

ISC SEMESTER 2 EXAMINATION
SPECIMEN QUESTION PAPER
BIOTECHNOLOGY PAPER 1
(THEORY)

Maximum Marks: 35

Time allowed: One and a half hour

Candidates are allowed an additional 10 minutes for only reading the paper.

They must NOT start writing during this time.

Answer all questions in Section A, Section B and Section C.

The intended marks for questions or parts of questions are given in brackets.[]

SECTION A – 7 MARKS

Question 1

- (i) When plant cells without cell wall are used for culturing, it is called _____ culture. [1]
- (ii) The phase of microbial growth kinetics in which there is no increase in the cell number but the cellular mass increases to some extent, is called _____ phase. [1]
- (iii) Write the full form of each of the following:
- (a) EST [1]
- (b) STS [1]
- (iv) Which of the following important enzymes are used in disaggregation of animal cells? [1]
- (a) Trypsin and collagenase
- (b) Tyrosine and collagenase
- (c) Trypsin and collagen
- (d) Tyrosine and collagen

- (v) If the cells show stationary growth phases which are either G1 or G2 phases, what are the cells called? [1]
- (a) Starved at G1 and G2 phases
 - (b) Inhibited at G1 and G2 phases
 - (c) Arrested at G1 and G2 phases
 - (d) Cold treated at G1 and G2 phases
- (vi) **Assertion:** Seedless watermelon can be produced by using culture technology. [1]
Reason: Seedless fruits can be produced by culturing endosperm which is triploid in nature.
- (a) Assertion and reason are true and reason is correct explanation for assertion.
 - (b) Assertion and reason are true but reason is not the correct explanation for assertion.
 - (c) Assertion is true but reason is false.
 - (d) Both assertion and reason are false.

SECTION B – 16 MARKS

Answer the following questions briefly.

Question 2 [2]

Name and briefly explain the method used to sterilize vitamins that are used in preparing culture medium.

Question 3 [2]

- (i) Discuss *any two* applications of microbial culture technology.

OR

- (ii) Discuss *any two* applications of animal cell culture technology.

Question 4 [2]

Give *one* difference between each of the following:

- (i) Chemostat and thermostat
- (ii) Batch culture and continuous culture

Question 5 [2]

What is the difference between *macronutrients* and *micronutrients*? Explain the importance of each of the two.

Question 6 [2]

Give *any two* disadvantages of enzymatic disaggregation.

Question 7 [2]

Briefly explain *androgenesis*.

Question 8 [2]

Write the full form of each of the following and mention their importance.

(i) BLAST

(ii) FASTA

Question 9 [2]

What is *bioinformatics*? Mention *any one* significance of bioinformatics.

SECTION C – 12 MARKS

Question 10

Study *Figure 1* carefully and answer the questions that follow:

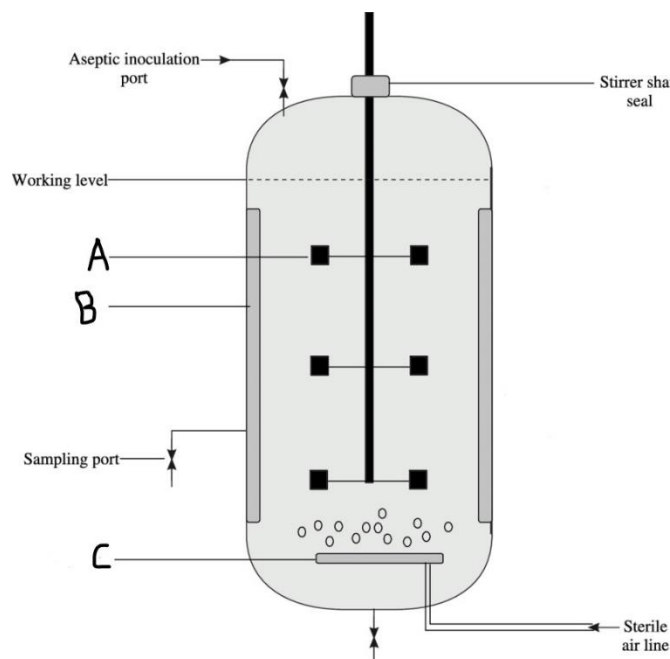


Figure 1

(i) Identify the parts labelled “A”, “B” and “C”. [1½]

(ii) Mention the role of the labelled parts “A”, “B” and “C” in the fermenter. [1½]

Question 11 [3]

Read the passage given below and answer the questions that follow:

Based on the cell culture technology, some researchers performed an experiment. They used the direct counting method to count the number of cells and tested their viability followed by the culturing process.

(i) Name the device used for the direct counting method.

(ii) Which method would have been used to check the viability of cells? Briefly explain its process.

(iii) Name the culture medium they might have used to culture the plant cell.

Question 12 [3]

Discuss the components of a proper culture medium for plant culture.

OR

Discuss the types of culture media used to culture the microbes.

Question 13 [3]

Discuss *any three* major objectives of *HGP*.