



BIOLOGY

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PLANT TISSUE CULTURE

Textbook Question And Answers

1. Totipotency refers to

A. capacity to generate genetically identical plants

B. capacity to generate a whole plant from any plant cell / explant

C. capacity to generate hybrid protoplasts

D. recovery of healthy plants from diseased plants

Answer: B



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2. Micro propagation involves

A. Vegetative multiplication of plants by using micro organism

B. Vegetative multiplication of plants by using small explants.

C. Vegetative multiplication of plants by using microspores

D. Vegetative multiplication of plants by using microspores and megaspores

Answer: B



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3. Match the following

Column A	Column B
1. Totipotency	A. Reversion of mature cells into meristem
2. Dedifferentiation	B. Biochemical and structural changes of cells
3. Explant	C. Properties of living cells develops into entire plant
4. Differentiation	D. Selected plant tissue transferred to culture medium

A. C A D B

B. A C B D

C. B A D C

D. D B C A

Answer: A



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4. The time duration for sterilization process by using autoclave is _____ minutes and the temperature is _____

A. 10 and 30 min and $125^{\circ}C$

B. 15 to 30 minutes and $121^{\circ}C$

C. 15 to 20 minutes and $125^{\circ}C$

D. 10 to 20 minutes and $121^{\circ}C$

Answer: B



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5. Which of the following statement is correct?

- A. Agar is not extracted from marine algae such as seaweeds
- B. Callus undergoes differentiation and produces somatic embryoids
- C. Surface sterilization of explants is done by using mercuric bromide
- D. pH of the culture medium is 5.0 and 6.0

Answer: B



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6. Select the incorrect statement from given statement.

A. A tonic used for cardiac arrest is obtained from Digitalis purpuria

B. Medicine used to treat Rheumatic pain is extracted from Capsium annum

C. An anti malarial drug is isolated from Cinchona officinalis

D. Anti carcinogenic property is not seen in Catharanthus roseus

Answer: A



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7. Virus free plants are developed from

- A. Organ culture
- B. Meristem culture
- C. Protoplast culture
- D. Cell suspension culture

Answer: B



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8. The prevention of large scale loss of biological integrity is

A. Biopatent

B. Bioethics

C. Biosafety

D. Biofuel

Answer: C



9. Cryopreservation means it is a process to preserve plant cells, tissues or organs

A. at very low temperature by using either

B. at very high temperature by using liquid nitrogen

C. at very low temperature of -196 by using liquid nitrogen

D. at very low temperature by using liquid nitrogen

Answer: C



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10. Solidifying agent used in plant tissue culture is

A. Nicotinic acid

B. Cobaltous chloride

C. EDTA

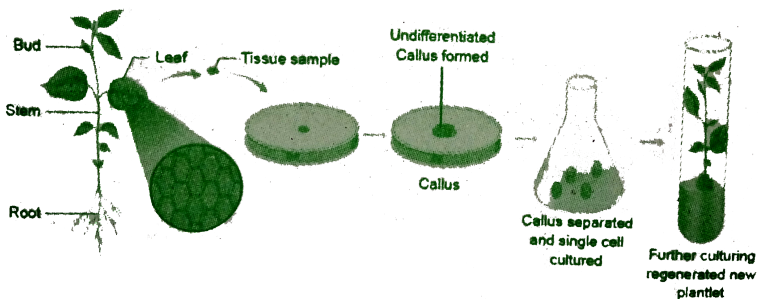
D. Agar

Answer: D



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11. What is the name of the process given below? Write its 4 types.



The given process is plant tissue culture . Four types of plant tissue culture include :



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12. How will you avoid the growing of microbes in nutrient medium during culture process? What are the techniques used to remove the microbes?



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13. Write the various steps involved in cell suspension culture.



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14. What do you mean by Embryoids? Write its application.



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15. Give the examples for micro propagation performed plants.



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16. Explain the basic concepts involved in plant tissue culture.



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17. Based on the material used, how will you classify the culture technology?



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18. Give an account on cryopreservation.



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19. What do you mean by Germplasm conservation? Describe it.



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20. Write the protocol for artificial seed preparation.



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Other Important Question Answers Mcqs

1. Somatic embryogenesis is now reported in:

A. Mango

B. Potato

C. Rice

D. Cucumber

Answer: C



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2. Organogenesis can be induced by

A. Glycine

B. Vitamin

C. Aspartic acid

D. Auxin

Answer: D



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3. The phenomenon in which the mature cells are transformed into meristematic state is called:

A. Differentiation

B. Dedifferentiation

C. Redifferentiation

D. Totipotency

Answer: B



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4. Cryopreservation is a process of preserving plant materials by cooling to very low temperature of

A. $-190^{\circ}C$

B. $-195^{\circ}C$

C. $-185^{\circ}C$

D. $-20^{\circ}C$

Answer: B



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5. Virus free plants are produced by a method called

- A. Protoplast culture
- B. Organ culture
- C. Apical meristem culture
- D. Tissue culture

Answer: C



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6. Choose the odd man out:

