# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**M.Sc.** DEGREE EXAMINATION – **BIOTECHNOLOGY**

SECOND SEMESTER – **APRIL 2015**

**BT 2824 - BIOINFORMATICS & RESEARCH METHODS**

Date : 18/04/2015          Dept. No. [          ]          Max. : 100 Marks
Time : 01:00-04:00

---

**PART –A**                                      **(20 Marks)**

**Answer all the questions**

**I.  Choose the correct answer:**                    **(5x1= 5 marks)**

1. Which among the following is not a primary storage unit?

   a.    Floppy disk          b. Hard disk                c. RAM          d. Cloud backup

2. Marker positions on chromosomes can be determined experimentally using which technique?

   a.    PFGE                          b. FISH

   b.    c. Restriction digestion        d. Chromosome walking

3. Choose the irreversible post translational modification of protein.

   a. Phosphorylation                    b. Acetylation

   c. Nitrosylation                      d. Proteolysis

4. Criteria for developing a good research problem.

   a. Sampling                    b. Magnitude

   c. Resolution                  d. All the above

5. _____ measures and analyses the degree or extent to which the two variables fluctuate with reference to each other.
   a. Regression      b. Correlation          c. Box plot            d. ANOVA

**II. State whether the following are true or false; if false give reason**

**(5x1= 5marks)**

6.  Protein Data Bank is maintained by National Institute of health.
7.  Coding statistics is not important for *ab initio* gene prediction.
8.  In homology modeling clustalW is used to identify templates.
9.  Hypothesis-testing studies portray accurately the characteristics of a particular individual or a group.
10. Spatial statistics helps better understanding of geographic phenomena.

**III. Complete the following:**                    **(5x1= 5marks)**

11. _____ was the first published genome.
12. _____ is used to mask the repetitive sequences in DNA.
13. Protein cleavage products can be obtained using _____.
14. _____ offers an overview of significant literature published on a topic.
15. MVA stands for_____.

**IV. Answer the following, each within 50 words:**          **(5x1= 5marks)**

16.  Give an example for a composite database.
17.  What are the three types of objects described in GDB?
18.  What is loop modeling?
19.  Write a note on exploratory research.
20.  Mention the different measures of dispersion.

## PART-B

**Answer the following, each within 500 words only.**                    **(5x8=40marks)**
**Draw diagrams wherever necessary.**

21.    a. Write about:
          i. PDB                ii. Genbank
                                **OR**
       b. Discuss any two data retrieval systems.
22.    a. Explain generation and preprocessing of EST data. Add a note on its uses.

                                **OR**
       b. Discuss *ab initio* gene prediction in eukaryotes.
23.    a. Explain any four tools used for prediction of physical properties of protein.
                                **OR**
       b. Discuss phosphorylation, glycosylation and the servers used to predict them.
24.    a. How would you collect and review scientific literature.
                                **OR**
       b. Explain the different types of data. Give an explanation each one of them.
25.    a. How would you write a research article for a scientific journal?
                                **OR**
       b. (i) Calculate the mean, median and mode for the following distribution of the
          ages, in year, of 120 members in a sports club.

| Age (Years)  | 18 | 21 | 25 | 30 | 40 | 45 | 48 |
|--------------|----|----|----|----|----|----|----|
| No. of people | 9  | 24 | 38 | 40 | 15 | 9  | 1  |

    (ii) Write a note on types of regression analysis.                **(3+4=7 marks)**

## PART-C

**Answer any two of the following, each within 1500 words.**        **(2x20= 40marks)**
**Draw diagrams wherever necessary.**

26.    Describe any four methods of mapping and add a note on mapping databases.
27.    Elaborate on computational protein structure prediction methods.
28.    What is a thesis? Explain in detail the components of a thesis.
29.    Mention and explain the contents of a scientific report.

                          ************