

**M. Sc. DEGREE EXAMINATION, APRIL 2013**  
**BIOTECHNOLOGY**  
**SECOND SEMESTER**

**COURSE : ELECTIVE**  
**PAPER : BIOPHYSICS & BIostatISTICS**  
**TIME : 3 HOURS**

**MAX. MARKS: 100**

**SECTION – A**

**ANSWER ALL THE QUESTIONS**

**(20 x 1 = 20)**

1. Beer – Lamberts Law
2. Monochromator
3. NMR
4. I law of Thermodynamics
5. ESI
6. Active transport
7. Give examples of supra macro-molecules
8. Significance of entropy
9. Give two examples of high energy biomolecules
10. MALDI
11. Kurtosis
12. Testing of hypothesis
13. Percentile
14. Population
15. Dependent variable
16. Degree of freedom
17. Variance
18. Frequency
19. Primary data
20. Gaussian distribution

**SECTION – B**

**ANSWER ANY FOUR QUESTIONS.**

**(4x 10 = 40)**

21. Give an account on the classification and tabulation of data.
22. Explain the structure of biological membrane with suitable illustrations.
23. Give the principle and application of X-ray diffraction in studying biomolecules
24. Give an brief note on signal transduction.
25. In a pack of cards find
  - (a) the probability of selecting a jack of spade
  - (b) the probability of selecting a heart
  - (c) the probability of selecting a heart or queen
  - (d) the probability of heart or diamond king

26. Calculate mean deviation and coefficient of mean deviation

|                  |     |     |     |     |     |     |     |
|------------------|-----|-----|-----|-----|-----|-----|-----|
| Weight<br>in gms | 100 | 120 | 130 | 140 | 150 | 160 | 200 |
|------------------|-----|-----|-----|-----|-----|-----|-----|

### SECTION – C

ANSWER ANY TWO QUESTIONS

(2x 20 = 40)

27. Give the principle and application of MALDI.

28. Write a brief note on a) protein-protein interaction b) protein-ligand interaction

29. Based on information on 3248 randomly selected fields about the tenancy status of the cultivation of these fields and the use of fertilizers, collected in a agro-economic survey, the following classification was noted

|                        | Owned | Rented | Total |
|------------------------|-------|--------|-------|
| Using fertilizer       | 20    | 792    | 812   |
| Not using<br>fertilize | 220   | 2216   | 2436  |
| Total                  | 240   | 3008   | 3248  |

Would you conclude that owner cultivators are more inclined towards the use of fertilizers at 5% level? Carry out chi-square tests as per testing procedure.

30. The weights of 250 Bisons are given below.

| Weight          | 90-100 | 100-110 | 110-120 | 120-130 | 130-140 | 140-150 |
|-----------------|--------|---------|---------|---------|---------|---------|
| No of<br>Bisons | 17     | 24      | 41      | 70      | 53      | 45      |

Calculate the mean, median, standard deviation and standard error for the data.

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