Registration No: | | | | | | | | | | |

Total Number of Pages: 02 **B. Tech.**
PBT3I103

3rd Semester Regular Examination 2017-18
BIOSTATISTICS
BRANCH: BIOTECH
Time: 3 Hours
Max Marks: 100
Q.CODE: B1168

Answer Question No.1 and 2 which are compulsory and any four from the rest.
The figures in the right hand margin indicate marks.

Q1 **Answer the following questions:*multiple type or dash fill up type*** **(2 x 10)**

a) Median, mode, deciles and percentiles are all considered as measures of
a) mathematical averages b) sample averages
c) population averages d) averages of position

b) The sum of all the deviations of the observations from the mean is _____.
a) > 0 (b) < 0 (c) 0 (d) None

c) The formula for coefficient of variation is _____.

d) Tickets numbered 1 to 20 are mixed up and then a ticket is drawn at random. What is the probability that the ticket drawn has a number which is a multiple of 3 or 5?
(a) 1/2 (b) 2/5 (c) 8/15 (d) 9/20

e) The lower and upper quartiles of a symmetrical distribution are 40 and 60 respectively. The value of median is:
(a) 40 (b) 50 (c) 60 (d) (60 – 40) / 2

f) In a lottery, there are 10 prizes and 25 blanks. A lottery is drawn at random. What is the probability of getting a prize?
(a) 1/10 (b) 2/5 (c) 2/7 (d) 5/7

g) Both the regression coefficients b_{xy} and b_{yx} should be of _____
(a) same sign (b) opposite sign (c) none

h) If the values of mean, median and mode coincide in a unimodel distribution, then the distribution will be:
(a) Skewed to the left (b) Skewed to the right
(c) Multimodal (d) Symmetrical

i) Any measure indicating the centre of a set of data, arranged in an increasing or decreasing order of magnitude, is called a measure of:
a) Skewness b) Symmetry c) Central tendency d) Dispersion

j) The model letter of the word “STATISTICS” is:
(a) S (b) T (c) Both S and I (d) Both S and T

Q2 **Answer the following questions: *Short answer type*** **(2 x 10)**

a) Define hypothesis testing.
b) Write three types of probability distribution.
c) Define the term sample space.
d) What is quartile deviation?
e) What is co-efficient of variation?
f) Define the term normal distribution.
g) Define mutually exclusive events.
h) What is a dependent event?
i) What is continuous random variable?
j) Define kurtosis.

Q3 **a)** Differentiate between correlation and regression. In a partially destroyed lab record, only the lines of regression of y an x and x on y are available as 3x + 2y = 26 and 6x + y = 31 respectively. Calculate $\bar{x}$, $\bar{y}$ and coefficient of correlation between x and y. **(10)**

b) What are the four measures of dispersion? Which is the most widely used measure of dispersion and why? Explain with an example. **(5)**

Q4 **a)** The following table shows the ages [X] and systolic blood pressure [Y] of 8 persons: **(10)**

Age (X)	56	42	60	50	54	49	39	45
Blood Pressure (Y)	160	130	125	135	145	115	140	120

Calculate the correlation coefficient (r).

b) Describe about the concept of variables in biological system. **(5)**

Q5 **a)** Calculate the Karl Pearson's coefficient for following data using 20 as working mean for price and 70 as working mean for demand. **(10)**

Price	14	16	17	18	19	20	21	22	23
Demand	84	78	70	73	66	67	62	58	60

b) Define simple random sample. Explain simple random sampling without replacement with suitable example. **(5)**

Q6 **a)** Define Mean, Median and Mode and give their relationship. Give suitable examples. **(10)**

As a part of the classic experiment on mutations, ten aliquots of identical sizes were taken from the same culture of the bacterium *E. coli.* For each aliquot, the number of bacteria resistant to a certain virus was determined. The result were as follows:

14, 15, 13, 21, 15, 14, 26, 16, 20 and 13. Evaluate all the measures of central tendency.

b) Explain the addition and multiplication theorems of probability with appropriate examples. **(5)**

Q7 **a)** What do you understand by probability? Describe briefly with an example. **(10)**

The probability that a student A solves a biology-related problem is 2/5 and the probability that a student B solves it is 2/3. What is the probability that the problem is not solved, when they are working independently?

b) Explain the method of preparing histogram and frequency polygon. **(5)**

Q8 **a)** Define standard deviation and give it's formulae. Calculate the standard deviation for the following frequency distribution of workers in a factory. **(10)**

Wages	15	20	24	28	30	32	34	38
No. of workers	25	47	53	90	75	95	30	25

b) In a shipment of 20 computers 3 are defective. Three computers are randomly selected and tested. What is the probability that all three are defective, if the first and second are not replaced after being tested? **(5)**

Q9 **a)** What is classification? Explain different basis of classification with suitable examples. **(10)**

b) Explain random block design and split plot design. **(5)**