M.Sc.

2015

4th Semester Examination

BIOTECHNOLOGY

PAPER—BIT-402

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

(Medical Biotechnology)

Group — A

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

1. (a) What is JAK-STAT signalling pathway for GH action ?

(b) What is the benefit of PEGylated molecule ?

(c) Why Edward Jenner and Louis Pasteur are famous ?

(d) What is live attenuated vaccine ? Give example.

(e) What is a chimeric antibodies ? How it is applicable ?

(f) What are the differences between the storage procedures of protein and DNA materials ? Justify your answer.

(g) What are antibody mimetics ? How it will be therapeutically potential ?

(h) What is the concept of personalized medicine ? How it may be helpful in therapeutics ?

Group — B

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

2. Briefly describe the procedure of γhGH production with a suitable diagram.

3. What are excipients ? Why they are used in vaccine preparations ? Mention the name of some excipients with there specific uses.

4. Describe the role of 'tau' protein and β-amyloid plaque in Alzheimer's disease. What are the clinical manifestation of this disease ?

5. What is a DNA vaccine ? How plants may be used as a bioreactors for vaccine production ?

Group — C

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

6. Explain the molecular basis of human multiple sclerosis ? What is its autoimune components for disease pathogenesis ? What are the clinical manifestation of this disease.

7. (a) What are the ethical issues of handling individuals for any epidemiological or related studies ?

(b) In which situation RTI act may not be applicable ?

(c) How body mass index may be applicable for diagnosis of a metabolic disorder in human ? 3+3+4

8. Write a short note on different recombinant clotting factors. How the haemophilia can be treated with some of these factors ? 8+2

9. (a) Describe in brief about the production, formulation and storage of different types of vaccine ?

(b) Cancer is a compex disease: What does it mean ? 5+5

Special Paper

(Aquaculture Biotechnology)

Group — A

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

1. (a) What is cryopreservation ?

   (b) Define blue revolution.

   (c) What is the role of a reporter gene ?

   (d) State the symptoms of black gill diseases of tiger prawn.

   (e) What is column feeder ?

   (f) Briefly state the role of seed oyster.

   (g) Name two protozoan parasites of fish.

   (h) What are the consequence of algal blooms ?

Group — B

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

2. (a) Why vitamins are important for nutrition ? What are PUFAs ? 4+1

(b) How spawning is carried out in common carp ? What is sex reversal ? 4+1

(c) Give an account of larval stages of shrimp with diagram (not more than three). 5

(d) Write a brief account on National planning for development of aquaculture. 5

Group — C

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

3. (a) Prepare a note on Pre-stocking management of pond. Write short notes:

i) Tank farm.

ii) Fishery Cooperative. $5+2\times2\frac{1}{2}$

(b) How integrated health management helps in maintaining good fish health ? What is genetic resistance to disease ? Write the utility of fish vaccination. 5+2+3

(c) State the significance of cloning with an example. What are the considerations to be taken for the selection of an appropriate promoter ? State the utility of sperm binding in fish transgenesis. What is LTR in a viral vector ? 3+4+2+1

(d) What is live fish feed ? Differentiate between live and artificial fish feed. Add a note on feed additives.

2+4+4

Special Paper

(Bioprocess Technology)

Group — A

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

1. (a) What is Numberg's fermentation ?

(b) What do you mean by dual fermentation ?

(c) What is the difference between yield and yield coefficient ?

(d) What is biotransformation ? Explain with example.

(e) State the difference between feedback inhibition and feedback repression ?

(f) What are the critical factors for isolating Actinomycetes from soil ?

(g) State the working principle of photobioreactor.

(h) Describe the principle of affinity chromatography.

Group — B

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

2. (a) What are the various designs and working principles of airlift bioreactors ? Give example of two bioreactors where these bioreactors are used and justify their selection for these bioprocesses. 2+3

(b) Briefly describe the methods adopted to recover industrially important enzyme secreted by microorganism. What do you mean by up stream processing ? 4+1

(c) How will you obtain an intracellular compound from a microbial fermented broth ? What are the criteria for selection a new material in industrial level production ? 2+3

(d) Describe different techniques of whole microbial cell immobilisation. 5

Group — C

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

3. (a) What do you mean by strain improvement ? Discuss any two techniques for improving commercially important strains. 2+4+4

(b) How will you recover a volatile compound after microbial fermentation ? Describe different types of centrifugation that are used in industrial fermentations. 3+7

(c) Write various techniques for separation of solid matter from microbial fermented broth. With a flow diagram describe different steps of product recovery upto marketing. 3+7

(d) Write notes on: 5+5

(i) Membrane bioreactor.

(ii) "Curd is a milk product, but it has more nutritious value than milk." — Justify.
