

**DF-105**

December-2018

B.B.A., Sem.-I

**CC-107 : Basics of Mathematics****Time : 2:30 Hours]****[Max. Marks : 70**1. (A) (1) Define the following terms : (any **three**)

- (i) Power set
- (ii) Union of two events
- (iii) Singleton set
- (iv) Universal set

(2) In survey of 2000 persons it was found that 540 read magazines A, 600 read magazine B, 840 magazines C, 160 read magazines A and B, 200 read magazine A and C, 100 read magazine B and C and 60 read all three magazines, find

- (i) How many read at least one of these magazines ?
- (ii) How many read none of three magazines ?
- (iii) How many read magazine A and B but not C ?

**OR**(1)  $A = (1, 3)$ ,  $B = (4, 6)$  and  $C = (5, 9)$  then prove that

- (i)  $(A \times B) \cap (A \times C) = A \times (B \cap C)$
- (ii)  $(A \times B) \cup (A \times C) = A \times (B \cup C)$

(2)  $A = \{f, e, d, c, b, a\}$ ,  $B = \{x/x \text{ is vowel}\}$ ,  $C = \{u, t, s, r, q, p, o, n, m\}$ , then find  $(A \cup C)$ ,  $(B \cap C)$ ,  $(A \cup B \cup C)$

(B) Write down any **four** answers of the following :

- (1) If  $A = \{1, 2, 3\}$ , give the power set of A.
- (2) Give example of Equal sets.
- (3) Every set is a subset of itself, this sentence is true/false.
- (4) This statement is true/false.  $A \cap A' = \phi$ .
- (5) How many methods in sets theory ?
- (6) Explain example of Cartesian product.

2. (A) (1) Define the following terms : (any **three**)

7

- (i) Domain of function
- (ii) One-One function
- (iii)  $X \rightarrow 2$
- (iv) Function

(2) Solve any **three** :

(1)  $\lim_{x \rightarrow 3} \frac{x^3 - 27}{\sqrt{x} - \sqrt{3}}$

(2)  $\lim_{x \rightarrow \infty} \frac{1 - \sqrt{x}}{1 + \sqrt{x}}$

(3)  $\lim_{x \rightarrow 0} \frac{a^{5x} + a^{2x} - 2}{x}$

(4)  $\lim_{x \rightarrow \infty} \left(1 + \frac{9}{x}\right)^x$

(5)  $\lim_{x \rightarrow -1} \frac{x^2 - x - 2}{2x^2 - x - 3}$

**OR**

(1) For product A production the following information is available. Variable cost per unit ₹ 100, fixed cost ₹ 20,000, selling price ₹ 200 per unit. Find out the following :

7

- (i) Break Even Point
- (ii) Profit Function
- (iii) If 250 unit produce then find out profit Loss.

(2) Give the meaning of Limit of a Function. Also state the rules of Limit.

7

(B) Write down any **four** answers of the following :

4

(1) Evaluate  $\lim_{x \rightarrow 0} 2 + \frac{2}{3 + \frac{4}{x}}$

(2) Explain Equal function.

(3)  $X \rightarrow 0$

(4) Give Example of Many one function.

(5)  $\lim_{x \rightarrow 5} \frac{x^3 - 125}{x - 5}$

(6) Write down Linear Function.

3. (A) (1) Explain : 7  
 (i) Permutation  
 (ii) Combination

- (2) Solve the following Equation : 7  
 ${}^{11}P_n : {}^{12}P_n = 3 : 4$

**OR**

- (1) Out of four boys and six girls in how many ways a committee of five members can be formed in which 7  
 (i) There are at the most 2 boys  
 (ii) At least 2 girls.
- (2) In how many ways can the letters of the word "LAUGHTER" be arranged so that the vowels may never be separated ? Also find out if vowels are not together. 7

- (B) Write down any **three** answers of the following : 3

- (1) How many three digit numbers can be formed from the digit 0, 1, 2, 3, 4, 5, 6 if each digit can be used only once ?  
 (2) The formula for circular permutations of n things \_\_\_\_\_.  
 (3)  ${}^{10}C_3 + 2({}^{10}C_4) + {}^{10}C_5 = {}^{12}C_x$ , find value of x ?  
 (4) How many ways can the letter "ECONOMICS" be arranged ?

4. (A) (1) The cost y of manufacturing x units is partly constant and partly depends upon the number of units manufactured. If the cost of manufacturing 400 units is ₹ 1,100 and that of manufacturing 600 units is ₹ 1,500, find 7  
 (i) The linear relationship between x and y.  
 (ii) The slope of the line and interpret it.  
 (iii) The cost of manufacturing 500 units

- (2) Find the sum of n terms 7  
 $7 + 77 + 777 + 7777 + \dots$

**OR**

- (1) Obtain the equation of a straight line passing through two given points, A( $X_1, Y_1$ ) and B( $X_2, Y_2$ ) 7  
 (2) The sum of three numbers in A.P. is 24 and the sum of their squares is 200, find the numbers. 7

(B) Write down any **three** answers of the following :

3

- (1) Formula for finding the  $n^{\text{th}}$  term of A.P..
  - (2) What is the formula for finding out Slope in Perpendicular  $A(X_1, Y_1)$  and  $B(X_2, Y_2)$
  - (3) If the equation of a straight line is  $3x + 4y + 7 = 0$ , find its slope.
  - (4) Write down formula for G.P.
- 

@geniusgururji