A. Carlson

B. Chiton

C. Kanta

D. T.H Morgan

Answer: D



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7. Find the odd one out

A. Magnesium sulphate

B. Auxin

C. Nicotinic acid

D. Potassium nitrate

Answer: B



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8. Identify the odd one out

A. Artificial seed

B. Embryoids

C. Somatic hybrid

D. Plantlets

Answer: C



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9. Choose the odd one out

A. Agar

B. Kinetin

C. Myo-inositol

D. Glucose

Answer: A



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10. Indicate the odd one out

- A. *Capsicum annum*
- B. *Cathranthus roseus*
- C. *Oryza sativa*
- D. *Cinchona affcinalis*

Answer: C



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11. Choose the correct pair

- A. Digoxin: Analgesic
- B. Codeine -Cardiac tonic
- C. Quinine-Animalarial
- D. Vincristine-Antibacterial

Answer: C



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12. Which of the following is the incorrect pair

A. Cell culture- Liquid medium

B. Somatic Hybrid- Fusion of protoplast

C. Protoplast culture- Ms liquid medium

D. Organ culture- Polyethylene glycol

Answer: D



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13. Choose the correct pair

A. Micropropagation-Coconut plant

B. Secondary metabolites-Cosmetics

C. Somaclonal-Heat resistant

D. Gametoclonal-Herbicide resistant

Answer: B



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14. Assertion: Artificial seeds are produced by using embryoids obtained through invitro culture.

Reason: They may be derived from single cells from any part pf the plant

A. Asseration and Reason are correct, Reason is the correct explanation of Assertion

B. Assertion and Reason are correct, Reason is the correct explanation of Assertion

C. Assertion is not correct, Reason is correct

D. Both Assertion and Reason are not correct

Answer: B



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15. Assertion: MS nutrient medium is commonly used in tissue culture.

Reason: It has carbon sources, with suitable

vitamins and hormones essential for plant growth.

A. Assertion and Reason are

correct, Reason is the correct explanation of Assertion

B. Assertion and Reason are correct, Reason

is the correct explanation of Assertion

C. Assertion is not correct, Reason is correct

D. Both Assertion and Reason are not

correct

Answer: A



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16. Assertion: The callus cells undergo redifferentiation and produce somatic embryos.

Reason: The embryoids are sub cultured to produce plantlets.

A. Assertion and Reason are

correct, Reason is the correct explanation

of Assertion

B. Assertion and Reason are correct, Reason

is the correct explanation of Assertion

C. Assertion is not correct, Reason is correct

D. Both Assertion and Reason are not

correct

Answer: C



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17. Assertion: Quinine is produced by the cells of *Capsicum annum* through invitro culture.

Reason: Quinine is the used as anticarcinogenic agent.

A. Asseration and Reason are

correct,Reason is the correct explanation

of Assertion

B. Assertion and Reason are correct,Reason

is the correct explanation of Assertion

C. Assertion is not correct,Reason is correct

D. Both Assertion and Reason are not correct

Answer: D



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18. Which of the following statement is correct?

A. The process of production of metabolites can be scaled up and

automated using bioreactors.

B. Biosynthesis of indole alkaloids is carried out by *Capsium annum*

C. Biosynthesis of indole alkaloids is carried out by *Vinca rosea*

D. None of the above

Answer: A



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19. Choose the incorrect statement

A. Improved hybrid plants can be produced through somatic hybridization

B. Somatic hybrids can be encapsulated into synthetic seeds

C. Production of disease resistant plants can be carried out by cells suspension culture

D. Production of metabolites through cell suspension culture

Answer: C



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20. Find out the correct statement

A. Glycerol is used as a cryopreservation agent in cryopreservation of plant material

B. Glycerol is used as a percentage agent in cryopreservation of plant material

C. Auxin is used as a cryoprotectant in cryopreservation of plant materials

D. None of the above

Answer: B



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21. Choose the incorrect statement :

A. Vasil and Hildebrandt developed invitro production of haploid embryos from the anthers of *Datura*

B. Guha and maheswari produced calli and free cells in tissue culture of *Tradeseantia reflexa*

C. Carlson regenerated tobacco plant from isolated mesophyll protoplasts

D. All the above statement are correct

Answer: D



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Other Important Question Answers Answer The Following

1. Mention any two indian scientists who worked on tissue culture of plant



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2. What is meant by Totipotency?





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3. What is explant?



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4. Define sterilization.



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5. Define Embryogenesis





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6. Name any two vitamins used in plant tissue culture works



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7. What is organogenesis?



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8. What is meant by Synthetic seeds?



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9. What are Gene banks?



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10. What do you understand by intellectual property right (IPR)?



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11. Write a short note on biosafety.



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12. Name are two apex bodies for the implementation for biosafety guidelines.



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13. Explain the term dedifferentiation



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14. Write the steps to sterilize the explants in plant tissue culture?



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15. Compare Redifferentiation with Dedifferentiation.



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16. How do you induce callus formation in nutrient medium?



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17. Explain the process of hardening



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18. Describe the method of Isolation of protoplast.





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19. Give the different types of metabolites their sources and uses.



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20. Differentiate between Somaclonal variations and Gametoclinal variation.



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21. Describe the production of secondary metabolites in plants.



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22. Describe the important steps involved in the micropropagation of banana plant.



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23. What are the advantages of artificial seeds?



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24. What are the main components of Intellectual Property Right (IPR)



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25. Write the application of plant tissue culture.



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26. Highlight the protocol for production of virus free meristem tip culture.



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