2015

P.G. Diploma Examination in Quality Control and Assurance in Microbial Technology

1st Semester Examination

PAPER—QUA-102

Full Marks : 50

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.

Answer any *Five* Questions from each Group.

Group—A

[*Marks : 25*]

Answer any *five* questions.

1. (a) Write down the different post fermentation processes for ensuring purity / quality, activity and stability in the produced protein for the satisfaction of the end users (consumers).

(b) What kind of protein are generally produced in solid state fermentation ?

(c What is the main difference(s) between the solid state fermentation and submerged fermentation ?

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

2. (a) What kind of micro-organisms are used for amino acid production in industries ?

(b) What are the major control factors during industrial production of glutamic acid ?

2+3

3. (a) How do you produce penicillin in the industry ? Does its production method differ from the production of Semisynthetic penicillins in the industry ? — Discuss.

(b) Highlight the role of precursor during penicillin production.

(c) Which of the following penicillins is stable in gastric acid and suitable for oral administration :

(i) methicillin ;
(ii) carbenicillin ;
(iii) closacillin ;
(iv) penicillin-G.

$(2+1\frac{1}{2})+1+\frac{1}{2}$

4. (a) Write down the exact substrate(s) used for the following industrial production :

(i) Larger beer ;
(ii) wine vinegar ;
(iii) white wine ;
(iv) Bacterial amylase.

(b) Describe (briefly) the application of either of the following products : $(\frac{1}{2} \times 4)+3$

(i) Lipases ;

(ii) Invertase.

5. (a) What do you mean by fed-batch mode of fermentation ? How does it differ from continuous mode of fermentation ?

(b) How do you sterilize and regulate the pH of the media for the large scale production of industrial ethanol using yeast ?

(1+1)+3

6. Briefly describe industrial production of ethanol. 5

7. Write short note on (any *two*) : $2 \times 2\frac{1}{2}$

(a) Industrial strain improvement ;

(b) Bubble column bioreaction ;

(c) Fed batch culture.

8. Write the health beneficial effect of fermented foods. State the industrial applications of LAB. 2+3

Group—B

[*Marks : 25*]

Answer any *five* questions.

1. (a) What are stem cells ?

(b) Mention their sources and applications. 1+(2+2)

2. (a) What is meant by 2-D gel electrophoresis ?

   (b) Briefly state its principle and uses. 1+(2+2)

3. (a) What are monoclonal antibiotics made up of ?

   (b) Illustrate two important applications of monoclonal antibodies. 1+(2+2)

4. In respect of recombinant DNA technology, illustrate (with diagram) :

   (a) the difference between genomic clone and cDNA clone ; *and*

   (b) their production schemes, in short. 1+(2+2)

5. Define gene silencing and describe the different ways of gene silencing. 1+4

6. What is a cloning vector ? Why are they necessary ? Name two vectors those are widely used in microbial technology. 1+3+1

7. Name two biopolymers. Are all biopolymers biodegradable ? What are the advantages of biopolymers in environmental sustainability ? 5

8. Describe the different ways of sewage treatment. 5
