SUBJECT CODE: BY/PC/BB35

M. Sc. DEGREE EXAMINATION, NOVEMBER 2009
BIOTECHNOLOGY
THIRD SEMESTER

COURSE   : CORE
PAPER   : BIOPHYSICS & BIOSTATISTICS
TIME   : 3 HOURS   MAX. MARKS: 100

SECTION – A

ANSWER ALL QUESTIONS.   **10 x 2 = 20**

1. Differentiate Pyranose and Furanose.
2. Define Enthalpy.
3. What are chaperons?
4. What are the different bonds present in DNA?
5. Explain Skewness and Kurtosis
6. Find out the arithmetic mean and mode of the ungrouped data given below. : 9, 5, 13, 7, 6, 3, 5, 4, 12, 5, 7, 3, 11, 10, 5
7. Define Standard Deviation and Standard Error.
8. Explain Type I and Type II error.
9. Define ANOVA and also the techniques involved.
10. Define Null Hypothesis.

SECTION – B

ANSWER ANY FOUR QUESTIONS, EACH WITHIN 600 WORDS.   (4 x 10 = 40)

11. Explain Bragg's Law with a Diagram
12. With a diagram write a note on the structure and chemical composition of Plasma

Age	15-19	20-24	25-29	30-34	35-39	40-44	45-49	50-54	55-59
%	2.4	10.9	28.5	19.2	13.4	10.8	8.9	5.2	0.7

Membrane
13. Calculate Median for the following data

14. From a group of seven boys and four girls a team is to be selected. If there are to be six members in the team, in how many ways can the team be composed (a) if there are to be exactly two girls in the team, and (b) if there are to be at lease two girls in the team?
15. A 100 km stretch of trunk road through a forest was surveyed to determine the incidence of death of wild life due to accidents caused by heavy vehicles. The total number of dead animals counted was 75. Calculate the probability of finding no dead wild life in any randomly selected km stretch of this trunk road. What is the probability of finding one dead animal? Two dead animals?
16. From the following table test,whether son's eye colour is associated with father's eye-colour.

		Eye colour of sons	
		Not Light	Light
Eye Colour of fathers	Not Light	230	148
	Light	151	471

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SECTION – C

ANSWER ANY TWO QUESTIONS, EACH WITHIN 1500 WORDS.   (2 x 20 = 40)

17. a. Briefly explain cell as a thermodynamic unit   8 Marks
    b. Write a short note on High Energy compounds   12 Marks
18. Explain Transport across membrane in detail with a diagram
19. a. Some health researchers have reported an inverse relationship between central nervous system malformations and the hardness of water supplies. Suppose data were collected on a sample of 9 geographic areas with the following results:

CNS malformation rate (per 1000 births)	Water Hardness (ppm)
9	120
8	130
5	90
1	150
4	160
2	100
3	140
6	80
7	200

Compute co-efficient of correlation. What is your conclusion?   10 Marks

    b. The scores of the golfers A and B in 9 rounds are given below. Determine who is better player and who is the consistent player.

Player A	Player B
74	87
75	84
78	80
77	88
79	89
81	82
79	82
72	86
71	80

20. a. A normal distribution of 1000 variables has an arithmetic mean of 20 and a variance of 9. Using Normal tables, find how many variables lie in the following ranges: (i) 18 to 20; (ii) 23 to 26 and (iii) 26 to 27.5

    b. The systolic pressure of 10 persons in the age group of 45-50 is given below: 148, 128, 147, 127, 150, 145, 124, 140, 142, 149
In the light of the data, discuss the suggestion that the average systolic pressure of the population is 150.

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