**2019**

**M. Com.**

**2nd Semester Examination**

**ADVANCE BUSINESS STATISTICS**

**PAPER – COM – 202**

***Full Marks : 50***

***Time : 2 Hours***

***The figures in the right-hand margin indicate full marks.***

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

***UNIT – I***

**1. Answer any two of the following questions. 2x2**

a) Distinguish between Statistics and Parameter with examples.
b) In a Poisson Distribution, the probability of zero success is 15 %. Find its mean and standard deviation.
c) Mention the important properties of Normal Distribution.
d) If the probability of defective item is 0.1, find the mean and S.D. for the distribution of defective items in a total sample of 500 items.

**2. Answer any two of the following questions. 4x2**

a) In a Binomial Distribution with 6 independent trials, the probability of 3 and 4 success are found to be 0.2457 and 0.0819 respectively. Find the p&q of the Binomial Distribution.
b) Explain the important properties of Poisson Distribution.
c) The incidence of a certain disease is such that on the average 20% of worker suffer from it. If 10 workers are selected at random, find the probability that – exactly 2 workers suffers and not more than 2 workers suffer from the disease.

***(Turn Over)***

d) Assume the Mean Height of soldier to be 68.22 inch with a variance of 10.8 inch. How many soldiers in a regiment of 1000 would you expect is over 6 feet tall?

**3. Answer any one of the following questions. 8x1**

a) (i) What is the difference between Sample and a Census and why sampling is so important for a Researcher.

(ii) What is an error? Differentiate between Sampling and Non-sampling error. 4+1+3

b) (i) 8 coins thrown simultaneously. Find the chance of obtaining at least 6 heads, no heads & all heads.

(ii) a sample of 3 items selected at random from a box containing 12 items of which 3 are defective. Find the possible no of defective combination of the said items along with the probability of a defective combination.

***UNIT – II***

**4. Answer any two of the following questions. 2x2**

a) What is internal estimation?
b) State any two assumptions in the analysis of variance.
c) Distinguish between Type I Error and Type II error.
d) Discuss briefly the importance of critical region.

**5. Answer any two of the following questions. 4x2**

a) Explain the concept of statistical significance.
b) A production manager wishes to conduct an experiment to compute two methods of assembling a certain mechanism. He first pairs the workers according to age and assigns the method to the workers at random. A sampleof 12 pairs of workers give the following data about the mean number of units assembled per hour:

**Continued**…..



| Pairs | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Method A | 20 | 18 | 28 | 32 | 30 | 35 | 40 | 22 | 36 | 39 | 42 | 27 |
| Method B | 22 | 14 | 30 | 35 | 31 | 36 | 40 | 18 | 35 | 8 | 40 | 20 |

Use sign test to determine at 5% livel of significance whether method A is superior to method B.

c) A sample of 600 bolts is taken from a large consignment and 75 are found to be defective.Estimate the percentage of defective in the consignment and assign limits within which the percentage lies.
d) In a large city A, 20% of a random sample of 900 school children had defective eyesight. In another large city B, 15% of a random sample of 1600 children had the same defect. Is this difference between the two proportions significant?

**6. Answer any one of the following questions. 8x1**

a) i) Distinguish between a null hypothesis and an alternative hypothesis. Use an example to explain the nature of null and alternative hypothesis in case of one and two tailed test.
ii) Distinguish between parametric and non-parametric methods for testing of statistical hypothesis. Describe any two non-parametric tests along with the situations of their use. 4+4
b) i) 5 identical coins are tossed 320 times and the number of heads appearing each time is recorded. The results are :

| Nos of Heads | 0 | 1 | 2 | 3 | 4 | 5 | Total |
|---|---|---|---|---|---|---|---|
| Frequency | 14 | 45 | 80 | 112 | 61 | 8 | 320 |

Would you conclude that the coins are biased? (Given $\chi^2$ 0.05=11.07 and $\chi^2$ 0.01=15.09 for 5 d.f. )
ii) What do you mean by "goodness of fit"? 6+2

**(*Internal Assessment: 10 marks*)**