AT – 289

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

1S–BIOINFORMATICS

(Elementary Mathematics and Statistics))

P. Pages : 6

Time : Three Hours] [Max. Marks : 80

Note : (1) Attempt all questions.
(2) Question No. **One** is compulsory.

1. (a) Fill in the blanks :—

(i) Limit of function is ————.

(ii) Degree of differential equation : $\frac{d^2y}{dx^2} = 3\sqrt{y+\left(\frac{dy}{dx}\right)^3}$, is ————.

(iii) Correlation coefficient is between —— ————.

(iv) Total probability of any experiment is— ————. 2

(b) Choose correct alternative and rewrite the sentence :—

(i) Indefinite integral of any function is:

(a) Unique (b) Constant

(c) Absolute (d) None of the above.

(ii) Probabilities of any event A is :—

(a) More than 1 (b) Positive

(c) Negative (d) None of the above.

(iii) Lineur regression equation has the degree:

(a) Unity (b) Two

(c) Three (d) None of the above.

(iv) Median divide the series in parts :

(a) Two equal (b) Three

(c) Four (d) None of the above. 2

(C) Answer in **One** sentence :—

(i) Limit of functions.

(ii) Difference equation of order one.

(iii) Meaning of mode.

(iv) Standard deviations is denoted by. 4

2. (a) Explain limit of function and continuity of function. 4

(b) What do you mean by differentiation of function? Give example. 4

(c) Express $\int_0^3 (2x+5)\, dx$, as a limit of sum. 4

OR

(p) Explain the differentiation of sum of functions. 4

(q) How would you obtain the derivative of exponential functions ? Give example. 4

(r) Find the absolute maximum and minimum value of the function :

$f(x) = x^3 - 15x^2 + 35x + 3,\ 0 < x < 5.$ 4

3. (a) Explain the term "Integration of function". Give example. 4

(b) Evaluate : $\int \frac{1}{\sqrt{x^2 - a}}\, dx$ 4

(c) What do you mean by integration by partial fraction. 4

OR

(p) Explain "Integration of sum and product of two functions". 4

(q) Evalute : $\int \frac{\sin x}{1+\sin x} dx$ 4

(r) How would you obtain volume of bounded region ? 4

4. (a) What do you mean by differential equation? Give example. 4

(b) Solve the following differential equation, when $y = 3$ and $x = 2$

$$y^2 + \frac{dy}{dx} = 2y - x\frac{dy}{dx}$$ 4

(c) How would you obtain gemeral solution of second order differential equation ? 4

OR

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

(q) Solve the differential equation :

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

(r) Discuss the separable variable method of differentiation. 4

5. (a) Obtain the frequency curve for following data:

x_i	4	7	9	11	14	17	20	22	25
f_i	11	13	17	19	21	25	28	33	38

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(b) Obtain the standard deviation for following:

x_i	6	7	8	9	10	11	12
f_i	9	10	12	13	11	8	7

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OR

(p) What do you mean by correlation ? Explain the types of correlation by scatter diagram. 6

(q) Obtain correlation coefficient for following data :

x	8	9	11	14	13	15	16	19
y	10	11	15	12	10	16	18	20

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6. (a) What do you mean by probability ? What are its limits ? 4

(b) Define sample space and disjoint events. 4

(c) Obtain the probability of getting red king from a pack of playing cards. 4

OR

(p) State the Baye's theorem of probability. 4

(q) Obtain the sample space and probability of getting atleast two heads when three coins are tossed simultaneously. 4

(r) Define independent events. Give example. 4

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

(b) Obtain probability mass function of random variable of getting sum of out come. when two dice are rolled. 6

OR

(p) State and prove addition law of probability. 6

(q) Define probability density function. Explain how would you obtain expection of continous random variable. 6