



Gujarat Biotechnology Research Centre

Plant BT

This question booklet contains 28 pages

Application No: _____

Time: 2 Hours

Total Marks: 200

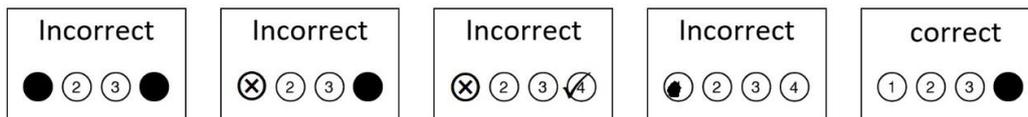
Total Questions: 200

Invigilator Signature :

Candidate Signature :

Instructions for Candidate

1. This question booklet contains 200 questions.
2. Each correct answer carries 1 mark.
3. Every attempted question with incorrect answer shall carry a negative mark of 0.25.
4. Use only Black Ball Point Pen to darken the appropriate circle in OMR.
5. Please darken the complete circle.
6. Darken ONLY ONE CIRCLE for each Question as shown below:



7. Answer once marked cannot be changed.
8. Please do not make any stray marks on the Question Booklet.
9. Rough works must be done on the blank page of Question Booklet.
10. Mark your answer in the appropriate space in the Answer Sheet against the Number corresponding to the question.
11. The Candidate has to submit Question booklet and OMR response sheet to the invigilator on conclusion of examination.

- 1 Choose correct technique where the stationary phase held in a narrow tube and the mobile phase is forced through it under pressure.
 - (A) Column chromatography
 - (B) Planar chromatography
 - (C) Liquid chromatography
 - (D) Gas chromatography

- 2 The resolving power of a microscope is a function of _____
 - (A) Wavelength of light used for the study
 - (B) Numerical aperture of lens system
 - (C) Refractive index
 - (D) Wavelength of light used and numerical aperture of lens system

- 3 The sequence of one strand of DNA is 5' TCGATC 3'. The sequence of the complementary strand would be
 - (A) 5' AGCTAG 3'
 - (B) 5' GATCGA 3'
 - (C) 5' CTAGCT 3'
 - (D) 5' GCTAGC 3'

- 4 Oxsomes of F₀ – F₁ particles occur on
 - (A) Thylakoids
 - (B) Endoplasmic reticulum
 - (C) Inner mitochondrial membrane
 - (D) Chloroplast surface

- 5 Precursor of Indole-3-acetic acid is
 - (A) Tryptophan
 - (B) Glycine
 - (C) Valine
 - (D) Proline

- 6 The recombinant vector with disarmed T-DNA and vir region sequences is called
 - (A) Shuttle vector
 - (B) Binary vector
 - (C) Binding vector
 - (D) False vector

- 7 Two proteins with same molecular weight and PI can be best resolved by
 - (A) Ion exchange chromatography
 - (B) Gel filtration chromatography
 - (C) Reverse phase chromatography
 - (D) Chromatofocusing

- 8 Which of the following statements is true?
 - (A) The p-value is the probability of the sample data arising by chance.
 - (B) The p-value is an arbitrary value, designated as the significance level.
 - (C) The p-value is the chance of getting an observed effect if the null hypothesis was false.
 - (D) A very small p-value allows us to say that there is enough evidence to accept the null hypothesis.

- 9 NADP⁺ is reduced to NADPH in
(A) PS I
(B) PS II
(C) Calvin cycle
(D) Noncyclic photophosphorylation
- 10 In C₄ plants, Calvin cycle operates in
(A) Stroma of bundle sheath chloroplasts
(B) Grana of bundle sheath chloroplasts
(C) Grana of mesophyll chloroplasts
(D) Stroma of mesophyll chloroplasts
- 11 Which of the following technique is used to amplify DNA using two oligo- nucleotide primers?
(A) Southern blot technique
(B) PCR techniques
(C) Western blot technique
(D) Slot blot technique
- 12 What is polygenic disorder?
(A) Single mutated gene contribute to a single disorder
(B) Multiple mutated genes contribute to multiple disorders
(C) Multiple genes contribute to multiple disorders
(D) Multiple mutated genes contribute to a single disorder
- 13 A very efficient converter of solar energy with net productivity of 204 kg/m² or more is the crop _____
(A) Wheat
(B) Sugarcane
(C) Rice
(D) Bajara.
- 14 Purification of an antigen using specific antibody is an example of _____
(A) Ion –exchange chromatography
(B) Gel filtration
(C) Affinity chromatography
(D) Salting out
- 15 What are the enzymes used for protoplast isolation?
(A) Pectinase and cellulose
(B) DNA polymerase I and II
(C) Alkaline and acid phosphatases
(D) Peroxidase and esterase
- 16 For assimilation of one CO₂ molecule, the energy required in the form of ATP and NADPH₂ are
(A) 2 ATP and 2 NADPH₂
(B) 5 ATP and 3 NADPH₂
(C) 3 ATP and 2NADPH₂
(D) 18 ATP and 12 NADPH₂

