

Seat No. : \_\_\_\_\_

**LH-120**

**April-2014**

**B.Sc. Sem.-VI**

**Elective-311 : Biochemistry**

**(Applied Biotechnology)**

**Time : 3 Hours]**

**[Max. Marks : 70**

1. (a) Discuss immobilized enzyme in detail with reference to different types, properties, advantages and disadvantages. **11**

(b) Draw a labeled schematic diagram of Biosensors. **3**

**OR**

(a) Discuss enzyme reactors in detail. **12**

(b) What is enzyme engineering ? **2**

2. Explain any **two** : **14**

(1) Advantages of Probiotics

(2) GM foods

(3) Single cell proteins

(4) Use of enzymes in food industries

3. (a) What is gene therapy ? Discuss two types of gene therapy and steps involved . **9**

(b) Write a note on DNA probes. **5**

**OR**

(a) List advantages and disadvantages of DNA vaccines.

(b) Discuss subunit vaccines with example.

4. (a) What is phytoremediation ? Explain use of phytoremediation in treatment of organic contaminants. 7
- (b) What are biofertilizers ? Discuss their status, advantages and limitations. 7

**OR**

- (a) Define Xenobiotics. List various hazards occurring due to Xenobiotics. 6
- (b) Write a note on hydrocarbon degradation. 8

5. Answer the following : (14)
- (1) Write two applications of immobilized enzyme. 2
- (2) Name the enzyme used in artificial kidney. 1
- (3) Define GM foods. 1
- (4) Name any two GM crops. 1
- (5) What is the use of single cell proteins ? 2
- (6) Name any two vectors used in gene therapy. 1
- (7) What is tissue engineering ? 1
- (8) Name any two DNA markers used in disease diagnosis. 2
- (9) Name any two recalcitrant types of xenobiotics. 1
- (10) Define bioremediation.
- (11) Name two micro organisms used in degradation of long chain alkene compounds. 1
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**April-2014**

**B.Sc. Sem.-VI**

**Elective-311 : Biochemistry**

**(Plant Biochemistry)**

**Time : 3 Hours]**

**[Max. Marks : 70**

1. Write in detail about plant cell wall structure and its function. **14**

**OR**

(i) Describe the vascular tissues of plant system. **7**

(ii) Write a note on cells involved in formation of structural tissues. **7**

2. (i) Give an account on various pigments necessary for photosynthesis. **7**

(ii) Explain cyclic photophosphorylation. **7**

**OR**

Explain Non-cyclic photophosphorylation in detail. Draw a flow chart to show those reactions that are common in cyclic and non-cyclic photophosphorylation. **14**

3. (i) Explain sucrose synthesis in plants and its inter-conversion to starch. **7**

(ii) Describe the phosphate uptake mechanisms in plants. **7**

**OR**

Give an account on nitrogen fixation and assimilation in plants. **14**

4. Explain the movements, physiological effect, and biochemical mode of action of auxins. **14**

**OR**

Describe the biosynthetic roles of cytokines, ethylene, and gibberlins.

5. Each question carries **1** mark.

**14**

State **true or false** and correct if the statement is false :

- (a) Blue light is more energetic than red light in photosynthesis.
- (b) Since chlorophylls absorb green light, plant appears green in colour.
- (c) In photosynthesis, oxygen from water is incorporated into glucose.
- (d) Electrons from oxygen are used to reduce NADP + to NADPH in non cyclic electron flow.

**Fill in the blanks :**

- (e) Auxins are synthesized in \_\_\_\_\_ tissues.
- (f) Lateral movement of auxins occurs in response to \_\_\_\_\_.
- (g) Cytokines were discovered by \_\_\_\_\_.
- (h) A plant hormone in stomatal closure in response to water stress is \_\_\_\_\_.
- (i) An enzyme needed for assimilating ammonia into organic nitrogen is \_\_\_\_\_.
- (j) A polysaccharide other than cellulose, present in plant cell wall is \_\_\_\_\_.

**Answer briefly :**

- (k) What are CAM plants ?
  - (l) What is chemiosmotic hypothesis ?
  - (m) What is the role of abscisic acid in plant ?
  - (n) Draw a plant cell and label.
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**LH-120**

**April-2014**

**B.Sc. Sem.-VI**

**Elective-311 : Biochemistry  
(Endocrinology)**

**Time : 3 Hours]**

**[Max. Marks : 70**

1. How hormones are different than enzymes and vitamins ? Explain by giving characteristics of hormones. **14**

**OR**

Write a note on any **one** of the following :

- (a) Role of hormones as secondary messenger.  
(b) Types of glands (with location in human) and hormones of each gland.

2. Write a note on any **two** of the following : **14**

- (a) Explain regulation of thyroxin secretion.  
(b) Give compare and contrast of hyper and hypo thyroidism.  
(c) Effect of hormones on calcium homeostasis.

3. Explain effect of glucagon on liver and muscles in detail. **14**

**OR**

Explain any **one** of the following :

- (a) Give location of gland and its internal structure of insulin producing gland.  
(b) Disorder due to insulin hormone in human.

4. Write any **two** of the following : **14**

- (a) Discuss anatomy and hormones produce by kidney associated endocrine gland.  
(b) Functions associated with male sex hormones.  
(c) Difference between adrenaline and nor-adrenalin.  
(d) Effects of progesterone and estrogen.

5. Name the gland produces following hormone and one function of each hormone.  
TSH, GTH, FSH, ACTH, LH, T4, PTH, TSHRH **14**

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**B.Sc. Sem.-VI**

**Elective-311 : Biochemistry**

**(Recombinant DNA Technology)**

**Time : 3 Hours]**

**[Max. Marks : 70**

1. (a) Write a note on M13 phage and its advantage as a cloning vector. 7  
(b) Write the steps involved in the preparation of total cell DNA from a bacterial cell. 7

**OR**

- (a) Discuss the methods for putting sticky ends on the blunt ended molecules. 7  
(b) Discuss the methods for the identification of recombinants in Transformation. 7

2. (a) Explain the Chain Termination method of DNA sequencing. 7  
(b) Write a note on Polymerase chain reaction. 7

**OR**

- (a) Write a note on methods for clone identification. 10  
(b) Write a note on Southern Blotting technique. 4

3. (a) Write a note on YACs. 7  
(b) Mention the significance of promoter and different types of promoters used in expression vectors. 7

**OR**

- (a) Discuss problems with the production of recombinant protein in E.coli. 7  
(b) Discuss in vitro mutagenesis. 7

4. Write short notes on any **two** : 14  
(a) Production of Recombinant Vaccines.  
(b) Production of Recombinant Insulin.  
(c) Gene therapy.

5. Write any **Seven (7)** :

**14**

- (1) List different types of DNA manipulative enzymes.
  - (2) What is cDNA library ?
  - (3) What is DNA foot printing ?
  - (4) Define Cosmids and Phagemids.
  - (5) Classification of Plasmids.
  - (6) Draw and label  $\lambda$  Genetic Map.
  - (7) How can one check the purity of DNA preparation ?
  - (8) Draw the map of pBR322 vector.
  - (9) What are Cassette Vector ?
  - (10) Explain Insertional Inactivation.
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