AU–36

B.Sc. (Part–I) Semester–I Examination

1S : BIOINFORMATICS

(Elementary Mathematics and Statistics)

Time : Three Hours] [Maximum Marks : 80

N.B. :– (1) Attempt all questions.

(2) Question No. 1 is compulsory.

1. (A) Fill in the blanks :

(i) f'(x) called as _____.

(ii) The order of differential equation is _____.

(iii) Median also called as _____.

(iv) p is called probability of _____. 2

(B) Choose correct alternative and rewrite the sentence :

(i) Definite integral of any function is :

(a) Absolute (b) Unique

(c) Constant (d) None of above

(ii) Order of differential equation $\frac{d^3y}{dx^2} + \frac{dy}{dx} = 0$ is :

(a) One (b) Two

(c) Three (d) None of above

(iii) Quartiles divide the series in _____ equal parts :

(a) Two (b) Four

(c) Ten (d) Five

(iv) Two coins are tossed, then probability of getting two heads is :

(a) ¼ (b) ½

(c) 1 (d) Zero 2

(C) Answer the following in **one** sentence :

(i) Define indefinite integral

(ii) Classify the differential equation

$$\left(\frac{d^2y}{dx^2}\right)^2 + \frac{dy}{dx} + 3y = x^2$$

(iii) Standard deviation is denoted by ?

(iv) What do you mean by mode ? 4

2. (a) Explain finite and infinite integrals. 4

(b) Discuss how you would obtain maximum value of function. 4

(c) Solve following differential equation

$$\frac{d^2y}{dx_2^2} + 2\frac{dy}{dx} + \cos x = 0$$ 4

OR

(p) Explain the limit function with example. 4

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

(r) How would you obtain integration of function ? 4

3. (a) Define difference equation with example. 4

(b) Explain the procedure for integration by partial fraction. 4

(c) How would you obtain the area of bounded region ? 4

OR

(p) Discuss about integration by substitution. 4

(q) A wire of length 3 cm is to form a rectangle. Find the dimension of rectangle so that it has maximum area. 4

(r) Explain integration by partial fraction. 4

4. (a) Define differential equation. Give its types. 4

(b) Obtain the solution of differential equation :

$$Y = e^{3x} P + e^{2x} Q + R$$

by eliminating P, Q and R. 4

(c) Explain the variable separable method. 4

OR

(p) Explain the order and degree of differential equation. 4

(q) How would you obtain general solution of second degree differential equation ? 4

(r) Solve the differential equation :

$$2\cos x \frac{dy}{dx} + 3y \sin x = \sin 3x$$ 4

5. (a) Obtain the histogram and frequency polygon for following data :

Marks	30–40	40–50	50–60	60–70	70–80
No. of Students	8	13	26	15	9

6

(b) Obtain correlation coefficient for following data :

X	3	11	14	12	18	19	22
Y	10	12	16	11	15	20	13

6

OR

(p) Obtain mean and median for following data :

Marks	20–30	30–40	40–50	50–60	60–70	70–80
No. of Students	13	24	29	20	17	10

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(q) Obtain the linear regression line of Y on X for following data :

X	6	7	8	9	10	11	12
Y	22	28	32	40	45	48	51

6

6. (a) Define experimental probability. Give example. 4

(b) State and prove addition law of probability. 4

(c) Obtain the probability of getting sum less than Eight in rolling two dice. 4

OR

(p) Define independent event and conditional probability. 4

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

(r) Obtain the probability of getting at least two heads, when three coins are tossed. 4

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

(b) Obtain probability mass function of getting number of heads, when two coins are tossed. 6

OR

(p) Define probability density function. Explain how would you obtain expectation of continuous random variable. 6

(q) Obtain probability mass function of getting sum of outcome when two dice are rolled. 6