M.Com. 2nd Semester Examination, 2010

ADVANCED BUSINESS STATISTICS

PAPER — CM-1203

Full Marks : 50

Time : 2 hours

The figures in the right-hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

UNIT—I

1. Answer any *two* questions :   5 × 2

   (a) What do you mean by 'Uniform Distribution' ? Explain with example.

   (b) In the year 2010, 500 students have been appeared in B.Com. examination. The minimum percentage for qualifying the examination is 40% and the minimum

percentage for getting a first class is 60%. If the average percentage obtained by all the students taking together is 54%, with a Standard Deviation of 4% then find —

(i) The expected number of students who have got first class.

(ii) The expected number of students has disqualified.

(c) Write a critical note on the merits and limitations of Judgement sampling.

(d) The weather record shows that on an average 5 out of 31 days in November are rainy days. Assuming a binomial distribution, find the probability that in the next November there will have (i) no rainy day and (ii) at most three rainy days.

2. Answer any *one* question :   10 x 1

(a) (i) "Sampling is a necessity under certain conditions." Illustrate this with suitable examples.

   (ii) What do you mean by non-sampling error ? How does it arise in the process of sampling ?   4 + (2 + 4)

(*Continued*)

(b) (i) Prove that the mean and variance of Poisson distribution are equal.

(ii) Records show that the probability is 0·00002 that a car will have a flat tyre while driving over a certain bridge. Use the Poisson probability distribution to find the probability that among 20,000 cars driven over this bridge, not more than one will have a flat tyre.

[Given $e^{-0.2} = 0.819$, $e^{-0.4} = 0.670$]. 6 + 4

UNIT—II

3. Answer any *two* questions : 5×2

(a) Distinguish between parametric and non-parametric methods for testing a statistical hypothesis.

(b) A tossed a biased coin 50 times and got 20 heads, while B tossed it 90 times and got 40 heads. Find the maximum likelihood estimate of the probability of getting head when the coin is tossed.

(c) Distinguish between :

(i) Point estimation and Interval estimation.

(ii) One tailed and Two tailed test.

(d) A random sample of size 100 has mean 15, and the population variance is known as 25. Find the interval estimate of the population mean with a confidence level of (i) 95% and (ii) 99%.

4. Answer any *one* question :   10 × 1

(a) (i) What is ANOVA? Write down its basic assumptions.

(ii) The following table gives the yield of a hybrid variety of wheat, in quintals per acre, from 17 trial plots of land treated with four types of fertilizers.

Yield of wheat with fertilizers :			
A	B	C	D
24	31	39	38
39	25	41	32
35	26	33	35
	21	40	34
		45	26

Test whether there is any significant difference in the mean yield of wheat due to difference in fertilizer application.

[Given $F_{0.05, (3, 13)} = 3.41$]

4 + 6

(b) (i) The results of a survey to know the educational attainment among 100 persons, randomly selected in a locality, are given below :

	Secondary School	High School	College	Total
Male	10	15	25	50
Female	25	10	15	50
Total	35	25	40	100

Can it be said that the level of education depends upon sex ? Test at $\alpha = 0.05$

[Given $\chi^2_{0.05, 2} = 5.99$].

(Turn Over)

(*ii*) Two salesman *A* and *B* are working in a certain district. From a sample survey conducted by the Head Office, the following results were obtained. State whether there is any significant difference in the average sales between the two salesman.

	Salesman A	Salesman B
No. of Sales	20	18
Average Sales (in Rs.)	170	205
Standard Deviation (in Rs.)	20	25

[Given $t_{0.01,\ 36} = 2 \cdot 423$; $t_{0.005,36} = 2 \cdot 704$].

5 + 5

[*Internal Assessment* — 10 Marks]