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MCQ for M. Sc.(iv) sem. Botany (Tissue culture &Biotechnology)

TIME- ….. HOURS **MM-…….**

NOTE- 1) : All questions are compulsory.

2):There is no negative marking, Answers are to be recorded on the OMR Answer sheet only…….

1.Plant biotechnology involves

a production of valuable products in plants **b) rapid clonal multiplication of desired genotypes**

c) production of virus free plants **d) all of these**

2. The most common solidifying agent used in micropropagation is

a) agar **b) dextran** **c) Mannan** **d) all of these**

3. The culturing of cells in liquid agitated medium is called

a) liquid culture **b) micro propagation** **c) Agar culture** **d) suspension culture**

4. Which of the following is best suited method for production of virus free plants

a)embryo culture **b) meristem culture** **c) ovule culture** **d) anther culture**

5. Batch cultures are type of suspension culture where

a) medium is continuously replaced **b) medium is loaded only at the beginning**

c) no depletion of medium occurs **d) cellular wastes are continuously removed and replaced**

6. Immobilized cell bioreactors are based on

a) cells cultures in solid medium **b) cells cultured in liquid medium**

c) cells entrapped in gels **d) all of these**

7. All are plant derived alkaloids except

a) menthol **b) nicotine** **c) quinine** **d) codeine**

8. Elicitors are molecules that

a) induce cell divison b) stimulate production secondary metabolites

c) stimulate hairy root formation that accumulate secondary metabolites d) none of these

9. All are plant derived elicitors except

a) chitin b) pectin c) cellulose d) pectic acid

10. The modification of exogenous compounds by plant cells is called

a) Biotransformation b) bioconversion c) both a and b d) biophytomodification

11. Artificial seeds are

a) seeds produced in laboratory condition b) seeds encapsulated in a a gel

c) somatic embryos encapsulated in a gel d) zygotic embryos encapsulated in a gel

12. Hairy root cultures for secondary metabolite production are induced by transforming plant cells withs

a) virus b) *Agrobacterium tumefaciens*

c) *Bacillzus thuringiensis* d) *Agrobacterium rhizogenes*

13. The variation in invitro culture is called as

a) invitro variation b) mutation c) somaclonal variation d) all of these

14. Haploid plants are produced in large numbers by

a) anther culture b) Ovary culture c) both a and b d) embryo culture

15. Cybrids are

a) nuclear hybrids b) hybrid plants derived from cross pollination

c) cytoplasmic hybrids d) cytological hybrids

16.In plant tissue culture, what is term ORGANOGENESIS mean ?

a) formation of callus culture b) formation of root and shoot from callus culture

c) genesis of plants d) none of the above

17. A recombinant DNA molecule is produced by joining together

1. one mRNA with a DNA segment 2. one mRNA with a tRNA segment

3. two mRNA molecules 4. Two DNA segments

18. A gene produced for recombinant DNA technology contains a gene from one organism joined to the regulatory sequence of another gene. Such a gene is called

1. oncogene 2. junk gene 3. chimeric gene 4. None

19. A group of genetically similar organisms obtained by asexual reproduction is called

1. Clone 2. Population 3. Assembly 4. None

20. To be useful in the preparation of recombinant DNA, a plasmid must have

1. No origin of replication 2. An origin of replication

3. The ability to alternate between the linear and circular forms 4. Restriction endonuclease activity.

21. Restriction endonucleases have the ability of cutting

1. RNA at random sites 2. DNA at specific sites

3. Both a and b 4. DNA and RNA at random sites

22. Endonucleases, a group of enzymes cleave DNA

1. Externally 2. Internally 3. Both 1 and 2 4. Neither a nor b

23. The extra chromosomal, self replicating, double stranded, closed, circular DNA molecules are called

1. Plasmids 2. Phages 3. Viruses 4. Chloroplasts

24. A plasmid consisting of its own DNA with a foreign DNA inserted into it is called

1. recombinant DNA 2. non-coding DNA

3. junk DNA 4. none of the above

25. Insulin, a protein, consisting of

1. 2 Polypeptide chains 2. 3 Polypeptide chains

3. 4 Polypeptide chains 4. more than 4 Polypeptides chains

26. The first human protein produced through recombinant DNA technology is

1. insulin 2. Erythropoitin 3. Interferon 4. ABA

27. Humulin, a genetically engineered insulin was produced for the first time by

1. Biocon India Limited 2. Glaxo 3. Elililly and Company 4. Cipla

28. The first licenced drug produced through genetic engineering is

1. interferon 2. insulin 3. Penicillin 4. somatotropin

29. Before the production of recombinant insulin, insulin for the treatment of diabetes in human was obtained from

1. healthy humans 2. dead human body

3. cows and pigs 4. dogs and cats

30. The first plasmid used for the production of recombinant insulin is

1. pBR 322 2. Ti plasmid 3. ACY 17 4. pUC 18

31. In one of the techniques of recombinant insulin production the genes for α and β polypeptides were inserted into the plasmid by the side of

