LF-133

April-2014

S.Y. M.B.A. (K.S) (Integrated)

Business Statistics

Time : 3 Hours]   **[Max. Marks : 100**

Instructions :   (1)   Non-programmable scientific calculator can be used.

                 (2)   Statistical tables will be provided on request.

                 (3)   Write new question on new page.

1.   Solve the following : (Any **two**)   **20**

    (1)   The incidence of occupational disease in an industry is such that the workers have 20 per cent chance of suffering from it. What is the probability that out of six workers 4 or more will come in contact of the disease ?

    (2)   The following table gives the number of days in a 50 day period during which automobile accidents occurred in a city :

No. of accidents:	0	1	2	3	4
No. of days :	21	18	7	3	1

        Fit Poisson distribution to the data.

    (3)   A company produces and ships 16 personal computers knowing that four of them have defective wiring. The company that purchased the computers is going to thoroughly test three of the computers. The purchasing company can detect the defective wiring. What is the probability that the purchasing company will find the following ?

       (i)   No defective computers.

       (ii)   Exactly three defective computers.

       (iii)   Two or more defective computers.

       (iv)   One or fewer defective computers.

2. Solve the following : (Any **two**) **20**

(1) The average fill volume of a regular Can of soft drink is 12 ounces. Suppose the fill volume of these Can ranges from 11.97 to 12.03 ounces and is uniformly distributed, what is the height of the distribution ? What is the probability that a randomly selected Can contains more than 12.01 ounces of fluid ? What is the probability that the fill volume is between 11.98 and 12.01 ounces ?

(2) During the summer at a small private airport in western Nebnaska, the unscheduled arrival of airplanes is Poisson distributed with an average arrival rate of 1.12 planes per hour.

(i) What is the average inter-arrival time between planes ?

(ii) What is the probability that atleast 2 hours will elapse between plane arrivals ?

(iii) What is the probability of two planes arriving less than 10 minutes apart ?

(3) Of a large group of men, 4 percent are under 60 inches in height and 40 percent are between 60 and 65 inches. Assuming a normal distribution, find the mean height and standard deviation.

3. Solve the following : (Any **two**) **20**

(1) The following table gives the distribution of items of production and also the relatively defective items among them, according to size groups. Find the correlation coefficient between size and percentage of defective in quality.

Size group :	15 – 16	16 – 17	17 – 18	18 – 19	19 – 20	20 – 21
No. of items :	200	270	340	360	400	300
No. of defective items :	150	162	170	180	180	114

(2) A financial analyst wanted to find out whether inventory turnover influences any company's earnings per share (in percent). A random sample of 7 companies listed in a stock exchange was selected and the following data was recorded for each :

Company :	A	B	C	D	E	F	G
Inventory turnover (No. of times) :	4	5	7	8	6	3	5
Earning per share (Percent) :	11	9	13	7	13	8	8

Find the strength of Spearman's rank correlation between inventory turnover and earnings per share.

(3) In all there were 1500 students studying in a college and 20% of them were residing in hostel. Of the total strength 92% passed in the examination and the number of students residing in hostel among failures was 20 less than those not residing in the hostel. Determine the coefficient of association between residence in hostel and passing in the examination.

4. (a) (1) Define regression and properties of regression coefficient. **5**

(2) In a partially destroyed laboratory record of an analysis of regression data, the following results only are legible : **5**

Variance of $x = 9$

Regression equations are $8x - 10y + 66 = 0$ and $40x - 18y = 214$

Find on the basis of the above information :

(i) The mean value of x and y.

(ii) Coefficient correlation between x and y.

(iii) Standard deviation of y.

(b) The following bivariate frequency distribution relates to sales turnover (₹ in lakh) and money spent on advertising (₹ in thousands). Obtain the two regression equations : **10**

Sales Turnover (₹ in lakh)	Advertising Budget (₹ in thousands)			
	50 – 60	60 – 70	70 – 80	80 – 90
20 – 50	2	1	2	5
50 – 80	3	4	7	6
80 – 110	1	5	8	6
110 – 140	2	7	9	2

Estimate :

(i) The sales turnover corresponding to advertising budget of ₹ 1,50,000.

(ii) The advertising budget to achieve a sales turnover of ₹ 200 lakh.

5. Solve following : **20**

(1) The prices of a commodity during 2005-2010 are given below. Fit a second degree parabola to these data. Also estimate the price of the commodity for the year 2004 :

Year	Price	Year	Price
2005	100	2008	140
2006	107	2009	181
2007	128	2010	192

(2) Calculate the seasonal Index by method of moving average from the following data :

Year	Quarter			
	I	II	III	IV
2009	75	60	53	59
2010	86	65	63	80
2011	90	72	66	85
2012	100	78	72	93

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