**2018**

**M. Com.**
**2nd Semester Examination**
Advance Business Statistics
**PAPER – COM – 202**

*Full Marks : 50*

*Time : 2 Hours*

**Use separate sheet for each Unit**

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

*UNIT – I*

**1. Answer any two questions of the following:          5 X 2**

(a) What is the importance and necessity of Sampling.

(b) Write a short note on Sampling & Non-sampling errors.

(c) Discuss the importance of Binomial Distribution. If the probability of defective items is 0.1, find the Mean and SD for the distribution of defective items in a total sample of 500.

(d) Mention the important properties of Binomial Distribution. Suppose a manufacturer's produce 2% defective per unit of product inspected. Using Poissol Distribution calculate the probability of finding a product without any defective, 3 defects. (given $e^{-2}=0.135$)

**2. Answer any one questions of the following:          10 X 1**

a) i) A sample of 3 items is selected at random from a box containing 12 items of which 3 are defectives. Find the possible number of defective combinations of the said 3 items along with probability of a defective combination.

ii) Discuss the causes of BIAS

iii) Mention the properties of Normal Distribution.          4+3+3

*(Turn over)*

b) i) 15000 students appeared for an examination the mean marks were 49 and the SD was 6. Assuming the marks distributed normally, what population of students scored more than 55 marks?

ii) 8 Coins thrown simultaneously. Find the chance of obtaining at least 6 heads, no heads & all heads.          5+5

*UNIT – II*

**3. Answer any two questions of the following:          5 X 2**

a) Define the point estimation and state the criteria for good estimators.

b) A random sample of 100 ball-bearings selected from a shipment of 2000 ball-bearings, which has an average diameter of 0.354 inch with a SD = 0.48 inch. Find the 95% confidence interval for the average diameter of those 2000 ball-bearing.

c) What do you understand by critical region and Type-I error?

d) State the procedure by which a null – hypothesis is rejected or accepted in a test of hypothesis.

**4. Answer any one questions of the following:          10 X 1**

a) Use the Kruskal-Wallis test at 5% level of significance to test the null hypothesis that a professional bowler performs equally well with the four bowling balls, given the following results :

|  | Bowling results in Five Games | | | | |
|---|---|---|---|---|---|
| With Ball No.A | 271 | 282 | 257 | 248 | 262 |
| With Ball No.B | 252 | 275 | 302 | 268 | 276 |
| With Ball No.C | 260 | 255 | 239 | 246 | 266 |
| With Ball No.D | 279 | 242 | 297 | 270 | 258 |

b) i) In a survey of 200 boys of which 75 were intelligent, 40 had skilled father; while 85 of the unintelligent boys had unskilled father. Do these figures support the hypothesis that the skilled fathers have intelligent boys use Chi Square $\chi^2$ test. Value of Chi Square $\chi^2$ for 1d.f. at 5% level is 3.84.

ii) State briefly the uses of Chi Square distribution.          7+5

*(Internal Assessment :10 marks)*