Marks scored:

KATHMANDU UNIVERSITY
End Semester Examination [C]
July, 2017

Level : B. Tech.
Year : III

Course : BIOT 303
Semester : I

Exam Roll No. :

Time: 30 mins.

F. M. : 20

Registration No. :

Date JUL 12 2017

SECTION "A"
[10 Q. × 0.5 = 5 marks]

Choose and tick [√] the most appropriate answer.

1. Treatment of 2-chloro ethyl phosphonic acid ethrel induces
[ ] organogenesis [ ] androgenesis
[ ] apical meristem culture [ ] somatic embryogenesis

2. *In vitro* fertilized egg is cultured in
[ ] milli cell [ ] test tube [ ] cover slip [ ] cavity slide

3. Which growth regulator is responsible for root development?
[ ] Auxin [ ] BAP [ ] Cytokinin [ ] Kinetin

4. *Vir* E genes encode.....
[ ] pilus [ ] topoisomerase [ ] endonuclease [ ] SB proteins

5. Mitotic crossing over is responsible for
[ ] somatic hybridization [ ] protoplast culture
[ ] somaclonal variation [ ] somatic embryogenesis

6. 5-enolpyruvylshikimate-3-phosphate synthase is key enzyme in the production of
[ ] tyrosine [ ] fatty acid [ ] auxin [ ] enzyme

7. Which chemical is micronutrient?
[ ] Inositol [ ] Calcium chloride
[ ] Cobalt chloride [ ] Potassium nitrate

8. The microspores divide by an equal division and two identical daughter cells contribute to the sporophyte development in
[ ] *Hyoscyamusniger* [ ] *Nicotianatabbacum*
[ ] *Daturastramonium* [ ] *Daturainnoxia*

9. PVX and PVS are entirely eliminated by
[ ] apical meristem culture [ ] thermotherapy
[ ] mixed therapy [ ] cryotherapy

10. .....damages the soft plant tissues.
[ ] Quinone [ ] resin [ ] tannin [ ] lignin

SECTION "B"

[5Q. × 1 = 5 marks]

Fill in the blanks:

11. Heat treatment may inactivate plants.....

12. Proliferation media forms.....

13. Spring rape consists herbicide resistant gene in .....

14. Hydrated synthetic seeds are encapsulated by.....

15. Germination of somatic embryo is induced by.....

SECTION "C"

[5 Q. × 2=10 marks]

Define in *one* sentence:

16. Auxin:

17. Molecular farming:

18. T-DNA:

19. Opines:

20. Vitrification:

21. Illegitimate Recombination:

22. Gametoclonal Variation:

23. 1 Stage of micropropagation:

24. Embryo rescue:

25. Elicitor:

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SECTION "D"
(Long answer questions)
[3Q. × 7=21 marks]

Attempt *ALL* questions.

1. What is *in vitro* culture? Explain its deficiencies, limitation,and application.

2. Describe the developmental process of somatic embryogenesis with the help of suitable diagrams.

3. What is protoplast?Give the detail account on isolation, culture andplant regeneration of protoplast.

SECTION "E"
(Short answer questions)

4. Write short notes on: [6 Q. × 4 = 24]
   a) Hairy root culture
   b) Haploid plant production
   c) Apical meristem culture
   d) Callus
   e) Somaclonal variation
   f) Protoplast fusion

5. Give *TWO* major differences between: [2 Q. × 2 = 4]
   a) Anther and pollen culture
   b) *In vitro* and *in vivo* rooting

6. Explain why/how for the following: [3 Q. × 2 = 6]
   a) Cellulase is used for isolation of protoplast.
   b) Crown gall disease is caused by *Agrobacterium*.
   c) Sucrose is added in plant cell culture media.