MASTER OF SCIENCE (BIOINFORMATICS) (CBCS-2019 COURSE)
M. Sc. (Bioinformatics) Sem-I : WINTER :- 2021
SUBJECT: BIOSTATISTICS

Day : Monday | Time : 10:00 AM-11:30 AM
Date 31-01-2022 | **W-21150-2021** | Max. Marks: 30

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Both sections should be written in the **SAME** answer book.
4) Nonprogrammable calculator is **ALLOWED**.

SECTION-I

Q.1 Solve any **FIVE** of the following: **(05)**

a) The volume of blood in a syringe drawn from patient's body is 3ml. Sometime it is drawn from right arm, some time left arm. Would you consider this as a fair sample? What would be the population in this case?

b) If a random variable takes values {-1, 0, +1} with probabilities {0.2, 0.6, 0.2} what is its expected value?

c) If $y = 3\ e^{2x}$ is a growth model for a certain organism in a favorable growth culture, predict the value of y at $x = 3$ and $x = 5$.

d) State the typical equation for polynomial model of degree 5. How many coefficients are there in the equation?

e) Membership value of x in Fuzzy set A is 0.3. What is its membership value in A^c.

f) Name at least two measures of dispersion.

Q.2 Solve any **TWO** of the following: **(10)**

a) Discuss the concept of Linear Regression analysis, process and its significance in scientific investigation.

b) State the generic steps in testing of hypothesis and criteria for rejection of an hypothesis. When do you use the term 'two-tailed' or 'one-tailed' in this context?

c) Explain the concepts Markov Property and Markov Random field.

P.T.O.

SECTION-II

Q.3 Fill in the blanks (any **FIVE**): **(05)**

a) Normal distribution is also called _____ distribution.

b) F, t, and CHI-square are called _____ distributions.

c) ANOVA is an abbreviation for _____.

d) In the linear model $y = a + bx$ the coefficient b is called _____.

e) If there are 4 rows and 5 columns in a contingency table, the degrees of freedom for chi-sq test is _____.

f) $y = 3\ x^{2.1}$ is called a _____ model.

Q.4 Solve any **TWO** of the following: **(10)**

a) Write a note on ANOVA.

b) Use a labeled diagram to illustrate the concept of Back propagation in the context of ANN.

c) Use the following probability values to draw a Transition diagram. Discuss the implications.

States	S1	S2	S3
S1	0.9	0.0	0.1
S2	0.15	0.8	0.05
S3	0.75	0.25	0.0

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