1. ori 2. β - galactosidase gene

3. antibiotic resistant gene 4. restriction endonuclease gene

32. During recombinant insulin synthesis, the bond between insulin polypeptide and galactosidase can be removed by using

1. cyanogen bromide 2. chymotrypsin

3. carboxy peptidase 4. amylase

33. Prior to the production of recombinant insulin, insulin obtained from cows and pigs were given to patients. Some of the problems faced by this treatment was

1. the insulin was not active

2. in some humans it induced antibody production

3. it reduces the weight of patients

4. loss of memory power

34. A plant called *Rauvolfia serpentina* is under the threat of extinction. To save this plant, which technique is highly useful?

1. genetic engineering 2. DNA finger printing

3. hybridoma technology 4. in vitro culture

35. Which group of enzymes are popularly called "Molecular stichers"

1. restriction Endonuclease 2. ligases

3. RNA polymerase 4. DNA polymerase

36. A clone is a group of organisms produced by

1. asexual method and genetically similar

2. asexual method and genetically dissimilar

3. sexual method and genetically similar

4. sexual method and genetically dissimilar

37. Match the following:

1. Restriction endonuclease p. Kary Mullis

2. DNA Finger printing q. Kohler and Milstein

3. Polymerase chain reaction r. Alec Jaffreys

4. Monoclonal antibodies s. Arber

1. 1-s, 2-r, 3-p, 4-q 2. 1-s, 2-r, 3-q, 4-p

3. 1-q, 2-r, 3-p, 4-s 4. 1-s, 2-p, 3-q, 4-r

38. Some of the steps involved in Gene Cloning are given below

i) Insertion of isolated gene to the vector

ii) Introduction of recombinant vector to the host

iii) Isolation of desired gene

iv) Expression of recombinant gene in host

v) Extraction of recombinant gene product

The correct sequence of steps involved are

1. iii, i, iv, ii, v 2. iii, i, ii, iv, v 3. i, ii, iii, iv, v 4. ii, i, iii, iv, v

39. A gene for insulin has been inserted into a vector for the purpose of obtaining its protein product only. Such a vector is called

1. expression vector **2. suppression vector**

3. storage vector for genomic library **4. none of the above**

40. Expression vectors are those

1. produce protein products **2. used for genomic libraries**

3. used for chromosome synthesis **4. used for finger printing**

41. E. coli is generally used for gene cloning because

1. it supports the replication of recombinant DNA

2. it is easy to transform

3. it is free from elements that interferes with replication and recombination of DNA

4. all of these

42. An ideal plasmid to be used for recombinant DNA technology must have

1. minimum amount of DNA **2. relaxed replication control**

3. one recognition site for one restriction endonuclease **4. all of these**

43. Transgenic organisms are

1. produced by gene transfer technology

2. extinct organisms

3. naturally occurring and endemic

4. produced by traditional plant breeding technique

44. Transfer of recombinant plasmid into E. Coli cells needs

1. heat treatment **2. UV rays treatment** **3. Cacl2 treatment** **4. lysis**

45. Which of the following statement about a vector is correct

1. all vectors are plasmids only **2. plasmids, phages can be used as vectors**

3. fungi can also be used as vectors 4. cyanobacteria can also be used as vectors

46. Which of the following statement about plasmids is correct?

1. plasmids are present in bacteria , archea& some eukaryotes

2. plasmids are present in all organisms

3. plasmids present in bacteria and phages 4. plasmids present in plants and animals

47. Which one of the following statement are not attributed to plasmids

1. they are circular DNA molecule 2. they have antibiotic resistant genes

3. they have the ability of autonomous replication

4. they have DNA that is as long as chromosomal DNA

48. Which one of the following statements about Restriction Endonuclease is true

1. all endonucleases cut DNA at specific sites restriction

2. all restriction endonucleases cut DNA at random sites

3. all restriction endonucleases join DNA segments atspecific sites

4. all restriction endonucleases join DNA at random sites

49. Restriction endonucleases cut DNA at a specific site called

1. ligation site 2. Ori 3. recognition sequence 4. replication site

50. Restriction endonucleases, when present in a host cell act on foreign DNA molecule and cleave them, but they do not act on host DNA molecule. It happens because

