AT-5394

Seat No. _____

First Year B. B. A. Examination

March / April – 2016

Business Mathematics

(Old Course)

Time : **3** Hours] [Total Marks : **100**

Instructions : (1) Attempt all five questions.
(2) Figures to the right indicate marks.

1 (a) Prove that $^{n}C_{r} = \frac{n!}{r!(n-r)!}$. **10**

(b) Find the value of n **10**

(i) $4 \times np_3 = 5(n-1)p_3$

(ii) $(n-1)p_3 : (n+1)p_3 = 5:12$

OR

1 (a) Prove that $S_n = \frac{a(r^n - 1)}{r-1}$. **10**

(b) Find three numbers in A.P. whose sum is 9 and the product is –165. **10**

2 (a) Explain : Gauss-Elimination method. **10**

(b) $2x+3y-z=9,, x+y+z=9$ and $3x-y-z=-1$ using Gauss-Elimination method. **10**

OR

2 (a) Find the roots of the equation $ax^2+bx+c=0$. **10**

(b) Solve $\sqrt{\frac{x}{1-x}} + \sqrt{\frac{1-x}{x}} = 13/6$. **10**

3 (a) Find the value of $\left(\sqrt{5}+1\right)^5-\left(\sqrt{5}-1\right)^5$. **10**

(b) Find the term independent of x in the expansion of $\left(x-\frac{1}{x}\right)^{10}$. **10**

OR

3 (a) Find dy/dx : (any two) **10**

(i) $y=\frac{3x^2+5x}{7x+4}$

(ii) $y=\frac{(1-x)^2}{x^2}$

(iii) $y=\left(x^2+3x+1\right)^4$

(iv) $y=\frac{\sqrt{x}+2}{\sqrt{x}}$

(b) Integrate w.r. to x : (any **two**) **10**

(i) $\int x\left(x^2+4\right)^5 dx$

(ii) $\int \frac{2^x e^x+e^{2x}}{e^x} dx$

(iii) $\int x^2 e^x dx$

(iv) $\int x(x-1)\left(1-\frac{1}{x}\right) dx$

4 (a) State the rules of determinant. **10**

(b) Solve the equations by Cramer's Rule. **10**

$x+y+2z=4,$

$2x-y+3z=9$

$3x-y-z=2$

OR

4 (a) Find the maximum and minimum values of **10**

$$f(k)=\frac{x^3}{3}-2x^2+3x+1$$

(b) Find the value of $\int_6^{10}\frac{x-2}{x+2}dx$. **10**

5 (a) Explain the following terms : **10**

Diagonal matrix, Inverse matrix, Null matrix, Transpose matrix, Unit matrix

(b) Solve the equation by Inverse matrix. **10**

$x+y+2z=4$

$2x-y+3z=9$

$3x-y-z=2$

OR

5 (a) Short note : Newton's Backward Method. **10**

(b) If $f(5)=12,\ f(6)=10,\ f(9)=14,\ f(11)=16$ find $f(10)$ by Lagrange's method. **10**