

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 :

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

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 :

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

6

OR

- (p) Explain the cumulative distribution function. Give its properties. 6
 (q) Describe probability mass function and probability density function. 6

