

(2)

Total Pages-5

VPG (4)-Bot (14)
Cyto. & Crop. Imp.

2016-18

Full Marks : 70

Time : 3 hours

Answer any five questions in which
Q.No.1 is compulsory.

The questions are of equal value.

*Candidates are required to give their answers in
their own words as far as practicable.*

1. Choose the correct answer :

- (a) Haploid plants from microspores were first raised in a tissue culture laboratory by
- (i) P. Maheswari
 - (ii) E. M. Southern
 - (iii) S. G. Mukherji
 - (iv) M. S. Swaminathan
- (b) Callous tissue may be produced easily from
- (i) Foliar explants

(Turn Over)

(ii) Apical meristem

(iii) Xylem tissue

(iv) Petals

(c) The recognition sequences of restriction enzymes are commonly

(i) Palindromic hexamers

(ii) Non-palindromic hexamers

(iii) Catalytic tetramers

(iv) Non-catalytic tetramers

(d) *Agrobacterium tumefaciens* carries

(i) Only a Ti plasmid

(ii) Only an Ri plasmid

(iii) Both Ti and Ri plasmids together

(iv) Neither Ti nor Ri

(e) Genetically engineered 'Flavr Savr' tomato carries

(i) A foreign gene

(ii) A silenced gene

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(Continued)

(3)

- (iii) An additional ripening gene
- (iv) A tight skin gene
- (f) Precipitation of DNA by an organic solvent is possible when it is in
- (i) Acid form
- (ii) Salt form
- (iii) Zwitter ion form
- (iv) Super ion form
- (g) Chromosome of *Escherichia coli* in native form is
- (i) Supercoiled
- (ii) Circular
- (iii) Double stranded
- (iv) All of the above
2. Discuss major problems associated with protoplast culture. Enumerate the advantages of protoplast culture over normal tissue culture.
3. Discuss the major steps of how to clone a gene synthesized in a thermocycler. Describe a test that confirms that right gene has been cloned in a right orientation.

(4)

4. Answer any *two* of the following :
- (a) Strategy to resist abiotic factors to boost production
- (b) Molecular farming
- (c) Ethylene
- (d) Plant vaccines
5. Describe the principle and method of error-free DNA sequencing. <http://www.vbuonline.com>
6. What is cDNA ? Describe a laboratory method of generation of cDNA library.
7. Distinguish between the following, any *two*, pairs :
- (a) BAC and YAC vectors
- (b) Northern and Western blots
- (c) Type I and type II sampling errors
- (d) Student 't'-test and Chi-square test
8. What is somatic cell hybridization ? Describe various methods of hybridization in the laboratory using protoplasts.

(5)

9. Write short notes on any *two* of the following :

(a) Artificial seeds

(b) MS medium

(c) Pollen culture

(d) Electroporation

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