M.Sc.

2015

4th Semester Examination

BIOTECHNOLOGY

PAPER—BIT-401

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

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

Illustrate the answers wherever necessary.

Special Paper

(Pharmaceutical Biotechnology)

Group — A

Answer any *five* questions from the following : 2×5

1. (a) Name the major components of growth media for mammalian cell culture.

(b) What precautions should be taken to use a Protein drug as oral therapeutic agent ?

(c) State the role of interferon–α.

(d) What are Protein inclusion bodies ?

(e) What do you mean by recombinant therapeutic proteins ?

(f) What is Perfusion chromatography ?

(g) What are the approaches that can be used to enhance the solubility of therapeutic proteins ?

(h) What do you mean by Pharmacodynamics of Protein drugs ?

Group — B

Answer any *two* questions from the following : 2×

2. (a) Briefly discuss the steps involved in isolation and purification of recombinant proteins.

(b) Describe the chemical structure of insulin and add a note on physical stability of insulin formulation. 3+2

(c) What are excipients ? List the excipients and mention their uses in parental formulation of biotech products. 1+4

(d) Where are interferon produced? Give a chemical description of different commercially available interferons. 1+4

Group — C

Answer any *two* questions from the following : 2×10

3. (a) Describe briefly the approval and investigational uses of G-CSF, GM-CSF and EPO in different clinical disorders involving different types of blood cells.

(b) Discuss in detail the major elimination pathways for protein drugs after administration.

(c) (i) Briefly discuss about different antibody based targeting system of protein drugs.

(ii) Give an idea about chemical modification of protein therapeutics. 5+5

(d) How pharmacogenomics is important for individualized medicine? Explain with an example. 7+3

Special Paper

(Agriculture Biotechnology)

Group — A

Answer any *five* questions from the following : 2×5

1. (a) What do you mean by AmA1 gene ? In which crop it has been introduced transgenically ?

   (b) Name two biopharmaceuticals compound and mention their use.

   (c) What is green diesel ? Mention its source.

   (d) What is "recalcitrant xenobiotics" ? Give two example.

   (e) What is elicitor ? Cite two examples.

   (f) What is the need for genetic manipulation of a fruit ?

   (g) What do you mean by V-GURTs and T-GURTs ?

   (h) Name two lignolytic enzyme producing fungi.

Group — B

Answer any *two* questions from the following : 5×2

2. (a) What do you mean by somaclonal, protoclonal and gametoclonal variations ? Give one example of each of disease resistant, salt tolerance, metal tolerance

and herbicide tolerance plant obtained from somaclones. 2+3

(b) Explain with suitable example how bioactive peptides, and vaccines produced in plants. $2\frac{1}{2}+2\frac{1}{2}$

(c) Describe briefly the transgenic breeding and marker assisted breeding approach for crop improvement. Which approach is more suitable to produce monogenic trait controlled characters? 4+1

(d) Describe briefly the approaches of biocontrol of bacterial diseases in plants. 5

Group — C

Answer any *two* questions from the following : 10×2

3. (a) What do you mean by polygenic trait? Explain how modern wheat has been developed by increasing chromosome number? 2+8

(b) Explain the techniques employed to increase the amount of secondary metabolites in plants by tissue culture approach with examples. Describe a bioreactor system for mass cultivation of plant cells. 6+4

(c) Write the advantges and disadvantages of lignin degradation by fungal enzyme. Discuss different

biotechnologica approaches for weed control in plants. 4+6

(d) Write notes on: 5×2

(i) IPR.

(ii) Micropropagation of forest trees.

Special Paper

(Food Biotechnology)

Group — A

Answer any *five* questions from the following : 2×5

1. (a) Mention the principles of food preservation.

(b) State the advantages of biofortification of food.

(c) State the differences between parboiled rice and Raw rice.

(d) What do you mean by "Emulsifiers" ? Give example.

(e) What are the purposes of using stabilizers in foods ? Write the names of a few stabilizers.

(f) What is "edible films" ? State two applications of it.

(g) What is space food ?

(h) State the objects of food packaging.

Group — B

Answer any *two* questions from the following : 2×5

2. Enlist the physical methods related with food preservation and elaborate any one. 5

3. What do you mean by enzymatic and non enzymatic browning of foods ? State its impact on food. 4+1

4. What is meant by classification in fruit juice preparation ? What preservatives are added in fruit juie ? 3+2

5. List some principle factors influencing destruction of microorganisms by Irradiation. What are post-mortem changes of meat ? 3+2

Group — C

Answer any *two* questions from the following : 10×2

6. What do you mean by "food adulterants" ? Enlist the different kinds of adulterants in detail. "lyophilisation

keeps the protein active" — Justify. 2+4+4

7. Differentiate between boiling and pasteurization. Is sterilization applied in case of milk and milk products? Justify your answer with proper explanation. Discuss different types of pasteurization processes. Phosphatase test is important in dairy industry — Justify.

$2+\frac{1}{2}+1+4+2\frac{1}{2}$

8. What is thermal death time? State the significance of thermal death time curve. Discuss how various factors in food can influence the heat resistance of contaminating microbes. 2+3+5

9. Write notes on: 5+5

   (i) Neutraceuticals.

   (ii) Food fads.