**Reg. No. \_\_\_\_\_\_\_\_**

**Karunya University**

**(Karunya Institute of Technology and Sciences)**

(Declared as Deemed to be University under Sec.3 of the UGC Act, 1956)

**Supplementary Examination - June 2011**

**Subject Title: STRUCTURAL BIOINFORMATICS Time: 3 hours**

**Subject Code: BI219 Maximum Marks: 100**

#### **Answer ALL questions**

**PART – A (10 x 1 = 10 MARKS)**

1. Give the structure of basic amino acid.

2. Why is beta glycine not possible?

3. List the methods to predict protein tertiary structure.

4. Why don’t we calculate the Ramachandran plot for proline?

5. What would happen if both phi and Psi are zero?

6. Mention the types of symmetry considered in quaternary structure of proteins.

7. What is the lifetime of a peptide bond?

8. What is Eukaryotic rRNA?

9. Why do you have polarity in peptide chain?

10. What do you mean by molecular dynamics of small molecules?

**PART – B (5 x 3 = 15 MARKS)**

11. Write single and three letter code for arginine, lysine and tryptophan.

12. What are beta sheet forming and beta sheet breaking residues?

13. Would you expect the interior of protein channel to be hydrophobic or hydrophilic? Explain.

14. Briefly discuss on three dimensional prediction methods for rRNA.

15. Give an account on protein – small molecule interactions.

**PART – C (5 x 15 = 75 MARKS)**

16. Elaborate on techniques used for structure determination of proteins.

(OR)

17. Write notes on: a. Structure of PDB data entries b. Atomic Co-ordinates (7.5+7.5)

18. What are domains and motifs? Explain different structural motifs in proteins.

(OR)

19. a. Compare and contrast the types of DNA with illustrations. (10)

b. Differentiate between parallel and antiparallel beta sheets. (5)

20. Explain Ab initio methods for structure prediction.

(OR)

21. Give an account on: (7.5+7.5)

a) Comparative Protein Modeling b) Methods for prediction of protein secondary structures.

22. Discuss in detail about three dimensional structure determination methods for nucleic acids.

(OR)

23. Discuss on the methods for comparison of three dimensional structures of proteins.

24. Give a detailed account on Protein – Protein and Protein DNA interactions

(OR)

25. Describe the Molecular Mechanics of Proteins and Nucleotides.