SIC

SEAT No._____

[46]

No. of Printed Pages : 02

SARDAR PATEL UNIVERSITY
M.Sc (IV Semester) Examinations.
Thursday, 2nd November, 2017.
Time: 2.00 p.m TO 5.00 p.m

Paper: PS04CBIT01- Plant Biotechnology

Total Marks: 70

1. Choose the most appropriate answer: **(8 marks)**

i) The process of shoot formation from a callus tissue is known as...
   a. Differentiation
   b. Dedifferentiation
   c. Redifferentiation.
   d. All.

ii) Which of the following can be used to obtain haploid plants?
   a. Callus culture
   b. Anther culture
   c. Somatic embryogenesis
   d. None of these

iii) Which of the following region is NOT present in disarmed Ti-Plasmid vectors?
   a. Ori C b. Vir region c. Tumour genes d. T-DNA.

iv) Which of the following agents can be used for Protoplast fusion?
   a. PEG
   b. Liquid Nitrogen
   c. Liquid Carbon dioxide
   d. Carbon dioxide.

v) Which of the following culture system shows the maximum frequency of somaclonal variation?
   a. Zygotic embryo cultures b. Organ cultures
   c. Protoplast cultures d. Meristem tip cultures

vi) A cointegrated vector system involves
   a. Two independent plasmids
   b. Two plasmids that integrate inside the host
   c. a single integrated plasmid
   d. none of these

vii) Cry protein is found in the endospores of
   a. *Pseudomonas* sps
   b. *E.coli*
   c. *Bacillus thuringiensis*
   d. none of these

viii) Marker Assisted Selection is advantageous over conventional breeding in terms of
   a. Less time
   b. Cost effectiveness
   c. absence of unwanted gene transfer
   d. All of these

2. Write briefly on *any seven:* **(14 marks)**

1. Write about advantages of callus culture.
2. Somaclonal variation
3. Organogenesis
4. Binary vectors
5. Luciferase system as a reporter.
6. What sre elicitors? Give examples
7. Enlist five Secondary metabolites.
8. Differentiate: Organogenesis and Embryogenesis.
9. Nearly Isogenic lines

Answer the following in detail **(48 marks)**

3. (a) Explain the role of plant hormones plant tissue culture. (6)
   (b) Describe the procedure for isolation of protoplasts stepwise from leaf explants. (6)

   OR

   (b) Describe the procedure for somatic embryogenesis (6)

4. (a)Write a note on the principle of production and applications of haploid plants. (6)
   (b) Explain the principle and applications of somaclonal variation (6)

   OR

   (b) What is Biotransformation? Write a note on factors affecting production of Secondary metabolites. (6)

5. (a) Explain the method, advantages and limitations of *Agrobacterium* mediated transformation (6)

   (b) Write notes on:
   (i) Virus free plants (ii) Mechanism of action of BT toxin (6)

   OR

   (b) Explain the role of salicylic and Jasmonic acids in plant defence mechanism. (6)

6. (a) Write a note on Biolistic mediated gene transfer in plants. (6)
   (b) Explain Electroporation. What are its advantages and disadvantages (6)

   OR

   (b) Explain the methods followed for the production of BT crops (6)

xxxxxxxxxxxx

SC

SEAT No._____ No of Printed Pages : 02

[40/57/A-237] SARDAR PATEL UNIVERSITY
M. Sc. FOURTH SEMESTER EXAMINATION
DATE: 06-11-2017
PS04CMIC/BIT02: ENVIRONMENTAL BIOTECHNOLOGY
TIME: 2.00 TO 5.00 P.M. MAX.MARKS: 70

Q-1 Select most appropriate answer from the given choices. (08)

1. Bioavailability of PCB can be enhanced by microbial production of..
   a)Siderophores c) Biosurfactants
   b) Exopolysaccharides d) All of the above
2. *Acinetobacter calcoaceticus* is characterized by its ability to.....
   a)Accumulate glycogen c)Synthesize PHB in aerobic condition
   b)Hydrolyse polyphosphates in anaerobic condition d)All of the above
3. In anammox process electron acceptor is .....
   a) Ammonia b) Nitrate c) Nitric oxide d) Nitrite
4. Ectomycorrhyzal infection in plant roots is characterized by formation of .....
   a) Vescicles b) Sheath c) Arbuscules d) All
5. In UASB process microbial biomass form ....
   a) Biofilms b) Granular sludge c) Flocs d) All
6. A biotechnological process which removes the arsenopyrite from gold ore to produce a higher grade concentrated gold ore is called .....
   a)Bioleaching b)Bioaccumulation c)Biobeneficiation d) All
7. TCE can be cometabolized in presence of ----------.
   a)Methane b) Ethylene c) Ethane d) All
8. Which of the following enzyme of ligninolytic fungi does not require H_2O_2 for catalysis?
   a)Oxygenase b) Lignin peroxidase c) Laccase d) All

Q-2 Answer **any seven** short questions. (14)

a What is phytoextraction ?
b Neatly narrate the structure of PCB and PAH.
c Differentiate between floc forming and filamentous organisms.
d Explain the importance of desulfurization of coal.
e What is vermicomposting?
f Write the advantages of oxidation ditch over activated sludge process.
g Differentiate between BOD and COD.
h List the unique characteristics of methanogens.
i List the factors affecting bioleaching process.