1. Restriction endonuclease cannot act on host DNA

2. Host DNA is packed into chromosomes

3. Host DNA is methylated hence restriction endonucleases can't act.

4. Restriction endonucleases become inactive when they reach host DNA

51. The presence of Restriction endonucleases were postulated in 1960 by

1. Khorana 2. Watson 3. Crick 4. Arber

52. The scientists who won nobel prize for physiology for their discovery of restriction endonucleases are

1. Jacob and Monad 2. Smith, Nathans and Arber

c) Watson and Crick 4. Alec Jaffreys and Milstein

53. Restriction endonucleases are also called

1. molecular scissors 2. molecular stichers

3. DNA synthesis 4. polymerases

54. In restriction endonuclease EcoR1, "E" stands for

1. extraction 2. the first letter of the genus in which it is present

3. endonuclese 4. endangered

55. EcoR1 cleaves DNA at

1. 5/G AATTC3/ 2. 5/GTT↓AAC3/CTTAA G5/ 3/CAA↑TTG5/

3. 5/C↓AATTG3/ 4. 5/GGGCC↓T3/3/GTTAA↑C5/ 3/CCCGG↑A5/

56. Restriction endonucleases recognize specific sequences on DNA called

1. non-coding sequences 2. satellites

3. palindromes with rotational symmetry 4. tandem repeats

57. Main tools required for recombinant DNA technology are

1. vector, desired gene

2. vector, desired gene, mRNA of desired gene, host, restriction enzymes, ligases

3. desired gene, host, vector

4. vector, desired gene, mRNA of desired gene, host

58. An example for autonomously replicating mini chromosome is

1. virus 2. phage 3. Plasmid 4. lichen

59. Which one of the following statements about plasmids is correct

1. plasmids are mobile 2. plasmids are made up of RNA and proteins

3. plasmids are present in eukaryotes 4. plasmids are present in fungi

60. DNA Ligase, used in recombinant DNA technology is obtained from

1. E.coli only 2. E.coli and also Ligase encoded by T4 phage

3. Saccharomyces 4. retroviruses

61. DNA finger printing was first developed by

1. David Suzuki 2. Khorana 3. Alec Jaffreys 4. Gilbert

62. Using genetic technique in forensic science is also called

1. genetic finger printing 2. In vitro culture

3. hybridoma technology 4. gene therapy

63. A technique called southern blotting is used in

1. monoclonal antibody production 2. In vitro culture

3. genetic finger printing 4. polymerase chain reaction

64. Genetic finger printing is useful in

1. identifying the criminals involved in rape, murder etc.,

2. establishing the parentage of a disputed child

3. identifying illegal immigrants

4. all of these

65. RFLP is

1. restriction fragment length polymorphism

2. repeated fragment length polymorphism

3. renewed fragment length polymorphism

4. required fragment length polymorphism

66. VNTR is

1. variable nucleotide triplet repeat 2.variable nucleoside tandem repeat

3. variable nucleoside triplet repeat 4.variable number of tandem repeats

67. A small, 15-30 bases long nucleotide sequences used to detect the presence of complementary sequences in DNA sample during DNA finger printing is called

1. RFLP 2. Probe 3. VNTR 4. reporter gene

68. A radio active probe used in DNA finger printing contains

1. 33 p 2. 14 C 3. 12 N 4. pUC18

69. Electrophoresis, a technique used in DNA fingerprinting helps to separate

1. DNA segments 2. cells from DNA 3. Tissues 4. RNA from DNA

70. In DNA finger printing, even a smallest amount of DNA obtained from samples collected at crime place, can be multiplied into millions of copies by using a technique called

1. autoradiography 2. southern blotting

3. polymerase chain reaction 4. electrophoresis

71. In DNA finger printing, the DNA from the gel is transferred to _____ for hybridization

1. nitrocellulose membrane 2. agarose 3. Autoradiogram 4. PCR

72. Southern blotting is a technique used in genetic finger printing is called so because,

1. the blotting is done from the south side 2. it was discovered by a scientist, E.M. Southern

