Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MBA (PART TIME) SEMESTER 01 - EXAMINATION – SUMMER-2018

Subject Code: 3519906 **Date:04/05/2018**

Subject Name: Business Statistics

Time: 10:30 AM To 01:30 PM **Total Marks: 70**

Instructions:

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

Q.1 **Explain in short** **14**

(a) Define Kurtosis.
(b) State addition & multiplication rule of probability for two events A & B.
(c) What is Standard Normal Distribution?
(d) What is discrete and continuous variable?
(e) What is auto-correlation?
(f) What are the components of a time series?
(g) What is Hurwicz Criteria in decision making?

Q.2 **(a)** Enlist different types of charts and graphs to display **07**

1) Qualitative data
2) Quantitative data

(b) Calculate Karl Pearson's coefficient of skewness from the data given below: **07**

Hourly Wages (Rs.)	No. of Workers	Hourly Wages (Rs.)	No. of Workers
40-50	5	90-100	30
50-60	6	100-110	36
60-70	8	110-120	50
70-80	10	120-130	60
80-90	25	130-140	70

OR

(b) Find the mean, Median and Mode of the following data **07**

Class	Frequency
300-325	5
325-350	17
350-375	80
375-400	227
400-425	326
425-450	248
450-475	88
475-500	9

Q.3 **(a)** Suppose that a decision maker is faced with three decision alternatives and four states of nature. The following table shows the profit payoff. **07**

Alternatives	States of nature			
	S1	S2	S3	S4
A1	16	10	12	7
A2	13	12	9	9
A3	11	14	15	14

Assuming that he does not have any knowledge of the of the probabilities of occurrence of the states of nature, find the decisions to be recommended under each of the following criteria

1) Maximin
2) Maximax
3) Minimax Regret

(b) The probability of a bomb hitting a target is 0.2. Two bombs are enough to destroy a bridge. If six bombs are aimed at the bridge, find the probability that the bridge is destroyed. **07**

OR

Q.3 **(a)** A maker of soft drinks is considering the introduction of new brand. He expects to sell 50,000 to 1,00,000 bottles of the new soft drink in a given period according to the following probability distribution. **07**

No. of bottles sold (in '000s)	50	60	70	80	90	100
Probability	0.13	0.20	0.35	0.22	0.08	0.02

If the product is launched he will have to incur a fixed cost of Rs. 48,000. However each bottle sold would give him a profit of Rs. 1.25. Should he introduce the brand?

(b) A manufacturer, who produces medicine bottles, finds that 0.1% of the bottles are defectives. Bottles are packed in boxes containing 500 bottles. A drug manufacturer buys 100 boxes from the producers of bottles. Using Poisson distribution, find how many boxes will contain **07**

1) No defectives.
2) At least 2 defectives.

Q.4 **(a)** Explain different types of correlations with the help of scatter diagrams. **07**

(b) From the following data calculate price index numbers for 2010 with 2000 as base year by 1) Paasche's Method and 2) Marshall-Edgeworth method. **07**

Commodities	2000		2010	
	Price	Quantity	Price	Quantity
A	20	8	40	6
B	50	10	60	5
C	40	15	50	15
D	20	20	20	25

OR

Q.4 **(a)** Explain the assumptions of simple linear regression model **07**

(b) Calculate (i) three yearly & (ii) five yearly moving averages for the following data: **07**

Year	y
1990	242
1991	250
1992	252
1993	249
1994	253
1995	255
1996	251
1997	257
1998	260
1999	265
2000	262

Q.5 A departmental store gives in-service training to its salesmen which is followed by a test. It is considering whether it should terminate the services of any salesman who does not do well in the test.

The following data shows the test scores and sales made by nine salesmen during a certain period:

Test Scores	14	19	24	21	26	22	15	20	19
Sales ('000 Rs.)	31	36	48	37	50	45	33	41	39

a) Calculate the coefficient of correlation between the test scores and the sales. **7**

7

b) Estimate the most probable sales volume of a salesman making a score of 28.

OR **7**

c) If the firm wants a minimum sales volume of Rs. 30,000, what is the minimum test score that will ensure continuation of service? **7**

d) Estimate what will be the score if a salesman has achieved a sales of Rs. 55,000.

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