



KA-2523

First Year B. Com. (Sem. I) (Honours) Examination
October/November – 2012
Mathematics & Statistics

Time : 3 Hours]

[Total Marks : 70

Instructions :

(1)

नीचे दर्शायेव निशानीवाणी विगतो उत्तरवडी पर अवश्य कपवी. Fillup strictly the details of signs on your answer book.	Seat No. :
Name of the Examination :	<input type="text"/>
<input type="text" value="FIRST YEAR B. COM. (SEM. I) (HONOURS)"/>	<input type="text"/>
Name of the Subject :	<input type="text"/>
<input type="text" value="MATHEMATICS & STATISTICS"/>	<input type="text"/>
Subject Code No. : <input type="text" value="2"/> <input type="text" value="5"/> <input type="text" value="2"/> <input type="text" value="3"/>	<input type="text"/>
Section No. (1, 2,.....): <input type="text" value="Nil"/>	
Student's Signature	

- (2) Answer all the questions.
(3) Figures to the right indicate full marks of the questions.

- 1 (a) Explain the following terms : 4
Transpose of a matrix, Symmetric matrix, Diagonal matrix, Square matrix.
- (b) If $A = \begin{bmatrix} 1 & 2 \\ -2 & 0 \end{bmatrix}$ and $B = \begin{bmatrix} -3 & 2 \\ -2 & -4 \end{bmatrix}$, then prove that 4
 $(A+B)^2 = A^2 + 2AB + B^2$.
- (c) Solve the following equations by using inverse of 6
a matrix
 $3x + y - 5 = 0, 2x + 5y + 1 = 0$

- 2 (a) Give the definition of matrix. State the difference between matrix and determinant. 4

(b) If $A = \begin{bmatrix} 1 & 2 & 0 \\ -1 & 3 & -5 \\ 2 & 0 & 4 \end{bmatrix}$, then find $A^2 - 5A + 3I$. 4

- (c) Solve the following equations by using inverse of a matrix $x + 2y + 3z = 1$, $2x + 3y + 2z = 2$, $3x + 3y + 4z = 1$. 6

- 3 (a) Evaluate : 9

(i) $\lim_{n \rightarrow 2} 2 \left[\frac{1}{n^3 - n} + \frac{2}{n^3 - n} + \frac{3}{n^3 - n} + \dots + \frac{n}{n^3 - n} \right]$

(ii) $\lim_{x \rightarrow -5} \frac{x^2 - 25}{x + 5}$

(iii) $\lim_{x \rightarrow 1} \left[\log x + \frac{1 - x}{1 - \sqrt{x}} \right]$

- (b) If the demand function of a commodity is $x^2 = 108 - P$, then how many units should be produced to get maximum revenue ? 5

- 4 (a) Evaluate : 9

(i) $\int_2^3 \frac{x^2 + 2x - 15}{x - 3} dx$

(ii) $\int_{-2}^2 \frac{1 - x^2}{1 + x} dx$

(iii) $\int \frac{x + 5}{x - 7} dx$

(b) If $y = \frac{e^x}{\log x}$, then find $\frac{dy}{dx}$. **3**

(c) $\lim_{x \rightarrow 4} \frac{\sqrt{x}-1}{x-3}$. **2**

5 (a) If $A = \begin{bmatrix} 1 & 2 & 2 \\ 1 & 2 & 2 \\ 2 & 2 & 1 \end{bmatrix}$ then obtain, $A^2 - A + I$. **4**

(b) Evaluate : **4**

$$\int \left[1 + \frac{1}{x}\right] \left[1 + \frac{1}{1+x}\right] dx.$$

(c) Evaluate :

(i) $\lim_{n \rightarrow \infty} 4 \left[\frac{1^3 + 2^3 + 3^3 + \dots + n^3}{n^4} \right]$ **3**

(ii) If $y = e^x \cdot \log x$, find $\frac{dy}{dx}$. **3**