

Exam. Code : 103205

Subject Code : 1347

B.A./B.Sc. 5th Semester

BOTANY

Paper—V (B)

(Biochemistry and Biotechnology)

Time Allowed—3 Hours]

[Maximum Marks—35

Note :— There are total of **NINE** questions. Question No. 1 will be compulsory and is of short answer-type (3-4 lines). The remaining **EIGHT** questions have been set from equal distribution of syllabus out of which candidates are required to attempt **FOUR** questions. All questions (including Q. No. 1) have equal marks i.e. 7 marks each.

1. (a) What are the four characteristics of an enzyme ?
- (b) What are the similarities and differences between aerobic and anaerobic respiration ?
- (c) What is the difference between ammonification and nitrogen fixation ?
- (d) Where do fatty acids synthesis occurs ?
- (e) What is the difference between genomic library and cDNA library ?

- (f) Which dietary source of energy contains the most energy per gram (kcal/g) ?
- (g) Difference between cellular differentiation and morphogenesis. 1×7
2. (a) How do cofactors and coenzymes affect enzyme activity ? Give examples.
- (b) What is the process of the electron transport chain ? Give schematic representation. Is it aerobic or anaerobic ? 3+4
3. (a) Explain pentose phosphate pathway. How many ATP are produced in Chemiosmosis ?
- (b) Describe the process of biological nitrogen fixation with the help of diagram. 3+4
4. Describe the steps involved in nodule development in a legume root. What is the importance of nitrate reductase enzyme ? 4+3
5. (a) Briefly explain beta-oxidation. Where does it take place ?
- (b) Discuss apoenzyme and allosteric enzymes with examples. 3+4
6. (a) What are transposable elements ? Give some examples.
- (b) Illustrate the basic aspects of plant tissue culture. 3+4

7. (a) What are the different techniques of gene mapping ?
- (b) Describe salient achievements in the field of cellular biotechnology. 3+4
8. Describe tools and techniques of recombinant DNA technology. What are its applications ? 4+3
9. (a) Define vectors for gene delivery in *Agrobacterium* and its applications.
- (b) Where are fatty acids stored and how they are transported ? Explain the process in details. 3+4