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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD PUNE SEMESTER END EXAMINATION



B.Sc. (Agri.)

Semester : V (New)	Term : I	Academic Year : 2011-12
Course No. : BOT 356	Title : Principles of Plant Biotechnology	
Credits : 3(2+1)		
Day & Date : Thursday, 22.09.2011	Time : 14.00 to 17.00	Total Marks : 80

- Note :
1. Solve ANY EIGHT questions from SECTION "A".
 2. All questions from SECTION "B" are compulsory.
 3. All questions carry equal marks.
 4. Draw neat diagrams wherever necessary.

SECTION "A"

- Q.1 What do you mean by biotechnology? Write in detail about branches of biotechnology and scope and importance of biotechnology.
- Q.2
- a) What is transformation?
 - b) Enlist the method of gene transfer in plants.
 - c) Which is the widely adopted plant transformation method?
- Q.3 Write in detail about nutritional requirement of plant tissue culture.
- Q.4 Write down about techniques of plant tissue culture.
- Q.5
- a) Define Embryo Culture.
 - b) What are the applications of Embryo culture?
- Q.6 Define Soma clonal variation. Explain in detail about mechanism of soma clonal variation.
- Q.7 Define artificial seeds. What are the steps for making artificial seeds?
- Q.8 Define Anther culture and write in detail about protocol for Anther culture.
- Q.9
- a) Define Somatic hybrid.
 - b) Write down about method of Isolation of protoplast.
- Q.10 Write short notes (Any Two)
- 1) Southern blotting
 - 2) DNA finger printing application
 - 3) Types of mapping population

SECTION "B"

- Q.11 Define the following terms.
- 1) Aseptic
 - 2) Callus
 - 3) Biotechnology
 - 4) Tissue
 - 5) Explants
 - 6) Micro-propagation
 - 7) In-vitro
 - 8) Totipotency

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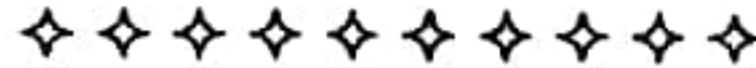
Q.12 Match the pairs.

“A”

“B”

- 1) Indole acetic acid
- 2) Benzyl adenine
- 3) Industrial Biotechnology
- 4) Karl Earke
- 5) Skoog and Miller
- 6) Guha and Maheshwari
- 7) Gautheret white
- 8) G. Haberlandt

- a) Salt solution formulation
- b) Anther culture in Datura
- c) Concept of Hormonal Control
- d) Cytokinin
- e) Father of Tissue culture
- f) Auxin
- g) Branch of Biotechnology
- h) Coined the term Biotechnology



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MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD PUNE
SEMESTER END EXAMINATION



B.Sc. (Agri.)

Semester : V (New)	Term : I	Academic Year : 2010-11
Course No. : BOT 356	Title : Principles of Plant Biotechnology	
Credits : 3(2+1)		
Day & Date : Saturday, 16.10.2010	Time : 14.00 to 17.00	Total Marks : 80

- Note :
1. Solve ANY FIVE questions from SECTION "A".
 2. All questions from SECTION "B" are compulsory.
 3. All questions carry equal marks.
 4. Draw neat diagrams wherever necessary.

SECTION "A"

- Q.1 Define somatic embryogenesis. Describe in brief the developmental pattern of somatic embryos. Differentiate between somatic embryos and zygotic embryos.
- Q.2 Define tissue culture. Discuss the application of *in vitro* cultures in agriculture.
- Q.3 Define anther culture. Discuss the factors affecting anther culture and limitations of anther culture techniques.
- Q.4 Define somaclonal variation. Describe in brief the procedures used for obtaining somaclonal variation along with achievements in somaclonal variation.
- Q.5 Define Genetic Engineering. Discuss in brief the indirect method of gene transfer along with a diagram.
- Q.6 What is a molecular marker? Enlist its types. Explain in brief any three of them.
- Q.7 Write short notes on
- 1) Mapping population
 - 2) Southern blotting
 - 3) Restriction enzymes
 - 4) Test tube fertilization

SECTION "B"

- Q.8 Define the followings
- 1) Biotechnology
 - 2) Organ culture
 - 3) Ovule culture
 - 4) Vector
 - 5) QTL
 - 6) Callus
 - 7) Batch culture
 - 8) Asymmetric hybrid
 - 9) DNA probes
 - 10) Double haploids
- Q.9 Give the contribution of following scientists in one or two lines.
- 1) Murashige and Skoog
 - 2) Laibach
 - 3) Maheshwari and Guha
 - 4) Kary B. Mullis
 - 5) Braun
 - 6) G. Morel
 - 7) Karl Ereky
 - 8) P.R. White
 - 9) Edward and Cocking
 - 10) W.H. Muir

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Q.10 Fill in the blanks.

- 1) The process of organogenesis resulting in the formation of shoot is known as _____.
- 2) Shoot buds are _____ structure.
- 3) _____ callus is suitable for suspension culture.
- 4) The plating technique for culturing cells or protoplasts is developed by _____.
- 5) Commercially exploited technique of tissue culture is _____.
- 6) Disease free or virus free plants are obtained by _____ culture.
- 7) Embryos isolated before _____ stage are most suitable for embryo culture.
- 8) Somatic hybrid plants which retain the full or nearly full somatic complements of the two parental species are called _____.
- 9) _____ is a short sequence that pairs with one strand of DNA and provides free 3' off end at which a DNA polymerase starts synthesis of a deoxyribonucleotide chain.
- 10) _____ are commonly used as explants for protoplast culture.



MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester : V (New)	Term : I	Academic Year : 2013-14
Course No. : BOT 356	Title : Principles of Plant Biotechnology	
Credits : 3(2+1)		
Day & Date : Wednesday, 23.10.2013	Time : 14.00 to 17.00	Total Marks : 80

- Note :**
1. Solve ANY EIGHT questions from SECTION "A".
 2. All questions from SECTION "B" are compulsory.
 3. All questions carry equal marks.
 4. Draw neat diagrams wherever necessary.

SECTION "A"

- Q.1 What is micropropagation? Enlist stages of micropropagation and describe applications of micropropagation.
- Q.2 Define plant biotechnology. Give a brief account on features and scope of plant biotechnology.
- Q.3 What is genetic engineering? Describe steps involved in genetic engineering process.
- Q.4 Describe the techniques of embryo culture and discuss their various applications.
- Q.5 Define the term transgenic plant and describe in brief its application and achievements.
- Q.6 What is media? Explain in brief the basic constituent of media.
- Q.7 Define totipotency. Why all cells are not totipotent in culture? Mention the importance of totipotency in plant science.
- Q.8 What do you mean by somatic hybridization? Enlist steps involved in it and describe in detail methods for protoplast fusion.
- Q.9 What are molecular markers? Write down different molecular markers along with their applications.
- Q.10 Write short notes on. (Any Two)
- | | | |
|---------|---------------------|-------------------|
| 1) RFLP | 2) Cryopreservation | 3) Synthetic seed |
|---------|---------------------|-------------------|

SECTION "B"

- Q.11 Define the following terms.
- | | | |
|--------------------|----------------|-------------------------|
| 1) Vector | 2) Plasmid | 3) Somaclonal variation |
| 4) Differentiation | 5) Sub culture | 6) Organoids |
| 7) Cybrid | 8) Explant | |
- Q.12 Give major contribution of following scientists.
- | | | |
|-------------------|------------------------|------------------|
| 1) Kary B. Mullis | 2) Murashige and Skoog | 3) E.C. Cocking |
| 4) C.H. Chen | 5) W.H. Muir | 6) G. Haberlandt |
| 7) Laibach | 8) Maheshwari and Guha | |

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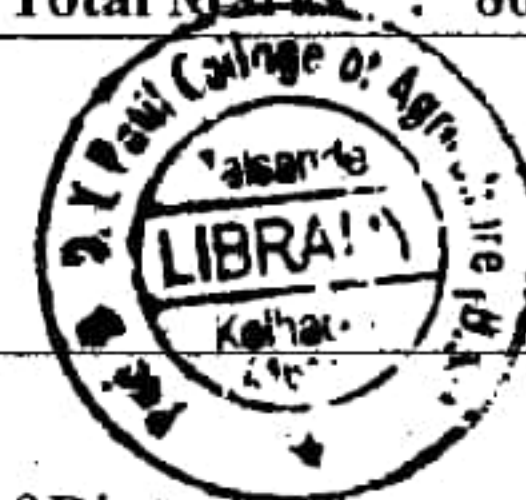
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SEMESTER END EXAMINATION

B.Sc. (Agri.)

Semester : V (New)	Term : I	Academic Year : 2015-16
Course No. : BOT 356	Title : Principles of Plant Biotechnology	
Credits : 3(2+1)		
Day & Date : Monday, 26.10.2015	Time : 14.00 to 17.00	Total Marks : 80

- Note : 1. Solve ANY EIGHT questions from SECTION "A".
2. All questions from SECTION "B" are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

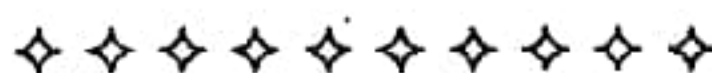


SECTION "A"

- Q.1 Define Biotechnology. Give a brief account on branches and scope of Biotechnology.
- Q.2 What is micropropagation? Describe in brief stages and advantages of micropropagation.
- Q.3 What is media? Explain in brief the basic constituents of media.
- Q.4 Define tissue culture. Discuss the applications of *in-vitro* cultures in agriculture.
- Q.5 What is mean by somatic hybridization? Enlist steps involved and describe methods of protoplast fusion.
- Q.6 What is DNA recombinant technology? Describe steps involved in genetic engineering process.
- Q.7 What is artificial seed? Describe steps for making artificial seeds and limitations of artificial seed.
- Q.8 Write short notes on (Any two).
1) Secondary metabolites
2) Totipotency
3) Transgenic plants
- Q.9 What is haploid production? Describe different factors affecting androgenesis and applications of androgenesis.
- Q.10 Define molecular markers. Describe different molecular markers along with their application.

SECTION "B"

- Q.11 Define the following terms.
- | | |
|-------------------------|----------------------|
| 1) Callus | 2) Dedifferentiation |
| 3) Somaclonal variation | 4) Vector |
| 5) Cybrid | 6) Explant |
| 7) Protoplast | 8) Sub culture |
- Q.12 Give the contribution of following scientists.
- | | |
|-----------------|-----------------------|
| 1) G. Morel | 2) Maheswari and Guha |
| 3) Karl Ereky | 4) Edward and Cocking |
| 5) G Haberlandt | 6) Laibach |
| 7) C H Chen | 8) Ian Wilmut |



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