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[101] [ ] SARDAR PATEL UNIVERSITY

M.Sc. (IV Semester- CBCS) Examination

Subject: Biotechnology

PS04CBIT01; Plant Biotechnology

Monday, April 10, 2017

Time: 02.00 a.m. to 5.00 p.m.

Total Marks: 70

Note: Figures in brackets indicate marks
Answer all the questions in the given answer book

Q1. Choose the appropriate answer for the following multiple choice questions: (8x1=8)

i) Which culture systems assure the genetic stability of propagated plants:
(a) Shoot tip cultures (b) single node cultures
(c) In Vitro microtubers (d) All of these

ii) Which growth hormone is generally used to reduce the precocious germination of somatic embryos.
(a) Naphalene acetic acid (b) 6-furfuryl amino purine
(c) Abscisic acid (d) Gibberellic acid

iii) Which growth hormone is supplemented in the medium in lieu of suspensor during zygotic embryo cultures
(a) IAA (b) Kinetin (c) GA_3 (d) ABA

iv) The signal molecules that induce an array of defense response in plants are called:
(a) Elicitors (b) Pesticides
(c) Inducers (d) Phytoalexins

v) Which of the following enzymes can be used for production of Protoplasts from suspension cultures, callus tissues or intact tissues by enzymatic treatment with:
(a) celluytic enzymes (b) pectolytic enzymes
(c) cellulytic and pectolytic enzymes (d) proteolytic and cellulytic enzymes

vi) The secretion system for the export of T-DNA from *Agrobacterium* to the plant cell is synthesized by
(a) Vir D2 and E2 (b) Vir C
(c) Vir A and G (d) VirB and D4

vii) One of the important advantages of Marker Assisted Selection is
(a) It is highly reliable than conventional breeding for selection of desirable trait
(b) It does not involve IPR
(c) Ideal method for selection of phenotypes involving many genes
(d) All of the above

viii) TRIPS allows patenting of new plant varieties. However, India follows the principle of
a) No patents for plant varieties c) "sui generis"
b) Patents only for GM crops d) none of these

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Q2. Answer any SEVEN of the following in brief: (7x2=14)

a) Nurse culture Technique and its use
b) Draw a flow chart for production of synthetic seed
c) Leptohormone theory
d) Function of PEG in protoplast fusion
e) Write the advantages of zygotic embryo cultures
f) Binary vectors
g) Role of microprojectiles in Particle bombardment
h) Indian laws for the protection of new varieties
i) Structural barriers in plant defence

Q3. (a) Based on in vitro growth and development what are the various tissue culture systems identified? Write the applications of each culture system. (6)

(b) Write notes on anther cultures and their importance in agriculture (6)

OR

(b) What are the advantages of micropropagation over vegetative propagation? Discuss in detail various stages of Micropropagation. (6)

Q4 (a) Enlist methods used for direct gene transfer in plants. Explain any two methods with its merits and demerits. (6)

(b) Strategies for *In vitro* Germplasm conservation (6)

OR

(b) Outline various strategies used for in vitro secondary metabolite production and explain any one in detail. (6)

Q5 (a) Give an account of reaction parameters that control ligation. Why this step is considered crucial in rDNA technology? (6)

(b) What is Marker Assisted Selection? Which markers are commonly used in MAS? What are the advantages and limitations of this method? (6)

OR

(b) What are reporter genes? Explain the principle and advantages of any one reporter system in detail. (6)

Q6 (a) Explain the events that happen during Hypersensitive Response (HR). How is this different from Systemic Acquired Resistance (SAR)? (6)

(b) Explain in detail the role of Salicylic Acid as a signalling pathway in plant defense. (6)

OR

b) What are the basic requirements for patenting? Explain the role of TRIPS in plant variety protection (6)

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[28/3c/43]

[ ] SARDAR PATEL UNIVERSITY
M.Sc. (IV & II Semester- CBCS) Examination
Subject: Biotechnology/Microbiology/Biochemistry
PS04EBIT01/PS02EMICO1/PS02EBIC01;
Phytoresource Utilization & Conservation
Monday, April 18, 2017; Time: 10.00 a.m. to 1.00 p.m.

Total Marks: 70

Note: Figures in brackets indicate marks
Answer all the questions in the given answer book

Q1. Choose the appropriate answer for the following multiple choice questions: (8x1=8)

i) Habitat diversity over a large landscape or geographical area is referred as:
(a) Alfa diversity (b) Beta diversity
(c) Gamma diversity (d) Bio diversity

ii) The credit of popularizing the concept of Biodiversity mainly goes to:
(a) G.J. Martin (b) Earnest Heckel
(c) John Harshberger (d) E.O. Wilson

iii) Conifer wood is mostly composed of:
(a) Vessel elements (b) Tracheids (c) parenchyma (d) Fiber

iv) Ethnobotany deals with our:
(a) Economic uses of Biodiveristy (b) Ethnic uses of biodiversity
(c) Ethnic uses of phytoresources (d) Ethnic relations with phytoresources

v) Cultivation of traditional crop varieties in local agricultural lands is:
(a) Ex-situ conservation (b) In situ conservation
(c) Combination of ex-situ and in-situ conservation
(d) Neither ex-situ nor in-situ conservation

vi) Dicotyledon wood is known as:
(a) Porus wood (b) Hard wood
(c) Both (a) and (b) (d) Neither (a) nor (b)

vii) Which of the following trees is known for calcium rich fruits?
(a) *Moringa olifera* (Drumstick)
(b) *Phyllanthus emblica* (Indian goose berry)
(c) Both A and B
(d) Neither A nor B

viii) Growth rings are distinctly seen in the trees of:
(a) Monocots (b) Dicots (c) Conifers (d) None of these

Q2. Answer <u>any SEVEN</u> of the following in brief: (7x2=14)

(A) What are wild relatives? How are they important?
(B) What is reaction wood? What are its salient features? What is it significance?
(C) Giving any two suitable examples to justify how ethnobotany differs from economic botany.
(D) How does heart wood differs from sapwood? Which of these two more economically important? Why?
(E) Name any two Indian Ethnobotanists? What is their major contribution?
(F) What are bordered pits? What is their significance?
(G) List any two plant conservation centres of national importance. Where are they located?
(H) Give botanical names of any four gum yielding plants.
(I) What are botanical pesticides? What are their advantages? Give botanical names of two sources of such pesticides.

