



SEAT No. _____

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Sardar Patel University

[4]

B.Sc On demand Semester examination-2022

B.Sc IV Semester

Subject – Biotechnology

Course no. US04CBIT02

Date - 4.10.2022

Applications of Biotechnology

Time – 2hrs(12.30 to 2.30PM)

Marks-70

NOTE- Figure in the right indicates marks.

All questions are compulsory. Make necessary diagram wherever needed.

Q.1. Multiple Choice Question (MCQ). Select correct answer from given MCQ. (10marks)

1.a. The ratio of phenotypes in F₂ of a Dihybrid cross is-

- (A) 3:1 (B) 1:2:1
(C) 9:3:3:1 (D) 2:1

1.b. Mendel selected Pea as material for his experiments because

- (A) It is an annual plant with comparatively short life cycle
(B) The flowers are self-pollinated
(C) The number of seeds produced is quite large
(D) All the above

1.c. Ratio 3:1 is due to-

- (A) Duplicate genes (B) Lethal genes
(C) Monohybrid cross (D) Dihybrid cross

1.d. A large number of cells or molecules which are originally identical to their parental ancestral cell are called

- (A) Clone (B) Cloning
(C) Homology (D) All of these

1.e. Recombinant clones are identified through

- (A) Insertional inactivation (B) Insertional activation
(C) Deletion inactivation (D) Deletion activation

1.f. Which of the following substances are required for preparation of competent cell

- (A) FeCl (B) NaCl
(C) CaCl₂ (D) CuCl₂

1.g. For raising haploid plants

- (A) Only the petals are cultured (B) Only the anthers are cultured
(C) Whole stamens are cultured (D) Entire flower is cultured

1.h. Somatic embryogenesis is a procedure in plant tissue culture methodology described best as

- (A) Formation of both shoot and root meristem
(B) Formation of stable embryos
(C) Formation of axillary buds
(D) Formation of anthers

1.i. Protoplast fusion can be promoted by

- (A) Ficoll (B) Polyethylene glycol
(C) High voltage x-rays (D) Tritone X-100

1.j Homokaryones are formed by fusion of

- (A) Two similar cytoplasts (B) Two similar protoplasts
(C) One protoplast and one cytoplast (D) Two dissimilar protoplasts

P.T.O

Q2. Fill in the blanks/true false

(08marks)

- a. Most common medium used for plant tissue culture are-----.
- b. ----- can be used for fusion of protoplast.
- c. Normal animal cell shows the property of ----- inhibition.
- d. Transfer of DNA into vector to construct new combination of DNA are also called-----.
- e. Synthetic seeds are encapsulated seed -True/False
- f. Meristem culture is not suitable for obtaining virus free plants- True/False
- g. Serum containing media are frequently used for animal cell culture- True/False
- h. Most common method of gene transfer in animal cell is electroporation- True/False

Q.3. Short questions (2 marks each) attempt any ten

(2x10=20marks)

- [1] Differentiate between hereditary and inheritance.
- [2] Briefly discuss about the importance of Mendel's Principles.
- [3] Write a brief note on Recessive and Dominant Allele.
- [4] What is recombinant DNA?
- [5] Define transformation.
- [6] What is competent cells?
- [7] Write short notes on significance of embryo culture.
- [8] What is somatic organogenesis?
- [9] What do you mean by meristem culture?
- [10] Define cybrids and enlist its significance.
- [11] What is subprotoplast?
- [12] Why somatic hybrids is important?

Q4-Attempt any four (4x8=32)

1. Explain the mechanism of law of segregation in detail with application. **[8]**
2. Explain the mechanism of law of Dominance in detail with application. **[8]**
3. What is gene cloning? Explain various steps of gene cloning with neat diagram. **[8]**
4. What do you mean by blue and white selection? Explain with neat diagram. **[8]**
5. How can you produced haploid plants through Anther culture? Explain. **[8]**
6. Describe pollen culture with their application in plant tissue culture. **[8]**
7. Enlist and explain various methods to obtain somatic hybrids. **[8]**
8. Explain protoplast culture in detail. **[8]**

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