



GAE-422-423

Seat No. \_\_\_\_\_

**B. Sc. (Sem. III) Examination**

November/December - 2015

**(1) ESMAT-21 : Business Mathematics-I**

**(2) EC-103 : Business Mathematics-I**

Time : 2 Hours]

[Total Marks : 50

**(1) ESMAT-21 : Business Mathematics-I**

Q:1 Attempt any Five :

(25)

- (1) Using truth table, prove that the statements  $(p \Rightarrow q)$ ,  $\sim q \Rightarrow \sim p$  and  $(\sim p \text{ or } q)$  are logically equivalent.
- (2) Write the following statement in symbolically. Also write the negation of this statement. "If triangle ABC is right angle then "there exist a feasible solution of equations  $2x+3y=1$  and  $x-2y=5$ ".
- (3) For  $A, B \in P(U)$ , if  $4.n(A) = 3.n(B) = 2.n(A \cup B)$  and  $n(A \cap B) = 15$  then find the value of  $n(A \cup B)$ , if possible.
- (4) For sets  $A = \{-3, -1, 2, 0, 3\}$ ,  $B = \{-2, 0, 2, 3\}$ ,  $C = \{-2, -1, 0, 1, 2, 3\}$  then, verify :  $A - (B \cap C) = (A - B) \cap (A - C)$ .
- (5) If  $A = \{12n+3 / n \in Z\}$  and  $B = \{18k-1 / k \in Z\}$  then find  $A \cup B$ ,  $A \cap B$  and  $A \Delta B$ .
- (6) For any given statements  $p, q, r$ , prepare the truth table of  $(p \text{ or } q) \Rightarrow (q \text{ or } r)$ .
- (7) Write the negation of the statement  $p \wedge (q \Rightarrow r)$  and verify by illustration.

**Q:2 Attempt any Five :**

(25)

- (1) If  ${}_{n+1}C_{r+1} : {}_n C_r : {}_{n-1}C_{r-1} = 11 : 6 : 3$  then find the value of  $n$  and  $r$ .
- (2) Find the sum of all numbers form by the digits 2,4,6,8 without repetition of digits.
- (3) If  ${}_{12}C_r = {}_{12}C_{r+2}$  then find the maximum value of  ${}_{12}C_r$ .
- (4) How many numbers divisible by 20, using the digits 0,1,2,3,4.
- (5) How many different words by using the letters of the word REKHA. Find the dictionary order of the word REKHA.
- (6) Find the maximum power of digit 3 in the expansion of  $50!$ .
- (7) How many ways we can arrange of 8 boys and 6 girls in a row in which no two particular girls sit together.

## (2) EC-103 : Business Mathematics-I

**Q:1 Attempt any Three :**

(30)

(1) Define the terms :

Basic solution, Unbounded solution, Slack and Surplus variables, Objective function.

(2) Solve the following LPP by Graphical method :

$$\text{Minimize } Z = x+y$$

Subject to constraints,  $5x + 10y \leq 50$  ;  $x + y \geq 1$  ;  $y \leq 4$  ;  $x, y \geq 0$ .

(3) Formulate the mathematical problem as a LPP and solve by graphical method.

A manufacturer has two machines A and B. He manufactures two products P and Q on these machines. For manufacturing products P he has to use machine A for 3 hours and B for 6 hours, and for manufacturing product Q he has to use machine A for 6 hours and machine B for 5 hours. On each unit of P he earns Rs. 4 and on each unit of Q he earns Rs. 5. How many units of P and Q should be manufactured to get maximum profit? Each machine cannot be used for more than 2100 hours.

(4) Solve graphically : Maximize  $Z = 2x + 3y$

Subject to the constraints,  $x+y \geq 1$  ;  $x-5y \leq 0$  ;  $5x-y \geq 0$  ,  $y-x \geq -1$  ;

$$x+y \leq 6, \quad y \leq 3 ; \quad x, y \geq 0.$$

**Q:2 Attempt any Two :**

(20)

(1) Find the equations of the regression lines from the data given below.

$$\bar{x} = 7.5 \quad \bar{y} = 12.5 \quad \sigma_x = 4.5 \quad \sigma_y = 9 \quad r = 0.9.$$

(2) Find the coefficient of rank correlation :

X	60	72	42	40	45	50	60	51	66
Y	35	30	52	54	48	50	30	35	25

(3) Two regression lines are  $2x+3y-1=0$  and  $x-2y+5=0$  and  $\sigma_x^2 = 12$  then find the value of  $x$ ,  $y$ ,  $\sigma_y^2$  and  $r$ .