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Q3. **(A)** "Define Ethnobotany. Why is that it is said to be multidisciplinary subject? Justify your answer with reasons. (6)

(B) Give a comprehensive account on ethnomedicobotanical data collection. (6)

OR

(B) (i) The concept of Sacred Groves is a proved lesson on phytorsource conservation. Justify the statement. (3)

(ii) What is the botanical source of Indian saffron? What are its uses? (3)

Q4 **(A)** Listing botanical names, recommend any six avenue trees of your choice for an urban area. Give a brief note on each of their salient features. (6)

(B) "We obtain around 95% of our daily requirement of energy from a wide diversity of phytoresoures available to us. Do you agree with the statement? Justify your answer in either the case giving suitable examples. (6)

OR

(B) Name any four little known phytoresources, having scope for wider usage for their merits. Offer your innovative ideas for making them popular. (6)

Q5 **(A)** "Describe the origin, cultivation, useful products and uses of any two oil yielding crops studied by you. (6)

(B) What are the important criteria used for determination of the botanical source and quality of wood? (6)

OR

(B) Write notes on:

(i) Fiber yielding plants (3)

(ii) Gene banks (3)

Q6 **(A)** Write short notes on:

(i) Role of Botanical gardens in conservation of threatened phytoresources. (3)

(ii) Major threats to agribiodiversity (3)

(B) Justify **<u>any two</u>** of the following statements with suitable examples:

(i) "Many of the phytoresources can be potential alternatives for conservation of fossil fuels. (3)

(ii) "Palms and Fruit yielding trees are not good choice for plantations along highways" (3)

(iii) "Traditional knowledge on phytoresources is more threatened than the phytoresources." (3)

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SARDAR PATEL UNIVERSITY
M Sc IV Semester Examination
Date: 15-04-2017 Day: Saturday
Time: 02.00 PM To 05.00 PM
Subject: BIOTECHNOLOGY
Paper: PS04EBIT02 – Animal Biotechnology

Marks: 70

Q1.Select appropriate answer for the following. (8M)

(i) Which of the following cell adhesive molecule does not require Ca^{2+} for adhesion?

(a) Integrins (b) Selectin (c) Cadherin (d) N adhesion molecules

(ii) Which of the following is a liver specific cell line?

(a) Caco-2 (b) S180 (c) HEP-G2 (d) HeLa

(iii) At pH 10, phenol red indicator turns

(a) Purple (b) Pink (c) Yellow (d) White

(iv) The EDTA is required in the media to enhance disaggregation of

(a) Epithelia (b) Bone marrow (c) Adipose (d) Lymphocytes

(v) The differentiation property of neuroendocrine cells is

(a) Immunoglobulin (b) Domes
(c)Tyrosine aminotransferase (d) Catecholamines

(vi) The dihydrofolate reductase gene can be amplified by treating the cells with

(a)Methotrexate (b) Mitomycin C (c) Phorbol ester (d) Cytochalasin b

(vii) Influence of allergen on epidermis along with dermis can be checked by release of

(a) FGF (b) KGF (c) Cytokines (d) cAMP

(viii) Which of the following is not true for embryonic stem cells?

(a) Exhibit clonogenic properties
(b) Generated after gastrulation
(c) Undergo symmetrical cell division
(d) Can develop teratomas

Q2.Answer briefly any Seven from the following. (14M)

(1) Explain various modifications to increase oxygen availability for cells requiring high oxygen during culture.
(2) Name different types of laminar-flow hoods and write their importance in animal cell culture.
(3) How cell lines can be immortalized by using viral genes and telomerase?
(4) Explain the role of carbon dioxide in animal cell culture.
(5) Name any four neuroglial cells and state their functions.
(6) Explain the principle of flow cytometry and write its importance in cell separation.
(7) Write the importance of using poly-D-lysine and matrigel as substrate coating.
(8) Explain any two methods used for the development of transgenic cell line or transgenic animals.
(9) What is amniocentesis technique? Write its therapeutic significance.

Q3. (a) Describe the complete culture protocol for any simple or stratified epithelia. Write its characterization and applications. (6M)
(b) List out various assays to study apoptosis in cultured cells and describe any three assays in detail. (6M)

OR

(b) Describe any three assays to study cytotoxicity in cell line. (6M)

Q4. (a) Describe the organization of cell-cell junctions. (6M)
(b) Describe complete protocol for enzymatic and mechanical disaggregation of tissues to develop primary culture. (6M)

OR

(b) Discuss all the steps for the establishment of a cell line from primary culture. (6M)

Q5. (a) Describe various constituents of complete media. (6M)
(b) Why is the characterization of cell lines necessary? Discuss chromosomal analysis methods for cell line characterization. (6M)

OR

(b) Describe different conditions that improve clonal growth in monolayer culture and suspension culture. (6M)

Q6. (a) Describe the cell separation techniques based on the following aspects
(i)Cell density (ii) Cell size (iii) Antibody based technique (6M)
(b) Discuss the characteristics of transformed and malignantly transformed cell lines. (6M)

OR

(b) Write a note on adult stem cells. (6M)

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