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 the following : 2+2+2=6

(i) Mutually exclusive events

(ii) Exhaustive cases

(iii) Conditional probability

(b) In a single throw with two uniform dice, find the probability of getting *(i)* five; *(ii)* eight. 3+3=6

(c) State the theorem of addition of probability. 2

2. *(a)* Mention the conditions under which binomial distribution can be used. 3

(b) Mention five properties of binomial distribution. 5

(c) If the probability of a defective bolt is 1/10, find *(i)* the mean, *(ii)* variance for the distribution of defective bolts as a total of 400. 6

UNIT—II

3. *(a)* Write down different steps for application of Z test. 4

(b) Write short notes on (any *two*) : 2½+2½=5

(i) Null hypothesis

(ii) Level of significance

(iii) Type I error and Type II error

(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. 5

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

(b) Distinguish between census and sampling. 3

(c) A soap manufacturing company was distributing a particular brand of soap through a large number of retail shops. Before a heaving 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? $[t_{9,\,25}\ \ 1\ 708]$. 7

UNIT—III

5. *(a)* Mention four properties of chi-squared distribution. 4

(b) Write a note on goodness of fit. 5

(c) Write a note on run tests. 5

6. *(a)* Write a note on Kruskal-Walle's tests. 4

(b) To test the effectiveness of inoculation against cholera, the following table were obtained :

	Number of persons	
	Attacked	*Not attacked*
Inoculated	30	160
Not inoculated	140	400

Does inoculation prevent attack from cholera? Given

$^{2}_{05,1}\ \ 3\ \ 84,\quad ^{2}_{05,\,2}\ \ 5\ \ 99$

$^{2}_{05,3}\ \ 7\ \ 815.$ 6

(c) To test the claim that the median age of commerce faculty in the colleges of Assam University is at least 42 years, the results from a random sample of 32 commerce faculty given the following ages (in years) :

56	62	61	54	52	32
24	35	50	42	52	49
26	31	31	54	38	36
45	53	37	40	38	31
29	25	45	52	48	39
30	38				

Use the sign test at the ·05 level of significance to test the claim. 4

UNIT—IV

7. *(a)* Interpret

r 0, r 1, r 1 — 3

(b) Write short notes on any *two* of the following : 3+3=6

(i) Partical correlation

(ii) Multiple regression

(iii) Regression

(c) For a large group of students,

X_1 score in theory

X_2 score in method

X_3 score in field work

Given r_{12} 69, r_{13} 45, r_{22} 88

calculate multiple correlation coefficient $R_{3\ 12}$. 5

8. *(a)* Discuss the various components of a time series. 8

(b) Below are given the figures of production (in 000 ton) of a sugar factory

Year :	1999	2000	2001	2002	2003	2004	2005
Production :	17	88	94	85	91	98	98

Fit a straight line by the method of least squares and estimate the production of 2006. 5+1=6

UNIT—V

9. *(a)* Discuss the advantages of statistical quality control. 5

(b) Write a note on control chart. 5

(c) Write a note on control chart for attributes. 4

10. *(a)* Write a note on 3-sigma limit. 4

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

42	42	19	36	42	51	60	18
65	45	24	54	51	74	60	20
75	68	80	69	57	75	72	27
78	72	81	77	59	78	95	42
87	90	81	84	78	132	138	60
15	69	64	61	30	109	90	78
39	113	93	94	62	108	109	84
153	112	136	118				

5+5=10

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