**Principles of Biotechnology**

**Short Questions:**

**1. Match the following**

|  |  |
| --- | --- |
| 1. Green Biotechnology  | A. Medical sacience  |
| 2. Somaclonal variation  | B. Haberlandt  |
| 3. Protoplast isolation  | C. Plants  |
| 4. Father of tissue culture  | D. Klercker  |
| 5. Red Biotechnology  | E. Larkin and Scowcroft  |

**Multiple choice questions (2-11)**

**2. What are the technologies applied in plant biotechnology?**

a. Tissue culture b. rDNA technology c. Marker assisted selection d. All

**3. What is/are the types of tissue culture?**

a. Callus culture b. Embryo culture c. Shoot culture d. All

**4. Cell and tissue culture technology is**

1. Grow cells/tissues under laboratory conditions to produce an entire organism, or to produce new products
2. use of cellular enzymes to manipulate DNA
3. Improve existing/create novel proteins to make useful products
4. Block or decrease the production of certain proteins

**5. The term totipotency means**

1. the capability of a cell to form an individual plant
2. the capability of a plant to form an individual cell
3. Both of the above
4. None of the above

**6. Embryo culture has been successful in overcoming the problems**

1. Low seed set b. Seed dormancy c. Slow seed germination d. All of the above

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**8. What is Androgenesis?**

1. Development of plants from male gametophytes
2. Development of plants from female gametophytes
3. Development of plants from leaf
4. None of the above

**9. Which of following is/are cryoprotectant material(s)?**

1. Hydrogel b. Alginate gel c. DMSO d. All of the above

**10. developed desiccated artificial seeds from SE ?**

1. Redenbergh b. Kim & Janicle c. None of them d. All of them

**11. Who first time demonstrated totipotency ?**

1. Steward b. Murashige and Skoog c. Haberlandt d. All of them

**Long Questions:**

1. What is biotechnology? Who give the term biotechnology?
2. How many methods are available for genomic DNA extraction? Enlist the names.
3. What is the component used for precipitation of genomic DNA?
4. What is the difference between inorganic and organic method of genomic DNA isolation?
5. What is totipotency? Why plant cells are called totipotent?
6. What is genomics?
7. What is bioinformatics?
8. Give some examples of 3 rd generation sequencing platforms.
9. What are enzymes used in pyrosequencing?
10. How many ddNTPs are used in Sanger’s sequencing method?
11. What are the chemicals used in Maxam-Gilbert sequencing method?
12. What is the difference between dominant and co-dominant marker?
13. Why we are using molecular markers instead of morphological markers?
14. What are the characteristics of a cloning vector?
15. Differentiate between Cosmid and Phagemid.
16. Write down the process of genomic DNA isolation.
17. Write down the function of lysis buffer and isopropanol in genomic DNA isolation.
18. For the preparation of 100ml Phenol:Chloroform:Isoamyl alcohol (PCI) (25:24:1) mixture how much amount of Phenol, Chloroform and Isoamyl alcohol need to be added?
19. Write down the procedure of explant inoculation in media.
20. Write down the components of plant tissue culture media.
21. Prepare 200ml 70% ethanol solution.
22. What is tissue culture? What do you mean by differentiation? Write down the process of tissue culture.
23. What is somatic hybridization? What is somaclonal variation? What is cybrid?
24. Why embryo rescue is important? What is the need of artificial seed production?
25. What is rDNA technology? Write down the classification of DNA manupulative enzymes. Write down applications of rDNA technology.
26. Write down the types of plant transformation methods.
27. What is MAS? What are the advantages of MAS. Write down the applications of molecular markers.
28. Write down the full form- DBT, RDAC, IBSC, RCGM, GEAC, SBCC, DLC, FAO, WHO, AFLP.
29. What is rDNA technology? What are the tools for rDNA technology? Write down the characteristics of vector.
30. Write down the procedure of Agrobacterium mediated transformation.
31. Write down the ideal features of molecular markers. Differentiate between dominant and co-dominant markers.