Subject code : 21319

12 DEC 2018

B.Com (Honours) Sem-1 Examination

Time: 02.30 hours **Business Statistics & Maths** **Total marks: 70**

1. **(a)** Find (i) $x \xrightarrow{lim} 0 \frac{\sqrt{1+x}-1}{x}$ (ii) $x \xrightarrow{lim} 3\left(\frac{1}{x-3} - \frac{3}{x^2-3x}\right)$ **6**

   (b) (i) If $y = \frac{x+\log x}{5-11x}$, $find\ \frac{dy}{dx}$ **8**

   (ii) If $y = x^3 \log\frac{1}{x}$, prove that $x\frac{dy}{dx} + x^3 = 3y$

   (c) Evaluate (i) $\int \frac{x^3}{x-1}dx$ (ii) $\int_{-1}^{1}(2x^2 - x^3)dx$ **6**

OR

1. **(a)** Find (i) $x \xrightarrow{lim} -3 \frac{2x^2+9x+9}{2x^2+7x+3}$ (ii) $n \xrightarrow{lim} \infty \frac{\Sigma n^2}{n^3}$ **6**

   (b) (i) If $y = e^{\sqrt{2x^2+3x+1}}$, find $\frac{dy}{dx}$. **8**

   (ii) If $y = x^2.e^{2x}$, find $\frac{d^2y}{dx^2}$.

   (c) Evaluate (i) $\int \frac{x^4+1}{x^2}dx$ (ii) $\int_{-3}^{3}(11 + 2x^2 + x^4)dx$ **6**

2. **(a)** What do you mean by tabulation? What are the objectives and advantages of tabulation? **4**

   (b) From the prices of shares of x and y below, find out which is more stable in values? **8**

x	35	54	52	53	56	58	52	50	51	49
y	108	107	105	105	106	107	104	103	104	101

   (c) Calculate mean, median and mode from the following data. **8**

Class	0-20	20-40	40-60	60-80	80-100
frequency	3	17	27	20	8

OR

2. **(a)** What is classification? Describe in brief the purpose and importance of classification? **4**

   (b) From the following distribution, (i) Find out the missing frequency if the median is 35. (ii) Also find the arithmetic mean of the completed table. **8**

Variable	0-10	10-20	20-30	30-40	40-50	50-60	60-70
Frequency	10	20	?	40	?	25	15

   The total frequency =170.

   (c) From the following data, compute the quartile deviation. **8**

Class	50-53	53-56	56-59	59-62	62-65	65-68
Frequency	2	7	24	27	13	3

3. **(a)** What is correlation? Explain rank correlation method. **3**

   (b) From the following data, calculate Karl Pearson's coefficient of correlation. **6**

X	45	70	65	40	80	40	50	70	85	60
Y	35	80	70	40	90	45	60	80	80	50

   (c) Compute the two regression equations on the basis of the following information. Also estimate the value of X for Y=70, using the appropriate regression lines. **6**

   $\bar{X} = 35.6, \bar{Y} = 84.8, \sigma_x = 10.5, \sigma_y = 8.5, r = 0.62$

OR

3. **(a)** What is regression? Explain the difference between correlation and regression? **3**

(b) Calculate Spearman's rank correlation coefficient between the two series X and Y and comment on the result. **5**

X	70	48	58	55	54	50	60	52
Y	62	47	53	60	55	68	51	48

(c) Regression equations of two variables X and Y are as follows: **7**

$$8X - 10Y = -64, \text{ and } 40X - 18Y = 320.$$

Find (i) the means (ii) the regression coefficients, and (iii) the coefficient of correlation between X and Y.

4. **(a)** Explain statistical definition of probability. Also explain Baye's theorem. **4**

(b) There are 100 printing mistakes in a book of 100 pages. Find the probability that a page selected at random has: **5**

(i) No mistake

(ii) Maximum 2 mistakes. $(e^{-1} = 0.3679)$

(c) 5% of the observations of a normal distribution are less than 12 and 45% are less than 36. Find mean and standard deviation of the distribution. **6**

OR

4. **(a)** Define Poisson distribution. State its properties and uses. **5**

(b) There are two defective pencils in a pack of dozen pencils. If three pencils are selected at random, find the probabilities that (i) at the most one pencil is defective; (ii) two pencils are defective. **5**

(c) The average height of a group of soldiers is 68.22" and the variance of heights is 10.89. Out of 1000 soldiers, how many soldiers do you expect to be at least 6 feet tall? **5**