3. it was popular in South America 4. it was popular in sourthern countries

73. During DNA finger printing, DNA nucleotides hybridized with probe can be detected through

1. electrophoresis 2. polymerase chain reaction

3. autoradiography 4. hybridoma

74. RFLP, VNTR, Probe are some of the terminologies associated with

1. hybridoma technology 2. tissue culture

3. DNA fin printing 3. none

75. Dolly, the first animal produced through cloning is

1. camel 2. Rat 3. Cow 4. sheep

76. Some of the steps involved in DNA finger printing are listed below

I. Extraction of DNA II. Collecting the sample

III. Treating DNA with REN IV. GEL Electrophoresis

V. Transfer segments of DNA to nitrocellulose membrane

VI. Hybridize with probe VII. Autoradiography.

The correct sequence is _____

1. ii, iii, iv, vi, v, i, vii 2. ii, i, iii, vi, v, vi, vii

2. iv, i, ii, v, iii, vi, vii 4. i, iv, v, ii, iii, vi, vii

77. Gene therapy, a technique that helps in

1. saving endangered species 2. curing genetic disorders

3. clonal propagation 4. producing monoclonal antibodies

78. In 1990, the first gene-therapy was conducted on a 4 year old girl in US. The girl was suffering

1. AIDS 2. CANCER 3. SCID 4. Malaria

80. SCID, a disease can be cured by Gene therapy is due to the deficiency of

1. ADA enzyme 2. Insulin 3. Glucagon 4. Dystrophin

81. Gene therapy, a technique to cure inherited diseases by

1. repairing the faulty gene 2. introducing the correct copy of the gene

3. adding new cells to the body 4. polymerase chain reaction

82. During gene therapy, the possible ways through which the genes can be introduced into the cell are

1. micro injection 2. some viruses 3. both 1 and 2 4. erythrocytes

83. In one type of gene therapy, functional genes are introduced into the sperm or the egg. This is called

1. somatic cell gene therapy 2. germline gene therapy

3. vegetative cell gene therapy 4. gametic gene therapy

84. In somatic cell gene therapy, the functional genes can be introduced into

1. sperm 2. egg 3. any body cells 4. germinal cells

85. The genes introduced through somatic cell gene therapy are

1. heritable 2. non-heritable 3. partially heritable 4.none of these

86. The main aim of human genome project is

1. to identify and sequence of all the genes present in the human body

2. to introduce new genes to human beings

3. to remove disease causing genes from humans

4. to improve techniques of finger printing

87. Bt cotton is a

1. a cotton variety obtained by crossing two different cotton plants

2. a cotton variety brought from South America

3. an insecticide sprayed on cotton plant **4. a transgenic cotton variety**

88. In biotechnology, mass culturing of cells / microbes can be achieved by using

1. Test tube culture **2. Bioreactor** **3. Autoclave** **4. electrophoresis**

89. A device in which a substrate of low value is utilized by living cells or enzymes to generate a product of higher value is called

1. bioreactor **2. test tube culture** **3. Electrophoresis** **4. chromotography**

90. A bioreactor known for mass culturing of cells / microbes must have

1. agitation for mixing of cells and medium **2. sterile conditions**

3. regulation of temperature, aeration, etc., **4. all of these**

91. Bioreactors are used for

1. large scale production of desired substances by using cells /microbes

2. kill bacteria **3. to store viruses** **4. to get chemicals**

92. The basic components of tissue culture media are

1. micro and macro nutrients, glucose

2. micro and macro nutrients, vitamins, agar

3. micro and macro nutrients and growth regulators, glucose

4. micro and macro nutrients, growth regulators, agar, vitamins, glucose

93. Agar agar is added to tissue culture media as

1. carbon source
2. a growth regulator
3. nitrogen source
4. solidifying agent

94. Agar agar, used in plant tissue culture is extracted from,

1. a fungi
2. a bacteria
3. an algae
4. a virus

95. Glucose is added to the tissue culture media as

1. growth regulator
2. carbon source
3. solidifying agent
4. an antibiotic

96. Explant is

1. any cut part of the plant used in tissue culture
2. a plant extract used in tissue culture
3. a source of growth regulators added to media
4. solidifying agent

97. Totipotency refers to

1. the ability of a plant cell to arrest the growth of a plant
2. the ability of a plant cell to develop disease in plant
3. the ability of a plant cell to develop into a complete plant
4. the inability of a plant cell to develop into a callus

98. Somatic embryos are

1. embryos developed from zygote after fertilization
2. embryos developed from egg without fertilization
3. embryo like structure developed from the cells of callus
4. embryo developed by ovules

99. In vitro culture of plant parts need

1. controlled environmental condition
2. aseptic condition

3. maintenance of pH 4. all of these

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

1. thallus 2. Callus 3. Callose 4. embryoids

101. The unique feature of callus is

1. it gives rise to cells only 2. it can give rise to zygotic embryos

3. it can give rise to root, shoot and embryoids 4. it can give rise to flowers directly

102. Meristem culture helps in developing

1. hybrid plants 2. virus free plants

3. disease resistant plants 3. tall plants

103. Genetic variation observed in callus obtained from tissue culture is called

1. morphogenesis 2. rhizogenesis

3. callogenesis 3. somaclonal variation

104. The name "Golden rice" is given to a 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 β – carotene

4. it is made of gold

105. Golden rice is

1. hybrid rice developed by traditional plant breeding

2. a rice variety obtained by plant tissue culture

3. a rice variety obtained by recombinant DNA technology 4. None of the above

NOTE: Red marked option one is correct option.