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End Semester Examination of Semester-II, 2016

Subject : BOTANY (PG)

Paper : BOTPG-201

(Biophysics and Biochemistry)

Full Marks : 40

Time : 2 Hrs

The figures in the margin indicate the marks corresponding to the question.

Candidates are requested to give their answers in their own word as far as practicable.

Illustrate the answers wherever necessary.

Answer all questions

1. Answer any seven of the following questions: $2 \times 7 = 14$
 - a) What are the methods of determination of 3D structure of a protein?
 - b) Mention the function of molecular chaperons.
 - c) Write the symptoms of the deficiency of Vitamin K.
 - d) Name two sulphur containing amino acids.
 - e) What does it mean by feedback inhibition of enzymes?
 - f) What are the cofactors for (i) Pyruvate Carboxylase and (ii) Superoxide dismutase?
 - g) Define buffer mentioning its use in biological system.

(2)

- h) What is Van-der-Walls interaction?
- i) How does α -oxidation differ from β -oxidation?
- j) Define isoenzyme and cite an example.
- k) Distinguish between indole and non indole alkalids.
- l) What are PUFA and MUFA?
2. Answer any two of the followings: 5x2=10
- a) What are the secondary and quaternary structures of proteins? Delineate the non-covalent interactions that stabilizes the protein structures.
- b) What is vitamin? Classify water soluble vitamins and discuss their biochemical functions? 1+2+2
- c) Justify the equation $V_0 = \frac{V_{max} [S]}{K_m + [S]}$ with required figure.
- d) Enumerate the major properties of lipids. Write down the differences between saturated and unsaturated fatty acids with an example of each. 2+3
3. Answer any two of the followings: 8x2=16
- a) i) What is an atom? Discuss about the components of atom.
- ii) What is enzyme Kinetics? Give an outline of its classification. (2+2)+(1+3)

(3)

b) Differentiate nucleotide and nucleoside. Mention the structures of purines and pyrimidines with their chemical name. Distinguish B and Z DNA.

2+4+2

c) Discuss the characteristic features of active site of enzyme. Mention with energy profile diagram how enzyme accelerate reactions. Write the equation of Lineweaver-Burk plot and explain the parameters. How do you calculate the K_m from the Lineweaver-Burk plot?

3+2+2+1

d) What is α amino acid? Cite two examples to each of acidic, basic and non-polar amino acids. What is isoelectric point of an amino acid? Calculate the isoelectric point of alanine (pK_1 and pK_2 values 2.3 & 9.9)

1+3+1+3
