UKA TARSADIA UNIVERSITY

B.Pharm. (II Semester)

030020205 - Biostatistics

Duration: 3 Hours **Max. Marks: 70.**

Instructions:

1. Attempt all questions.
2. Write each section in a separate answer book.
3. Make suitable assumptions wherever necessary.
4. Figures to the right indicate full marks.
5. Draw diagrams/figures whenever necessary

Section-I

Q-1 (A) Do as directed: **[07]**

I. Define Alternative hypothesis?
II. Give an example of sample
III. What is the main difference between diagram and graph?
IV. Find sample mean of 25, 36, 30, 28, 40, 20, 34, 32, 35.
V. What is non-parametric test?
VI. Define Chi-square test.
VII. What is Data?

Q-1 (B) Answer the following in brief: (Any 4) **[08]**

I. What is the difference between sample and population?
II. Explain one dimensional bar and pie diagram.
III. Write advantage of non parametric test.
IV. Two drugs are tested; the data of testing are given below.

Drug A:	18	20	36	50	49	36	34	49	41
Drug B:	29	28	26	35	30	44	46	-	-

Examine the significance of difference between the average of this two drugs.

V. 10 oil tins are taken at random from an automatic filling machine. The mean weight of the tins is 14.5 kg and standard deviation is 0.50 kg. Does the sample mean differ significantly from the intended weight of 15 kg?
VI. Explain one tail and two tail test.

Q-2 Answer the following: **[10]**

[A] In a random sample of 500 persons from Maharashtra, 200 are found to be consumer of vegetable oil. In another sample of 400 persons from Gujarat, 200 are found to be consumer of vegetable oil. Discuss whether the data reveal a significant difference between Maharashtra and Gujarat so far as production of vegetable oil consumer is concerned,

OR

[A] In a sample of 10 observations sum of squared deviations of items from the mean was 130. In another sample of 8 observations, the value was found to be 100. Test whether the different in standard deviation is significant at 5% level of significance.

[B] Explain Stratified random sampling and systematic sampling with example.

OR

[B] A die is suspected of being biased. It is rolled 24 times with the following result. Conduct a significance test to see if the die is biased.

Outcomes	1	2	3	4	5	6
Frequency	8	4	1	8	3	0

Q-3 Answer the following in detail. (Any 2) **[10]**

[A] A pharmaceutical firm maintains that the mean time for a drug to show its effect is 24 minutes. In a sample of 400 trials, the mean time is found to be 26 minutes with a standard deviation of 4 minutes. Test the hypothesis that the meantime is 24 minutes against is it not equal to 26 minutes.

[B] Explain Sampling distribution and sampling error with example.
[C] Explain Rules for constructing diagram with various examples.

Section-II

Q-4 (A) Do as directed: [07]

I. In question of correlation the value of r is 0.917 and probable error is 0.034, what is the value of number of pair observation?
II. If the regression coefficients $b_{yx} = 1.5$ and $b_{xy} = -0.6$ then what will be the value of correlation coefficient?
III. What is experimental design?
IV. What is type one error?
V. Write any one advantageous of R-chart.
VI. What is positive correlation?
VII. What is ANOVA?

Q-4 (B) Answer the following in brief: (Any 4) [08]

I. The correlation of coefficient between two variables x and y is 0.6. If their means are 16 and 20 and variance are 36 and 64 respectively. Obtain two regression equations.
II. Karl Pearson's coefficient of correlation between two variables X and Y is 0.52, their covariance is 7.8. If the variance of X is 16. Find the standard deviation of Y**.**
III. What is replicate design?
IV. What is the difference between one way ANOVA and two way ANOVA?
V. Explain advantageous of C chart.
VI. What is simple, partial and multiple correlations?

Q-5 Answer the following: [10]

[A] Following are the scores of the ten students in a class out of 150. Find correlation coefficient between them by rank correlation method.

Maths	35	40	25	55	85	90	65	55	45	50
Gujarati	100	100	110	140	150	130	100	120	140	110

OR

[A] Explain Different type of experimental design in clinical research with example. The table shown below contains the data from a hypothetical experiment with four groups of subjects each. Apply one way ANOVA and test significance of the four groups.

G1	G2	G3	G4
4	4	4	6
2	5	5	7
3	4	4	7
3	6.5	7	8

OR

[B] From the data given below find both the regression line

X(Drugs unit)	5	7	6	9	11	23	24	12
Y(Improvement)	2	4	5	6	7	8	4	4

Q-6 Answer the following in detail. (Any 2) [10]

[A] What is sigma chart? Explain advantageous and limitation of statistical quality control.
[B] The following table gives the aptitude test scores and pharmaceutical productivity indices of 10 workers selected at random:

Aptitude scores:	60	62	65	70	72	48	53	73	65	82
Productivity index:	68	60	62	80	85	40	52	62	60	81

Estimate the productivity index of worker whose test score is 92.
[C] Explain merits and demerits of Two-way cross over, three way cross over design and Replicate design.