

**M. SC. (MEDICAL BIOTECHNOLOGY) SEM-III (CHOICE  
BASED CREDIT SYSTEM) : WINTER - 2017  
SUBJECT : BIOSTATISTICS**

Day : **Monday**  
Date : **13/11/2017**

Time : **10.00 AM TO 01.00 PM**  
Max. Marks : **60**

**W-2017-1058**

**N.B.:**

- 1) **Q.No.1 and Q.No.5 are COMPULSORY.** Out of the remaining questions attempt **ANY TWO** questions from each section.
- 2) Answers to both the sections should be written in **SEPARATE** answer books.
- 3) Figures to the right indicate **FULL** marks.

**SECTION – I**

- Q.1 a)** Identify continuous variables, ordinal variables and nominal variables from: **[02]**
- i) Body temperature of a patient
  - ii) PH value of a liquid food
  - iii) Color of skin
  - iv) Thickness of skin as {very-thick, moderately thick, thin and very-thin}

- b)** Find mean, mode and median of body-weight (kg) of children from a children's ward. Observations: **[05]**

30	30	32	31	35	30	30	29	31	32
34	33	32	33	32	32	33	32	30	34

- c)** Draw a histogram of data in (B) above. **[03]**

- Q.2** Explain the following concepts in brief: **[10]**

- a) Pie chart
- b) Level of significance
- c) Range
- d) Scatter diagram
- e) Growth curve

- Q.3** What are the different ways of sampling? Describe at least one method in detail considering a specific case of instance for illustrations. **[10]**

- Q.4** Complete the following sentences and rewrite: **[10]**

- a) If Max = 36, and range is 23, value of Min is \_\_\_\_\_.
- b) Value of correlation coefficient can never be greater than \_\_\_\_\_.
- c) If value of standard deviation = 25, n = 16, value of standard error is \_\_\_\_\_.
- d) If Mean Y = 5, slope = 1.0, Mean X = 2.0, value of intercept is \_\_\_\_\_.
- e) If Cov (X, Y) = 3.4 and Var (X) = 1.7, value of slope = \_\_\_\_\_.
- f) Mean of a binomial distribution is \_\_\_\_\_, if n = 35 and p = 0.2.
- g) If a variable is normally distributed then percentage of observations included in the interval (Mean – S.D., Mean + S.D.) are \_\_\_\_\_.
- h) The most common value of level of significance used in testing of hypothesis is \_\_\_\_\_.
- i) Value of statistic R-square is always less than or equal to \_\_\_\_\_.
- j) Conditional probability P(A|B) is defined as \_\_\_\_\_.

**P.T.O.**

**SECTION – II**

**Q.5** State the steps in testing of Hypothesis. Name situations in which following tests are used: [10]  
Paired test, Z-test, Chi-sq test and F-test.

**Q.6** Use Chi-sq test to test association between feedback and background, of patients, collected at a Hospital, regarding quality of services. [10]

	Good	Fair	Poor
Rural	15	20	10
Semi-Urban	12	24	20
Urban	23	18	12

Given table value of Chi-sq at 0.05 probability and 4 df is 9.487.

**Q.7** Use the following data to test the hypothesis that two sample means are same, using t-test (independent samples) [10]

	n	Mean	Variance
Sample 1	20	3.2	2.34
Sample 2	20	4.3	2.54

t-values for 38 df = 1.96, assume alpha = 0.05.

**Q.8** Write short notes on ANY TWO of the following: [10]

- a) Markov Models and Applications
- b) Fuzzy Logic
- c) Normal Probability Distribution

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