F.Y.B.B.A.

Paper-106

Quantitative Techniques & Application in Business

April 2016 – 8048

Time: 3 Hours | Total Marks: 100

Instructions: 1.Attempt All Questions.
2.Use of Calculator, Statistical Table is permitted

Q-1 (a) Define the following Terms. [10]

i. function ii. Onto function
iii. Disjoint Set iv. Difference of Two Set (v) Singleton Set

(b) Evaluate the following: [10]

(i) $\lim_{x \to 3} \frac{x^2 - 5x + 6}{x^2 - 9x + 18}$ (ii) $\lim_{x \to 1} \frac{\sqrt{x+2} - \sqrt{3}}{x - 1}$

OR

Q-1 (a) Define the following Terms. [10]

(i) Set (ii) Inverse function
(iii) Power Set (iv) Many One Function (v) Equal function

(b) Evaluate the following: [10]

1) $\lim_{x \to 5} \frac{7^{2x} - 3^{3x}}{x}$ 2) $\lim_{x \to 5} \frac{1 - \sqrt{x-4}}{x - 5}$

Q-2 (a) (1) Define the following terms: [8]

i. Null Matrix ii. Square Matrix
iii. Symmetric Matrix iv. Non-Singular matrix

(b) Solve the following system of equations by matrix inversion method [12]

$$2x - y + 2z = 6$$
$$x - 2y + 3z = 6$$
$$3x - 3y - z = -6$$

OR

Q-2 (a) Define the following terms: [8]

i. Unit Matrix ii. Transpose of a matrix
iii. Diagonal Matrix iv. Skew-Symmetric Matrix

(b) Prove that $\begin{vmatrix} 1 & x & yz \\ 1 & y & zx \\ 1 & z & xy \end{vmatrix} = (x-y)(y-z)(z-x)$ [5]

(c) Find Maximum and Minimum value of the given function. [7]

$$f(x) = x^3 - 6x^2 + 9x + 6$$

Q-3 (a) Define the following terms: [8]

i. mean ii. median

iii quartile deviation iv. coefficient of variation

(b) Find mode, quartile deviation and percentile P_{49} from the following data. [12]

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No. of student	4	8	11	15	13	6	3

OR

Q-3 (a) Define the following terms: [8]

i. weighted mean ii. mode

iv. mean deviation v. standard deviation

(b) Weights of 100 students of a certain University are as follows . Find out Standard deviation, Mean deviation and Coefficient of variation . [12]

Weight (Kg)	60-62	62-64	64-66	66-68	68-70	70-72
No. of women	5	18	40	27	8	2

Q-4 (a) Define the following terms. [10]

i. probability ii. favourable event iii. mutually exclusive event

iv . independent event v. equally likely event

(b) 1) Define binomial distribution.State its important properties. [5]

2) A typist claim on an average one mistake in each page. One page drawn at random from his typed pages. If his claim is true ,find the probability of getting at the most 3 mistake in a page. [5]

OR

Q-4 (a) (1) Define Poisson distribution. State its important properties. [8]

(b) 2000 candidates appeared for a certain examination. The mean marks was 59 and the standard deviation was 5.Assuming the distribution to be normal ,find [12]

(i) no. of students getting more than 64 marks

(ii) no. of students getting Marks between 45 to 55.

(iii) no. of students failed in the examination if standard of passing is 40 marks.

Q-5 (a) Define the following Terms: [10]

i). statistics ii). parameter iii). hypothesis

iv). type II error v). level of significance

(b) 1). Define regression. State its important properties. [5]

2). Calculate the correlation coefficient between the height of father and height of son from the given data. [5]

Height of father (in inches)	64	65	66	67	68	69	70
Height of Son (in inches)	66	67	65	68	70	68	72

OR

Q-5 (a) State advantages and disadvantages of sample survey. [8]

(b) From the following data, find two lines of regression, coefficient of correlation between the marks in Mathematics and Statistics The most likely marks in Statistics when marks in Mathematics is 33. [12]

Marks in Maths.	25	28	35	32	31	36	29	38	34	32
Marks in Stats.	43	46	49	41	36	32	31	30	33	39