

ADVANCED DIPLOMA IN BIOINFORMATICS (A.D.B.) (CBCS-2019 COURSE)
A.D.B. SEM-I : WINTER :- 2021
SUBJECT: BIOSTATISTICS

Day : Monday
Date 31-01-2022

W-21123-2021

Time : 10:00 AM-11:30 AM
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) $y = 3x^{2.1}$ 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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