M.Sc. 3rd Semester Examination, 2010

BOTANY

PAPER—XIII

Full Marks : 40

Time : 2 hours

The figures in the right-hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

Illustrate the answers wherever necessary

UNIT—I

[*Marks* : 20]

1. Answer any *five* of the following : 1 × 5

(*a*) Write down the full form of CCC.

(*b*) Name the ions responsible for photolysis of water in photosynthesis.

(*c*) Name two scavenging enzymes of photorespiratory pathway.

(*d*) What is the chemical nature of kinetin ?

(*e*) What is meant by 'orthodox seeds' ?

(*f*) Cite examples of two day-neutral plants.

(*g*) What is nif gene ?

(*h*) Name two chemical agents for breaking seed dormancy.

2. Write short notes on any *two* : $2\frac{1}{2} \times 2$

(*i*) Dual function of Rubisco

(*ii*) Critical day length

(*iii*) Innate and induced dormancy of seeds

(*iv*) Symbiotic nitrogen fixation.

3. Answer any *one* of the following :

(*a*) What is meant by phytochrome ? Give their chemical nature and role in flower initiation. How the two forms of phytochrome regulate the flowering mechanism ? 2 + 3 + 5

(*b*) (*i*) "Stoichiometry of C3 is 1:2:3 while that of C4 is 1:2:5." Justify the statement.

(*ii*) 'C4 pathway is a biochemical evolution.' Justify. 5 + 5

UNIT – II

[*Marks* : 20]

4. Answer any *five* of the following : 1 × 5

(*a*) Why an amino acid functions as a 'Zwitterion' ?

(*b*) Name two aromatic amino acids.

(*c*) What do you mean by 'Chirality' of a carbon compound ?

(*d*) What is meant by 'quaternary structure' of protein ?

(*e*) What are prosthetic groups and cofactors ?

(*f*) Differentiate fat from oil.

(*g*) What are the components of a cellobiose molecule ?

(*h*) Write down the full form of FPLC.

5. Write short notes on any *two* of the following : $2\frac{1}{2} \times 2$

(*i*) Secondary structure of protein.

(*ii*) Significance of 'peptide bond' to limit the range of 3-D conformations of a polypeptide chain.

(*iii*) Tay-Sachs disease

(*iv*) Feedback inhibition.

6. Answer any *one* of the following :

(*a*) What is meant by 'mutarotation' ? How an -o-glycosidic bond is formed between two monosaccharides ? Give the structure of a storage polysaccharide and a structural polysaccharide found in plants. 2 + 2 + 6

(*b*) What is meant by triacylglycerols ? Discuss the steps of fatty acid oxidation reactions. How many ATP molecules will be generated after complete oxidation of a Myristic acid (a saturated fatty acid of 14 'C') ? 2 + 6 + 2