

# END TERM EXAMINATION

FIRST SEMESTER [BBA] NOVEMBER-DECEMBER- 2016

Paper Code: BBA-105

Subject: Business Mathematics

BBA(TTM)-105

BBA(CAM)-105

Time: 3 Hours

Maximum Marks: 75

Note: Attempt any five questions. All questions carry equal marks.

- Q1 (a) Find the value of  $r$  if (i)  ${}^{10}C_r = {}^{20}C_{r+1}$  (ii)  ${}^{10}P_r = {}^{25}P_{r+2}$ .  
(b) In a firm there are 20 men and 10 women. In how many can you have a committee with 3 men and 2 women?
- Q2 (a) Verify whether vectors  $X_1=(2,2,-7)$ ,  $X_2=(2,1,2)$ ,  $X_3=(0,1,-3)$  are linearly dependent or independent.  
(b) Solve the following system of equations using Gauss elimination method.  
 $2xy - y + 3z = 9$ ;  $x + y + z = 6$  and  $x - y + z = 2$ .
- Q3 (a) Find the point of inflection of the curve  $y = x^3 - 3x^2 + 6x + 5$ . Also, find maxima and minima of  $y$ .  
(b) Find the extreme values of  $f(x, y, z) = 2x + 3y + z$  such that  $x^2 + y^2 = 5$  and  $x + z = 1$ .
- Q4 (a) Solve the differential equation  
 $(x^2 + 4y^2 + xy) dx = x^2 dy$   
(b) Solve  $(1 - x^2)(1 - y) dx = xy(1 + y) dy$
- Q5 Solve the following differential equations  
(a)  $\frac{dy}{dx} = 1 + x + y + xy$   
(b)  $\frac{dy}{dx} + x^2 = x^2 e^{3y}$   
(c)  $\frac{dy}{dx} + 1 = e^{x+y}$
- Q6 If  $a = 2i - j + 2k$  and  $b = 10i - 2j + 7k$ , find the value of  $a \times b$ . Also find the unit vector perpendicular to given vector.
- Q7 If  $a = 2i - j + 3k$ ,  $b = -i + 2j + k$  and  $c = 3i + j - 2k$  find  
(a)  $a \times b$   
(b)  $a \cdot b$   
(c)  $a \cdot (a \times b)$   
(d)  $a \times (b \times c)$