PG Odd Semester (CBCS) Exam., December—2018

COMMERCE

(1st Semester)

Course No. : COMCC–102

(Business Statistics)

Full Marks : 70
Pass Marks : 28

Time : 3 hours

The figures in the margin indicate full marks for the questions

Answer **five** questions, taking **one** from each Unit

UNIT—I

1. *(a)* Define mathematical definition of probability. 3

(b) State and explain the theorem of addition of probability. 3

(c) Four cards are drawn at random from a pack of 52 cards. Find the probability that *(i)* all are diamonds and *(ii)* there is one card of each suit. 4+4=8

2. *(a)* Mention four properties of normal distribution. 4

(b) Mention three practical situations where Poisson distribution can be used. 3

(c) If 5% of the electric bulbs manufactured by a company are defective, use Poisson distribution to find the probability that in a sample of 100 bulbs—

(i) none is defective;

(ii) 5 bulbs will be defective.

Given e^{5} 0·007. 4+3=7

UNIT—II

3. *(a)* Distinguish between sample survey and census. 4

(b) Write a short note on any *one* of the following : 4

t-test; *z*-test

(c) In a random sample of 400 persons from a large population 120 are females. Can it be said that males and females are in the ratio 5 : 3 in the population? Use 1% level of significance. 6

4. *(a)* Write a note on *t*-test. 4

(b) Distinguish between census and sample. 3

(c) A soap manufacturing company was distributing a particular brand of soap through a large number of retail shops. Before a heavy advertisement campaign the mean sale per week per shop was 140 dozens. After the campaign, a sample of 26 shops was taken and the mean sales was found to be 147 dozens with standard deviation 16. Can you consider the advertisement effective? [Given $t_{0\ 05,\ 25}$ 1·708] 7

UNIT—III

5. (a) Discuss the sign test. 4

(b) Discuss the uses of ^{2}-test. 4

(c) To test the effectiveness of inoculation against cholera the following table was obtained :

	No. of Persons	
	Attacked	*Not Attacked*
Inoculated	30	160
Not inoculated	140	400

Does inoculation prevent attack from cholera?

[Given $^2_{0\ 05,\ 1}$ 3·84, $^2_{0\ 05,\ 2}$ 599, $^2_{0\ 05,\ 3}$ 7·815] 6

6. (a) Discuss Krushkal-Wallis test. 5

(b) Write a note on sign test. 5

(c) Why is run test used? Write down the formula for run test. 1+2=3

(d) Mention one application of ^{2}-test. 1

UNIT—IV

7. (a) Discuss the various components of time series. 7

(b) Fit a linear trend to the following data by the least squares method and find the production of 1999 : 7

Year	1990	1992	1994	1996	1998
Production (000' unit)	18	21	23	27	16

8. (a) Write short notes on the following : 4+4=8

(i) Uses of multiple regression analysis

(ii) Partial correlation

(b) For a large group of students X_1 score in theory, X_2 score in method, X_3 score in fieldwork. Given, $_{12}$ 0 69, $_{13}$ 0 45 and $_{22}$ 0 58. Calculate multiple correlation coefficient $R_{3\ 12}$. 6

UNIT—V

9. *(a)* Write a note on advantages of statistical quality control. 4

(b) Write a note on control chart. 4

(c) Discuss the control chart for attributes. 6

10. *(a)* Write a note on 3-sigma limit.

(b) Construct a control chart for mean and range for the following data on the basis of fuses, sample of 5 being taken every hour (each set of 5 has been arranged in ascending order of magnitude) : 14

42	42	19	30	36	42	51
60	18	65	45	24	54	51
74	60	20	75	68	80	69
57	78	72	27	78	72	81
77	59	78	45	42	87	90
81	84	78	132	138	60	15
69	64	61	30	109	90	78
39	113	93	93	94	62	109
109	84	153	112	136	118	

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