

1. In maize, hybrid vigour is exploited by
 - 1) crossing of two inbred parental lines
 - 2) harvesting seeds from the most productive plants
 - 3) bombarding the seeds with DNA
 - 4) inducing mutations
2. The first transgenic plant to be produced was
 - 1) rice
 - 2) tobacco
 - 3) flax
 - 4) cotton
3. Most varieties of sugarcane are
 - 1) tetraploids
 - 2) triploids
 - 3) hexaploids
 - 4) aneuploids
4. Main varieties of potato are
 - 1) tetraploids
 - 2) triploids
 - 3) aneuploids
 - 4) diploids
5. Variety with odd ploidy can be made fertile through
 - 1) Micropropagation
 - 2) Mutations
 - 3) Reducing chromosome number
 - 4) Doubling of chromosome number

6. Which one is a triploid crop
 - 1) Banana
 - 2) Groundnut
 - 3) Potato
 - 4) Mango
7. Norin-10 gene is a dwarfing gene of
 - 1) Wheat
 - 2) Rice
 - 3) Oat
 - 4) Maize
8. Modification and adjustment of an organism to local environment is called
 - 1) Introduction
 - 2) Selection
 - 3) Acclimitisation
 - 4) Quarantine
9. Maximum genetic diversity of crop plants occurs where agriculture is
 - 1) Run on commercial lines
 - 2) Advanced
 - 3) Rainfed
 - 4) Primitive

10. Which is more suitable for germplasm collection

- 1) center of production
- 2) homelands
- 3) tropical areas
- 4) temperate areas

11. One of the reasons why wild plants should be conserved is because they are good sources of

1. unsaturated edible oils
2. highly nutritive animal feed
3. very rare and highly sought after fruits
4. genes for resistance to diseases and pest

12. "Terminator gene" was introduced into the plant

1. rice
2. potato
3. cotton
4. wheat

13. Differentiation of callus into plant parts is

1. embryogenesis
2. embryoid formation
3. morphogenesis
4. totipotency

14. Morphogenesis in culture medium is controlled by hormones, was discovered by

1. Muir *et al*
2. Vasil and Hiderbrandt
3. Skoog and Miller
4. Helperin and Wetherell

15. Two protoplasts can be made to fuse through the application of

1. electrofusion
2. polyethylene glycol
3. sodium nitrate
4. all of the above

16. Flavr savr variety of tomato is improved variety developed through

1. hybridization between old varieties
2. hybridization between old and new varieties
3. mutation variety
4. incorporation of transgene

17. Which of the following is not used for crop improvement?

1. inbreeding
2. introduction
3. hybridization
4. mutation

18. Which of the following produce androgenic haploids in anther culture?

1. anther wall
2. tapetal wall
3. connective tissue
4. young pollen grains

19. Most of our crop plants are
1. autopolyploid
 2. allopolyploid
 3. mixed genotypic in origin
 4. heterozygous in origin
20. Sterilization of tissue culture medium is done by
1. mixing medium with antifungal agents
 2. filtering the medium through fine sieve
 3. keeping the medium at -20°C
 4. autoclaving the medium at 120°C for 15 minutes
21. The name "Golden rice" is given to a transgenic rice variety because
- 1) it contains traces of gold
 - 2) it is obtained from areas where gold mining is done
 - 3) the seeds are golden yellow in colour because of the presence of beta-carotene
 - 4) it has xanthophylls pigment

22. The golden rice is produced to help people suffering from

- 1) beri beri
- 2) scurvy
- 3) xerophthalmia
- 4) skin disease

23. A variety of rice plant, into which genes were transferred to produce “Golden rice” is

- 1) IR-22
- 2) Basmathi
- 3) Taipe-30 a
- 4) Sona

24. *Bacillus thuringiensis* strains have been used for developing novel

- 1) biofertilizers products
- 2) biomineralization process
- 3) bioremediation process
- 4) bioinsecticidal plants

25. Bt cotton is preferred over other varieties of cotton because of its
- 1) weedicial property
 - 2) resistance to white ants
 - 3) fungicidal property
 - 4) resistance to bollworm
26. Bt gene which produces protein toxic to insect larvae is
- 1) Cry
 - 2) cry
 - 3) Trp
 - 4) trp
27. Increased flavourful shelf life of tomato has been achieved by
- 1) developing better storage technique
 - 2) reducing activity of enzyme polygalactourinase
 - 3) promoting activity of enzyme polygalactourinase
 - 4) enhancing epidermal growth factor

