) \cap (A \times C)$ 10
2. (A) A Pen manufacturer finds that the production cost of each pen is ₹ 30 and the fixed cost is ₹ 15,000. If each pen can be sold for ₹ 45, then determine its Cost Function, Revenue function and The break-even point. Also find profit if 2000 pens manufactures and sold. 10
- (B) Evaluate limits. (any **four**) 10
- (i) $\lim_{x \rightarrow 3} \frac{\sqrt{x+2} - \sqrt{5}}{x-3}$
- (ii) $\lim_{x \rightarrow 0} \frac{3^{2x} - 2^{3x}}{x}$
- (iii) $\lim_{x \rightarrow 1} \frac{x^2 + x - 2}{x^2 + 2x - 3}$
- (iv) $\lim_{x \rightarrow \infty} \frac{\sqrt{5x^4 - 4x^3 + 2x + 4}}{(2x+1)(5x-3)}$
- (v) $\lim_{x \rightarrow -2} \frac{x^2 + 9x + 14}{2x^2 + 5x + 2}$
- (vi) $\lim_{x \rightarrow -1} \left\{ 1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{x}}} \right\}$

3. (A) A bag contains 5 red, 3 green and 2 white balls. In how many ways 3 balls can be drawn from it such that (i) one ball of each colour is included. (ii) 2 balls of the same colour and 1 ball of different colour are included. (iii) 3 balls of the same colour are included. **10**
- (B) How many five digit numbers can be formed greater than 50000 with digits 3, 4, 5, 6, 7, 8 so that are digit is used not more than once ? How many of them are even ? **10**
4. (A) Obtain the equation of line passing through intersection point of lines $3x - y - 5 = 0$ and $x + 5y - 7 = 0$ and parallel to line $4x + 5y + 11 = 0$. **10**
- (B) The sum of four terms in A.P. is 40 and the sum of their squares is 420. Find the numbers. **10**

Section – II

5. Do as directed. (any **10**) **10**
- (i) Let A and B be sets. What does it mean if we say that x is an element of (A union B) ?
- (a) x is an element of A and is also an element of B.
 (b) x is an element of A, or is an element of B, or both.
 (c) x is an element of B.
 (d) A is equal to B, and x is an element of both.
- (ii) If $f(x) = ax + b$, where $a, b \in \mathbb{R}$, $a \neq 0$, then f is called a
- (a) Constant function (b) Linear function
 (c) Quadratic function (d) Polynomial function
- (iii) If $f(x) = 5x + 3$ then f is
- (a) One-one function (b) Many-one function
 (c) Constant function (d) None
- (iv) If numbers a, b, c, d, e form an A.P., then the value of $a - 4b + 6c - 4d + e$ is
- (a) 1 (b) 2
 (c) 0 (d) None of these

- (v) The sum of the first ten terms of an AP is four times the sum of the first five terms, then the ratio of the first term to the common difference is
- (a) $1/2$ (b) 2
(c) $1/4$ (d) 4
- (vi) What is the value of 'k' if $3kx + 5y + k = 0$ passes through the point $(-1, 4)$?
- (a) $5/3$ (b) $-3/5$
(c) 10 (d) None of these
- (vii) If ${}^{18}C_n = {}^{18}C_{n+2}$ then the value of n is _____
- (a) 0 (b) -2
(c) 8 (d) None of these
- (viii) If $A = \{1, 2\}$ and $B = \{3, 4\}$, then $A \times B =$ _____
- (ix) If lines $3x - ky + 8 = 0$ and $5x + 2y - 9 = 0$ are parallel, find 'k'.
- (x) Find $4 + 12 + 36 + 108 + \dots \dots \dots$ 10 terms.
- (xi) $\lim_{x \rightarrow 0} \frac{a^x - 1}{x} =$ _____.
- (xii) If $f(x) = 5x^2 + 7x + 2$, find the value of x when $f(x) = 110$.
- (xiii) Find if ${}_{x+2}^{19}C = {}_{2x-1}^{19}C$.
- (xiv) Find the number of permutation that can be formed from all the letter in the word ATLANTA.
- (xv) What is slope value in equation $2x + 3y + 5 = 0$.
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