B.Sc. Part-I (Semester-I) Examination

BIOINFORMATICS

(Elementary Mathematics & Statistics)

Time : Three Hours] [Maximum Marks : 80

Note :— (1) Attempt **ALL** questions.

(2) Question No. **1** is compulsory.

1. (A) Fill in the blanks : 2

(i) Definite integral of any function is _____.

(ii) f''(x) is called as _____.

(iii) Median divides the series in _____ equal parts.

(iv) Upper limit of probability is _____.

(B) Choose the correct alternatives and rewrite the sentences : 2

(i) f'(x) is called as :

(a) Function of X (b) Derivative of X

(c) Second order derivative (d) Integral of X

(ii) Order of differential equation $\frac{d^2y}{dx^2}+\frac{dy}{dx}=0$ is :

(a) Zero (b) One

(c) Two (d) None of the above

(iii) Deciles divide the series in _____ equal parts.

(a) Two (b) Four

(c) Ten (d) Hundred

(iv) A die is rolled, then probability of getting number 5 is :

(a) $\frac{1}{2}$ (b) 1

(c) $\frac{1}{6}$ (d) Zero

(C) Answer the following in **ONE** sentence : 4

(i) Define definite integral.

(ii) Order of the differential equation.

(iii) Meaning of mode.

(iv) What do you mean by dispersion ?

2. (a) Explain the difference and product of two functions. 4

(b) Discuss procedure of obtaining integration of function. 4

(c) Solve the differential equation :

$$3\frac{d^2y}{dx^2} + 2\frac{dy}{dx} + \sin x = 0.$$ 4

OR

(p) How would you obtain limit of function ? Give example. 4

(q) Explain derivative of trigonometric function. 4

(r) Discuss about implicit function. 4

3. (a) Explain the integration by substitution. 4

(b) How would you obtain a function from derivative ? 4

(c) Explain procedure of obtaining volume of bounded region. 4

OR

(p) Define difference equation with example. 4

(q) Discuss procedure for integration by partial function. 4

(r) Explain how would you obtain difference and product of two functions. 4

4. (a) Discuss the concept of order and degree of differential equation. 4

(b) Explain the variable separable method. 4

(c) Solve the differential equation : $y = 2e^x p + e^x Q + R$ eliminating P, Q and R. 4

OR

(p) Explain the procedure of obtaining solution of first degree differential equation. 4

(q) What are the types of the differential equations ? Give example. 4

(r) Obtain the solution of $3\sin x\frac{dy}{dx} + 2\sin x = \cos 2x$. 4

5. (a) Define central tendency. What are its measures and define arithmetic mean for grouped data ? 6

(b) Obtain the first and third quartile for following data :

Marks	10 — 20	20 — 30	30 — 40	40 — 50	50 — 60	60 — 70
No. of Students	5	12	15	11	8	3

6

OR

(p) Explain concept of correlation, scatter diagram and correlation coefficient. 6

(q) Obtain correlation coefficient for following data :

X	2	8	9	11	13	16	17
Y	6	10	12	14	18	22	26

6

(Contd.)

6. (a) Define sample space and events. 4

(b) What are the axioms of probability ? 4

(c) Obtain probability of getting sum 10, when two dice are rolled simultaneously. 4

OR

(p) Explain mutually exclusive and independent events. 4

(q) State the Baye's rule of probability. 4

(r) Discuss concept of probability tree. 4

7. (a) What do you mean by random variable ? Explain, with example, discrete and continuous random variable. 6

(b) Obtain the expected value of x for following : 6

x	2	3	4	5	6	7
p(x)	0.1	0.2	0.2	0.3	0.15	0.05

OR

(p) Explain the cumulative distribution function. Give its properties. 6

(q) Describe probability mass function and probability density function. 6