28. A cybrid is a

1. cytoplasmic hybrid
2. nonsomatic hybrid
3. cellular hybrid
4. hardened explants

29. Protoplast culture involves

1. somatic cell hybridization
2. cytoplasmic hybridization
3. embryo hybridization
4. both (1) and (2)

30. Molecular farming involves

1. transgenic animals carrying human genes
2. cloning human beings
3. transgenic plants carrying animal genes
4. all of the above

31. The basic components of tissue culture media are

- 1) micro and macro nutrients, glucose, agarose, vitamins
- 2) micro and macro nutrients, growth regulators, agar
- 3) micro and macro nutrients, growth regulators, agar, vitamins, amino acids, glucose
- 4) micro and macro nutrients, glucose, amino acids, growth regulators, vitamins

32. Glucose is added to the tissue culture media as

- 1) a growth regulator
- 2) a carbon source
- 3) a solidifying agent
- 4) an antibiotic

33. All the cells in a callus are

- 1) genetically homogeneous
- 2) genetically heterogeneous
- 3) similar in size
- 4) inefficient to grow organs

34. Totipotency refers to

- 1) the ability of a plant cell to a specific tissue
- 2) the ability of a plant cell to develop into an organ
- 3) the ability of a plant cell to develop into a complete plant
- 4) the ability of a plant cell to develop into a callus

35. In vitro culture of plant parts need

- 1) controlled light, temperature, pH, humidity, salinity
- 2) controlled light, pH, aseptic conditions, humidity
- 3) controlled light, temperature, humidity, pH, aseptic conditions
- 4) controlled light, humidity, aseptic conditions, temperature conditions

36. An amorphous mass of loosely arranged thin walled parenchyma cells developing from explant is called

- 1) thallus
- 2) callus
- 3) callose
- 4) embryoid

37. All the cells in a callus are

- 1) genetically homogeneous
- 2) genetically heterogeneous
- 3) similar in size
- 4) inefficient to grow organs

38. Fruit juice or coconut milk is added to plant tissue culture media because

- 1) it is a source of micronutrients
- 2) it is a source of macronutrients
- 3) it is a source of growth regulators
- 4) it helps in maintaining pH of the medium

39. Which one of the following statements about plant tissue culture is correct?

- 1) cells can be cultured only on solid medium
- 2) cells can be cultured both on solid and liquid medium
- 3) callus do not need hormones
- 4) the cells of the callus cannot be subcultured

40. The production of a large number of genetically similar plants through plant tissue culture is called

- 1) hybridoma technology
- 2) recombinant DNA technology
- 3) callus culture
- 4) micropropagation

41. Embryo culture is adopted

- 1) to rescue embryos from interspecific hybrids
- 2) to remove chances of seedling mortality
- 3) to obtain new generation of plants quickly
- 4) to induce somaclonal variations

42. The enzymes required to obtain protoplasts for somatic hybridization are

- 1) cellulase and proteinase
- 2) cellulase and pectinase
- 3) cellulase and amylase
- 4) amylase and pectinase

43. Pollen embryoids were discovered by

- 1) Konar and Nataraja
- 2) Guha and Maheshwari
- 3) Skoog and Miller
- 4) Helperin and Wetherell

44. Common cytokinin of tissue culture is

- 1) benzylaminopurine
- 2) kinetin
- 3) zeatin
- 4) dihydrozeatin

45. Cluster of undifferentiated plant cells that may be induced to form a whole plant in tissue culture is called

1. explant
2. callus
3. embryoid
4. clone

46. Protoplast fusion can be accomplished using

1. REN
2. Mab
3. PEG
4. PEN

47. The introduction of a desired gene into the nucleus of the zygote, can be done using a

1. micromanipulator
2. microneedle
3. micropipette
4. microloop

48. To obtain an animal of desired sex, which of the following technique is useful?

1. embryo transfer
2. sperm sexing
3. totipotency
4. artificial insemination

49. Animal breeding techniques may not involve

1. AI
2. stem cell culture
3. ET
4. sperm sexing

50. The first IVF-ET technique success was reported by

1. Jeffreys, Wilson and Thien
2. Robert Steptoe and Gilbert Brown
3. Patrick Steptoe and Rohert Edwards
4. Louis Joy Brown and Banting Best

