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SARDAR PATEL UNIVERSITY EXAMINATION-2019
Class -TYBSc 5th Semester; Subject -Genetics
Course: US05CGEN04; Paper-Plant Biotechnology
Date: 18/11/2019 Monday

Time:10.00am-1.00pm Max.Marks:70

Q1. MCQs. Attempt all questions. [10]

i. **Embryo culture is used for**
(A) Establishing suspension culture
(B) Rescue of distant hybrids
(C) Somatic hybridization
(D) Haploid production

ii. **Hormone pairs required for a callus to differentiate are**
(A) Auxin and cytokinin (B) Auxin and gibberellin
(C) Ethylene and gibberellin (D) Cytokinin and gibberellins

iii. **The explants required in haploid culture is**
(A) only the petals (B) only the anthers
(C) only the stigma (D) only the sepals

iv. **When an enucleated protoplast is fused with a nucleated protoplast the hybrid is called**
(A) homokaryon (B) heterokaryon (C) somatic hybrid (D) cybrids

v. **Production of transgenic cotton resistant to lepidopteran insects utilizes a toxin-producing gene isolated from**
(A) *Pseudomonas fluorescens* (B) *Bacillus thuringiensis*
(C) *Bipolaris maydis* (D) *Clostridium tetani*

vi. **Glufosinate herbicide competitively inhibits an enzyme used in nitrogen metabolism is**
(A) Urease (B) Nitrate reductase
(C) Glutamine synthetase (D) Glutamate dehydrogenase

vii. **Which of the following cannot be used as a vector?**
(A) Phage (B) Plasmid (C) Bacterium (D) All are vectors

viii. **Electroporation technique is used efficiently for:**
(A) DNA separation (B) Gene transfer
(C) Somatic Hybridization (D) DNA isolation

ix. **ACC deaminase gene is responsible for**
(A) synthesis for ethylene
(B) degradation of ACC an immediate precursor to ethylene
(C) both (a) and (b)
(D) synthesis of polygalactouranase

x. **The Enzyme barnase shows--**
(A) Protease activity (B) DNase activity
(C) RNase activity (D) Helicase activity

Q2. **Short questions. Attempt any TEN questions.** [20]

a. Explain with diagram only genes on T- DNA of Ti plasmid
b. Define nurse culture and somatic hybrid
c. Differentiate between binary vector and cointegrate vector.
d. Describe the terms electroporation and electrofusion.
e. Define and explain symmetric and asymmetric hybrids.

(PTO)

f. Expand these abbreviations--EPSPS, ACC, GUS & PAT.
g. Enlist the advantages of edible vaccine.
h. Explain the terms flavr savr tomato and golden rice.
i. Explain the role of barstar in making a male sterile plant.
j. Define somaclonal variations enlist its causes.
k. Enlist all the methods used to transfer gene in plants.
l. Define edible vaccine and give its applications.

Q3a. Define callus. Explain in detail suspension culture. [07]
Q3b. Give applications of plant tissue culture. [03]

OR

Q3a. Explain heat sterilization methods in detail. [07]
Q3b. Explain the role of agar-agar in media preparation. [03]

Q4. What is the mechanism behind protoplast fusion? Discuss the chemical methods used for making somatic hybrids. [10]

OR

Q4. Write a detailed note on the screening of heterozygous hybrids. [10]

Q5a. What changes are required in Ti plasmid for its use as a vector. Explain the Ti plasmid based binary vectors. [07]
Q5b. Write a note on microinjection method of gene transfer in plants. [03]

OR

Q5a Discuss in detail about biolistic method of gene transfer. [07]
Q5b. Write a short note on npt-II and hpt-II as marker [03]

Q6 Discuss in detail about the Bt toxin and its use in making insect resistant plants. [10]

OR

Q6 Write note on following transgenics:
a. Golden rice [06]
b. Barnase/Barstar syatem [04]

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