Q-3A Explain the principle of fixed film processes and describe any one. (06)

Q-3B Neatly narrate flow diagram of activated sludge process and explain the operational parameters of activated sludge process. (06)

0R

Explain in detail mechanism and processes for biological nitrogen removal from waste water. (06)

Q-4A	Explain the microbiology and biochemistry of anaerobic digestion.	(06)
Q-4B	Discuss the fundamental aspects of composting and factors governing the process.	(06)
	OR	
	Enlist various rapid microbial assays for toxicity testing of waste water and describe any two.	(06)
Q-5A	Explain in detail adverse effects and biodegradation of aromatic hydrocarbons.	(06)
Q-5B	Write in detail on biostimulation approach in bioremediation.	(06)
	OR	
	Write a note on biofiltration of polluted air.	(06)
Q-6A	Enlist microbial insecticides and explain mode of action and applications of any one.	(06)
Q-6B	Explain the bioleaching processes for copper recovery.	(06)
	OR	
	Write in detail on Microbially enhanced oil recovery.	(06)

(53) SEAT No._____ Printed pages:02

SARDAR PATEL UNIVERSITY

M. Sc. (IV Semester) Examination: November 2017

Subject: Biotechnology

PS04EBIT01-Phytoresource Utilization & Conservation

Friday, November10, 2017

Time: 10.00 a.m to 1.00 p.m **Total Marks: 70**

Q.1 Choose the correct options and make a tick to the following: **(8)**

1.1. E.O. Wilson is known for his contributions in the area of.

(a) Biodiversity (b) Ethnobotany
(c) Ethnomedicine (d) Ecosystem Diversity

1.2. Gymnosperm wood is composed of:

(i) Tracheids (ii) Parenchyma
(iii) Fibers (iv) Vessels
Ans: (a) i &ii (b) ii & iii (c) i, ii & iii (d) i, ii, iii &iv

1.3. Which of the following plants has/have narcotic effects?

(i) Sarpgandha (ii) Poppy
(iii) Ashwagandha (iv) Anantmul
Ans: (a) i (b) ii (c) i & iii (d) ii & iv

1.4. Which of the following plants grows wild in Gujarat?

(a) Isabgol (b) Guggal
(c) Kokam (d) Sarpagandha

1.5. What is the second most serious threat to biodiversity?

(a) Exotic species (b) Habitat loss
(c) Pesticides (d) Tourism

1.6. We derive the major part of energy from:

(e) A wide variety of plants and animals
(f) A wide variety of fruits and vegetables
(g) A few variety of cereals and millets
(h) All the above

1.7. The term Ethnobotany is coined by:

(a) G.J. Martin (b) E.O. Wilson
(c) John Harshberger (d) Janki Ammal

1.8. Cryopreservation of genetic materials is an example of:

(a) ex-situ conservation (b) in-situ conservation
(c) Both (a) and (b) (d) Neither (a) nor (b)

(PTO)

Q.2. Write short answers to <u>any seven</u> of the following: **(14)**

2.1. State the role of botanical gardens in phytoresource conservation.

2.2. What is wood? Why is heartwood more durable than sapwood?

2.3. What is DMAPR (NRCMAP)? What are its prime objectives and contributions?

2.4. Give any two examples of monocot plants which can be used for making furniture. List the major uses of these plants.

2.5. What are the advantages of on-farm conservation of little known crops?

2.6. What are sacred groves? How are they linked with biodiversity conservation?

2.7. What are bio-fuels? Mentioning any two botanical sources of bio-fuels, write the advantages of bio-fuels.

2.8. What are wild relatives? How are they important?

2.9. What are botanical pesticides? How are they significant? List scientific names of any two plants which can be a source of botanical pesticides.

Q.3A. "As compared to the vast diversity of the plant kingdom, we could explore only a small portion for utilization". Justify the statement with adequate examples. **(6)**

3B. Define biodiversity. Give an explanatory note on different levels of Biodiversity. List any four very significant values of biodiversity with suitable examples. **(6)**

OR

3B. What are different causes and consequences of Biodiversity loss? **(6)**

Q.4A. Describe various aspects of documentation of traditional knowledge on phytoresources. **(6)**

4B. What is voucher specimen? What is its significance? How is it prepared? **(6)**

OR

4B. What are multipurpose trees? Listing botanical names of any four such trees, give a brief note on their uses. **(6)**

Q.5A. List any four medicinally important plants of India having high market demand. Make a note on the uses of the listed species **(6)**

5B. Write in detail about origin, cultivation, useful products and uses of any two food crops studied by you. **(6)**

OR

5B. Write in detail about origin, cultivation and uses of any two oil yielding plants studied by you. **(6)**

Q.6A. Of the two types of conservation methods whether *ex-situ* or *in-situ* method is more effective? Justify your answer with reasons. Add the limitations of the method chosen by you. **(6)**

6B. Write short notes on the following: **(6)**

iii. Field gene banks

iv. Parameters used for wood identification

OR

6B. Differentiate the following: **(6)**

iii. Hard wood and sap wood

iv. Economic botany and ethnobotany