Seat No. : _____

AG-134

April-2015

B.Sc., Sem.-VI

BIC-311 : Biochemistry (A)
Applied Biotechnology

Time : 3 Hours] **[Max. Marks : 70**

Instructions : (1) **All** questions carry equal marks.

(2) Draw diagram wherever required.

1. Discuss : Enzyme reactors in details. **14**

OR

Explain biosensors in details with a diagram.

2. Write a note on the following : **14**

(1) Advantages of Probiotics.

(2) Production of single cell proteins.

OR

Discuss the following :

(1) Importance of GM foods.

(2) Use of enzymes in food industries.

3. Explain the following : (any **two**) **14**

(1) DNA finger printing

(2) Approaches for gene therapy

(3) Sub-unit vaccines

(4) DNA vaccines

(5) Tissue engineering

4. (a) What are Biofertilizers ? List different types of biofertilizers and discuss PSB biofertilizers. **8**

(b) Explain B. thurengenesis as a biocontrol agent. **6**

OR

(a) Explain : In-situ & Ex-situ bioremediation. State their advantages & disadvantages. **7**

(b) Write a note on : Xenobiotics degradation. **7**

5. Answer the following : **14**

(1) What is enzyme engineering ? Give an example. **2**

(2) Define immobilized enzyme with an example. **2**

(3) Name any two microbial strain used as Probiotics. **2**

(4) State two concern over GM food. **2**

(5) Define : (1) DNA probe (2) Peptide vaccine **2**

(6) What is single nucleotide polymorphism ? **1**

(7) Define recalcitrant and give an example. **2**

(8) What is Phytoremideation ? **1**

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B.Sc., Sem.-VI

SEC-311 : Biochemistry (B)

Plant Biochemistry

Time : 3 Hours] **[Max. Marks : 70**

1. Explain plant cell wall formation and its functions. **14**

OR

Write in detail on plant cell organelles.

2. (a) Explain non-cyclic photophosphorylation. **8**

(b) Explain C4 metabolism in plants. **6**

OR

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

(b) Explain Calvin's cycle. **7**

3. (a) Write a detailed note on nitrogen fixation and assimilation. **9**

(b) Write a note on sucrose synthesis and breakdown. **5**

OR

(a) Write in detail on phosphate assimilation and its role in plant cells. **7**

(b) Write a note on sulphate assimilation. **7**

4. (a) Write a note on Auxins, , its biosynthesis, transport, signal transduction and downstream effect. **14**

OR

(a) Write a note on Gibberelins, its biosynthesis, transport, signal transduction and downstream effect.

5. Answer the following : **14**

(1) The enzyme nitrogenase is extremely sensitive to _____.

(2) Sucrose-phosphate is an intermediate in sucrose synthesis. True/False.

(3) Conversion of fats in to sugar in plants occurs in

(a) Peroxisomes (b) Glyoxisomes (c) Golgi-bodies (d) Iysosomes

(4) The secondary cell wall found in certain cell types is formed inside the primary cell wall after the cell is fully grown and is composed of lignin. True/False.

(5) What are schlerenchyma cells and in which plant tissue are they found ?

(6) Photosynthesis maintains equilibrium of which gas/es in atmosphere.

(7) Ubiquinone is an electron carrier in photosynthesis. True/False.

(8) How many molecules of NADPH and ATP are required for fixation of 1 CO_2 molecule in C4-pathway ?

(9) How many carboxylation reactions occur in C4 pathway ?

(10) The true natural auxin of higher plants is

(a) indole-3-acetic acid

(b) indole-3- pyruvic acid

(c) indole-3-acetaldehyde

(d) indole-3-acetonitrile

(11) Concentration of which of hormones increases in senescence of plants ?

(12) Fruit ripening hormone is _____.

(13) Which is the precursor for cytokinin synthesis ?

(14) _____ polysaccharide is the most abundant organic source on earth.

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April-2015

B.Sc., Sem.-VI

Paper-311 : Elective Endocrinology (C)

Time : 3 Hours] **[Max. Marks : 70**

1. (a) Define – hormones and give its important characteristics. **7**

   (b) Name important glands, its locations and its hormones in human. **7**

   OR

   Write note on the following :

   (a) How hormones carry out its mode of effect. **7**

   (b) Effect of hormone at membrane level. **7**

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

   (a) Explain synthesis of T_3 and T_4

   (b) Hyper Thyroidism

   (c) Effects of Parathyroid hormones

   (d) Hormones balancing calcium level in blood.

3. Explain role of glucagon or insulin on carbohydrate metabolism. **14**

   OR

   Explain any **one** of the following :

   (a) Structure and function of hormone causes diabetes.

   (b) Hyper glycemia and hypo glycemia.

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

(a) Explain adrenal hormones – Important in emergency.

(b) Hormones secreted by ovary as gland.

(c) Role of anti-adrenaline against adrenaline.

(d) Male sex hormones and its effect.

5. Write the full form of the following and mention **one effect** of each : **14**

TSH, GTH, ACTH, LH, PTH, PIF, TSHRH

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April-2015

B.Sc., Sem.-VI

BIC-311 : Biochemistry (D)

Voc BT (SEC) : Recombinant DNA Technology

Time : 3 Hours] **[Max. Marks : 70**

1. (a) Draw a diagram showing the methodology of gene cloning and highlight the importance of each step. **7**

   (b) What are the different methods of introducing DNA into living cells ? **7**

OR

   (a) Write a detailed note on plasmids justifying their suitability as cloning vehicles. Give examples. **9**

   (b) What are restriction endonucleases ? Explain why they are used as molecular scissors. **5**

2. (a) How does one identify a clone of a specific gene by :

   (i) Direct Selection

   (ii) Hybridization **7**

   (b) Write in detail on polymerase chain reaction. **7**

OR

   (a) Write in detail on Southern Hybridization and its application. **6**

   (b) Write in detail on DNA sequencing. **8**

3. (a) What are expression vectors ? What would be the specifications required in an expression vector for use in *E.coli* ? **7**

   (b) Write in detail on cloning vectors for yeast. **7**

OR

   (a) What is (i) DNA foot printing, (ii) Deletion analysis and (iii) S1 nuclease analysis ? **9**

   (b) Explain site directed mutagenesis and its use in studying protein function. **5**

4. (a) Explain how insulin is produced in vitro. **8**

(b) Write in detail on production of factor VIII using gene cloning. **6**

OR

(a) Write in detail on applications of gene cloning. **10**

(b) What is gene therapy ? **4**

5. Answer in short : **14**

(1) What is a cosmid ?

(2) Give two characteristics of M13 that makes it a good cloning vector.

(3) What are linkers ?

(4) What is the role of alkaline phosphatase as a tool in gene cloning ?

(5) Why is phenol – chloroform used in DNA isolation from bacteria ?

(6) How does ethidum bromide help in plasmid DNA isolation ?

(7) Give one advantage of cDNA probes.

(8) List three methods of labelling DNA probes.

(9) What is FISH ? And give its use.

(10) What do you understand by heterologous probing ?

(11) What do you understand by codon bias ?

(12) How are P elements used in recombinant DNA technology ?

(13) What is the application of yeast 2 hybrid method ?

(14) What do you understand by molecular pharming ?

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