51. The process of introduction of foreign DNA into an animal cell is called

- 1) transversion
- 2) conversion
- 3) inversion
- 4) transfection

52. Pluripotent stem cells can be obtained from
- 1) embryo only
 - 2) bone marrow, umbilical cord blood, epidermal cells
 - 3) bone marrow, spinal cord, two celled embryo
 - 4) bone marrow, umbilical cord blood, blastula of embryo
53. Transgenic animals like cattle which can produce recoverable quantities of pharmaceutically or biologically important proteins are referred to as
- 1) hybrids
 - 2) cybrids
 - 3) bioreactors
 - 4) special varieties
54. Which of the following techniques would most likely be used to produce a large number of genetically identical offsprings
- 1) cloning and in vitro culture
 - 2) polymerase chain reaction
 - 3) hybridoma technology
 - 4) somatic gene technology

55. A hybrid where the cytoplasm of two parent cells are fused by retaining only one parental nucleus is called

- 1) cybrid
- 2) asymmetric somatic hybrid
- 3) symmetric somatic hybrid
- 4) homozygous hybrid

56. If a nucleus of a somatic cell is transferred to an enucleated egg cell, then the organism developing from it will have cells that are

1. diploid
2. haploid
3. triploid
4. enucleate

57. The source of stem cells may not be

1. bone marrow
2. umbilical cord
3. embryo
4. skin tissue

58. The undifferentiated cells with the capacity of self renewal and differentiation are called

1. hybrid cells
2. stem cells
3. permanent cells
4. monoclonal cells

59. The transgenic oncomouse has

1. a cancer inducing plasmid
2. a gene for cancer
3. a gene for antibiotic
4. a gene for disease resistance

60. Gene transfer mediated by virus is called

1. transduction
2. cloning
3. conjugation
4. recombination

61. The process of transduction was discovered by

1. Jefferys
2. Milstein
3. Lederberg and Tatum
4. Zinder and Lederberg

62. Mule is the result of

1. interspecific hybridization
2. intraspecific hybridization
3. intergeneric hybridization
4. intrageneric hybridization

63. The transgenic sheep “Dolly” was cloned by

1. Wilkins
2. Jacob
3. Alec Jeffrys
4. Swaminathan

64. "Tissue Plasminogen activator"

1. dissolves blood clots after heart attack
2. stimulates wound healing
3. activates blood to form more plasma
4. helps in treating diabetes

65. Bioremediation is

- 1) genetically engineered organisms capable of producing antibiotics
- 2) biological control
- 3) biopurification of environment
- 4) a method of gene therapy

66. Frost resistance is obtained from genetically engineered

- 1) *Escherichia coli*
- 2) *Pseudomonas putida*
- 3) *Pseudomonas fluorescence*
- 4) *Trichoderma sps*

67. The greatest hazard caused by genetic engineering could be

- 1) Loss of vitality in organisms
- 2) Creation of resistant weeds
- 3) Replacement of human organs
- 4) Creation of new human pathogens

68. Which of the following bacteria is employed by environmental biologists to clear petroleum oil spills in seas and oceans?

1. *Pseudomonas aeruginosa*
2. *Pasturella aeruginosa*
3. *Thiobacillus pudita*
4. *Pseudomonas pudita*

69. Micropropagation of the explants does not help in

1. crop improvement to get novel traits
2. preservation of germplasm
3. production of disease free plants
4. production of large number of plants

70. Crossing of two genetically different plants to get a better offspring is called

1. genetic mapping
2. hybridization
3. bioreaction
4. finger printing

71. "Hybrid vigour" results due to

1. breeding
2. pollen culture
3. gene insertion
4. hybridoma technique

72. Cryopreservation can be done after

1. finger printing
2. reverse transcription
3. hybridization
4. gene therapy

73. When an altered foreign genetic material is included into an organism's genome, it results in a

1. transgenic organism
2. soma-clonal variation
3. totipotent organism
4. polyclonal organism

74. Totipotency is because of the fact that

1. a single cell can give rise to an entire plant
2. the explants has the capacity to grow into "thallus"
3. both (1) and (2)
4. (2) is the reason for (1)

75. Genetically identical cells can be called

1. an explants
2. a clone
3. a genome
4. a probe