Seat No: _____ **Enrollment No: _____**

PARUL UNIVERSITY
FACULTY OF MANAGEMENT
BBA Summer 2022 - 23 Examination

Semester:4 **Date: 16/03/2023**
Subject Code: 06191256 **Time: 10.30am to 1.00pm**
Subject Name: Business Statistics-II **Total Marks: 60**

Instructions
1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1 Do as Directed.

A) Multiple choice type questions. (Each of 1 mark) **(05)**

1. The total number of samples of size 2 from the population of 6,9,11,10 with replacement is ___.

a) 8 **c)** 16
b) 24 **d)** 32

2. Total area under normal curve is _____.

a) 0 **c)** -1
b) 1 **d)** infinity

3. A Population characteristics under study is called _____.

a) Parameter **c)** Strata
b) Statistics **d)** Estimation

4. The value of chi square is calculated by the formula _____

a) $\chi^2 = \sum \frac{(O_i - e_i)^2}{O_i}$ **c)** $\chi^2 = \sum \frac{(O_i - e_i)}{e_i}$

b) $\chi^2 = \sum \frac{(O_i - e_i)}{O_i}$ **d)** $\chi^2 = \sum \frac{(O_i - e_i)^2}{e_i}$

5. If we are interested in testing the hypothesis that the population variance are equal, then we can apply _____ test

a) t-test **c)** F- test
b) Z-test **d)** χ^2- test

B) Define the following. **(05)**

1. Sampling
2. type-I error
3. Chi square test
4. Null Hypothesis
5. Stratified Random Sampling

C) Direct questions. **(05)**

1. What is the aim of sampling?
2. What is the mean and variance of a standard normal variate?
3. What do you mean by statistical hypothesis?
4. When a sample is called small sample?
5. Write any two uses of chi square test?

Q.2 Answer the following questions.

A) **1.** Differentiate between population study and sample study **(03)**
2. What is a random sample? Explain different methods of taking a random sample. **(04)**

B) **1.** The average height of a group of soldiers is 68.22" and the variance of height is 10.89. Out of 1000 soldiers how many soldiers do you expect to be at least 6 feet tall? **(04)**

[Area between 0 and 1.5 is 0.3749]

2. The mean and standard deviation of 500 students in an examination are 52 and 8 respectively. If the marks are normally distributed, find the number of students failing in the examination if the standard of passing is of 36 marks. [Area to the left of Z=2 is 0.4772] **(04)**

Q.3 Answer the following questions.

A) 1. A random sample 400 items gave mean 4.45 and variance 4. Can the sample be regarded as drawn from a normal population with mean 4? [Table value = 1.96] **(03)**

2. A machine is designed to produce insulating washers for electric devices of average thickness of 0.025 cm. A random sample of 10 washers was found to have an average thickness of 0.024cm with a standard deviation of 0.02 cm. Test the significance of the deviation. [Table value = 2.26] **(04)**

B) 1. Two horses A and B were tested for running a particular track. The time (sec) taken by them are given below: **(04)**

Horse A	28	30	32	33	33	29	34
Horse B	29	30	30	24	27	29	

Can it be concluded that horse A is faster than horse B.[Table value = 1.796]

2. The number of road accidents on a high way during a week is given below. Can it be concluded that the proportion of accidents are equal for all days.[Table value = 12.59] **(04)**

Day	Mon.	Tue.	Wed.	Thurs.	Fri.	Sat.	Sun.
Number of accidents	14	16	8	12	11	9	14

Q.4 Attempt any two questions. (Each of 7.5 mark) **(15)**

1. The following samples are drawn from two normal populations. Test the hypothesis that the population variances are equal. [Table Value= 4.53]

Sample I	8	10	14	10	13		
Sample II	12	15	11	16	14	14	16

2. For studying characteristics the observations of a population are 10, 12, 20, 22 and 26. How many samples of size 2, without replacement can be taken from it? Preparing a list of all the samples verify the following results:

$(i) E(\bar{y}) = \bar{Y}$

$(ii) V(\bar{y}) = (\frac{N-n}{N}).\frac{S^2}{n}$

$(iii) E(s^2) = S^2$

3. (i) Differentiate between Large Sample test and small sample test.

(ii) The average life of 150 electric bulb of a company A is 1400 hours with a S.D. of 120 hours while the average life of 200 electric bulb of company B is 1200 hours with a S.D. of 80 hours. Is the difference between the average lives of the bulbs significant?

[Table Value=1.96]

4. The average weight of 1000 boys of a college is 52 kg. and its standard deviation is 3 kg. Assuming the weight to be normally distributed, find the number of boys with weight

(i) Between 48 and 53 kg. (ii) Exactly 56 kg.

$[P(0 \le Z \le 1.5) = 0.4332, P(0 \le Z \le 1.17) = 0.3790, P(0 \le Z \le 0.5) = 0.1915]$