

Seat No. : \_\_\_\_\_

# MT-133

March-2019

Second Year, M.B.A., (Integrated), Sem.-IV

## Business Statistics

Time : 2:30 Hours]

[Max. Marks : 70

- Instructions :** (1) Non-Programmable Scientific Calculator can be used.  
(2) Statistical Tables will be provided on request.

1. Attempt any **two** from the following : 14
- (1) Explain Binomial Distribution. Also gives its properties and uses.
  - (2) A consumer electronics company has 24 showrooms located across India. Out of these 24 showrooms, 12 are located in Gujarat. If five showrooms are selected at random from the entire list, what is the probability that one or more randomly selected showrooms are located in Gujarat ?
  - (3) Major problems in aircraft landing are very rare in an international airport. The numbers of major problems are Poisson distributed with mean 5 per year.
    - (i) What is the probability that no major problem will occur in a year ?
    - (ii) What is the probability that three or fewer major problems will occur in a year ?
2. Answer any **two** from the following : 14
- (1) A placement company has conducted a written test to recruit people in a software company. Assume that the test marks are normally distributed with mean 120 and standard deviation 50. Calculate the following :
    - (i) Probability of randomly obtaining scores greater than 200 in the test.
    - (ii) Probability of randomly obtaining a score less than 80 in the test.
    - (iii) Probability of randomly obtaining a score between 70 to 170 in the test.
  - (2) Royal Footwear is a shoe manufacturing company. Royal Plus is a newly launched shoe. The retail price of the new brand varies from ₹ 750 to ₹ 800. Assume that these prices are uniformly distributed. If a shoe is randomly selected from a retail store, what is the probability that its prices will be between ₹ 770 to ₹ 780 ? Also calculate average price, standard deviation and the variance of the distribution.

- (3) In a busy departmental store, the arrival of customers is Poisson distributed with an average arrival rate of 1.12 per minute.
- What is the probability that at least 5 minutes will elapse between arrivals ?
  - What is the probability that at most 3 minutes will elapse between arrivals ?

3. Attempt any **two** from the following :

14

- (1) Calculate the correlation coefficient from the following data by the method of concurrent deviations :

<b>Marks in Statistics</b>	65	40	35	75	63	80	35	20	80	60	50
<b>Marks in Accountancy</b>	60	55	50	56	30	70	40	35	80	75	80

- (2) Out of 2000 people exposed to small pox in a village 450 were attacked. Among the people, 365 were vaccinated and out of them 50 were attacked. Find whether vaccination can be regarded as a good preventive by coefficient of association.
- (3) For 10 pairs of observations  $r = 0.5$ . The means of X and Y are 12 and 15 respectively and their standard deviations are 3 and 4 respectively. While calculating one pair (15, 13) was wrongly taken as (16, 18). Find the correct value of correlation co-efficient.

4. Answer any **two** from the following :

14

- (1) For bivariate sample average of  $X = 53.2$ , average of  $Y = 27.9$ ,  $b_{xy} = -1.5$ ,  $b_{yx} = -0.2$ , find the estimate of Y for  $X = 60$  and also obtain the correlation co-efficient between X and Y.
- (2) The equations of lines of regression for two variables X and Y are  $3X + 2Y - 26 = 0$  and  $6X + Y - 31 = 0$ , and the variance of X is 25. Find the average of X, average of Y, correlation coefficient and  $S_y$
- (3) In random sample of size 28,  $b_{xy} = -1.5$  and  $S_y^2 / S_x^2 = 0.25$ . Find  $r_{xy}$  and  $b_{yx}$ .

**OR**

Obtain two regression lines from the following data :

Height	Weight			
	90-100	100-110	110-120	120-130
50-55	4	7	5	2
55-60	6	10	7	4
60-65	6	12	10	7
65-70	3	8	6	3

- Find the correlation coefficient between height and weight.
- Estimate height when weight is 115.
- Estimate weight when height is 62.

5. Answer the following :

14

- (1) What is Time Series ? Also explain different components of Time Series.
- (2) Construct quadratic trend for the following data. Also forecast the value for the year 2018.

Years	Sales (in millions rupees)
2008	1100
2009	1150
2010	1200
2011	1250
2012	1300
2013	1220
2014	1180
2015	1330
2016	1400
2017	1250

**OR**

Calculate the seasonal indices by method of moving average and deseasonalized the data :

Year	Quarter			
	I	II	III	IV
2013	2022	2100	2150	2120
2014	2200	2250	2150	2340
2015	2250	2300	2350	2250
2016	2400	2450	2300	2270
2017	2500	2560	2400	2350