- 17 Beer-Lambert law applies in which of the following instrumentation technique?
(A) In spectroscopy to measure the degree of absorption of monochromatic light by homogenous mixture
(B) In atomic absorption spectrophotometry to identify elements
(C) HPLC to determine pressure for separation
(D) Ultra centrifuge machine to calculate rpm
- 18 In 2D PAGE second electrophoresis is done at which degree angle relative to the first one _____
(A) 60
(B) 180
(C) 90
(D) 30
- 19 Which is the first CO₂ acceptor enzyme in C₄ PLANTS?
(A) Rudp carboxylase
(B) Phosphoric acid
(C) Rubisco
(D) PEP-carboxylase
- 20 Which of the following is not true about Absorption spectroscopy?
(A) It involves transmission
(B) Scattering is kept minimum
(C) Reflection is kept maximum
(D) Intensity of radiation leaving the substance is an indication of concentration
- 21 Which of the following types of mutation is most likely to lead to premature termination of translation?
(A) Insertion of single base into DNA
(B) Deletion of three bases from DNA
(C) Deletion of an entire gene
(D) Single base change in a promoter.
- 22 Which of the following statements about restriction endonucleases is true?
(A) The enzymes are synthetic products for biotechnological applications.
(B) The enzymes cut DNA at defined sequences .
(C) The enzymes cut only single-stranded DNA molecules.
(D) The enzymes are named because they restrict the growth of bacteria.
- 23 What is meant by paralogous genes?
(A) Duplicated genes that have dissimilar sequence with some variation in function.
(B) Same genes that have similar sequence with some variation in function.
(C) Duplicated genes that have similar sequence and similar function.
(D) Duplicated genes that have similar sequence with some variation in function.
- 24 The enzyme Dicer is involved in which of the following processes?
(A) RNA synthesis
(B) RNA splicing
(C) Poly A addition to mRNA
(D) RNA interference

- 25 $500 \times g$, what does it represent in accordance to centrifugation?
- (A) Gravitational force
 - (B) Centrifugal force is 500 times greater than earthly gravitational force
 - (C) Centrifugal force is 500 times less than earthly gravitational force
 - (D) Centrifugal force is 100 times same as that of earthly gravitational force
- 26 What is Genome Database Mining?
- (A) Genome Database Mining refers to the searching of the nucleotide sequence databases.
 - (B) Genome Database Mining refers to the process of computational genome annotation by which uncharacterized DNA sequence is documented by the location along the DNA sequence involved in genome functionality.
 - (C) Genome Database Mining refers to the searching of the Protein sequence databases.
 - (D) Genome Database Mining refers to the searching of the classification databases.
- 27 What is expressed sequence tag?
- (A) A short strand of DNA that is a part of a cDNA molecule and can act as identifier of a gene. Used in locating and mapping genes
 - (B) The coding sequence or the portion of a nucleotide sequence that makes up the triplet codon that actually code for amino acids.
 - (C) Group of cloned (copied) pieces of DNA representing overlapping regions of a particular chromosome
 - (D) DNA that is synthesized in the laboratory from a messenger RNA template
- 28 Which of the following is most likely to be a conservative mutation?
- (A) CAA to TAA
 - (B) CCT to GCT
 - (C) ATC to GTC
 - (D) ATA to AAA
- 29 The meaning of ACCESSION NUMBER is
- (A) The accession number is the unique identifier assigned to the entire sequence record when the record is submitted to GenBank.
 - (B) The accession number is the unique identifier assigned to the entire sequence record when the record is submitted to Genome.
 - (C) The accession number is the common identifier assigned to the entire sequence record when the record is submitted to GenBank.
 - (D) The accession number is the unique identifier assigned to the entire site record when the record is submitted to GenBank.
- 30 A cDNA library contains clones representing which of the following?
- (A) mRNA
 - (B) Genomic DNA
 - (C) Introns
 - (D) Repeated DNA sequences
- 31 The splice donor is located
- (A) At the promoter
 - (B) At the 5' end of the intron
 - (C) At the branch point of the intron
 - (D) At the 3' end of the intron

- 32 Maximum recombination frequency between two genes is _____
- (A) 100%
 - (B) 75%
 - (C) 2%
 - (D) 50%
- 33 In which of the following the stage of meiosis I, crossing over takes place _____
- (A) Zygotene
 - (B) Diplotene
 - (C) Diakinesis
 - (D) Pachytene
- 34 All Phytohormones are heptane means
- (A) They are low molecular weight substances and non-immunogenic
 - (B) They are high molecular weight substances and immunogenic
 - (C) They are low molecular weight substances and immunogenic
 - (D) They are high molecular weight substances and non-immunogenic
- 35 Isoenzyme patterns of the proteins reveal that
- (A) Proteins are having same molecular weight but different functions
 - (B) Protein are having different functions and different molecular weight
 - (C) Proteins are having same function but different molecular weight
 - (D) Proteins have same functions and same molecular weight
- 36 Allels of the genes are found on
- (A) Homologous chromosomes
 - (B) Non homologous chromosomes
 - (C) Any chromosomes
 - (D) Same chromosome
- 37 Which of the following is not a staining method of SDS PAGE?
- (A) Silver staining
 - (B) Red Dye Staining
 - (C) Autoradiography
 - (D) Coomassie Blue Staining
- 38 Which of the following is not a type of Proteomics?
- (A) Structural Proteomics
 - (B) Functional Proteomics
 - (C) Expressional or Analytical Proteomics
 - (D) Transcription of codes for template
- 39 The primary nutrients of the plants are
- (A) Nitrogen, phosphorus and potassium
 - (B) Calcium, magnesium and sulphur
 - (C) Iron manganese and copper
 - (D) Zinc, boron, and molybdenum

- 40 In culture media, from the plant part callus induction takes place because
- (A) Dedifferentiation takes place due to shift in hormone concentrations
 - (B) In vitro, plant part first develop callus and then organogenesis
 - (C) Sucrose is added in the media instead of glucose
 - (D) Macronutrients in the media stimulate callus induction
- 41 Red Data Book provides information on
- (A) Endangered species
 - (B) Biota of red sea
 - (C) Effect of red light on photosynthesis
 - (D) Somaclonal variation of Red pigmented plants
- 42 Cryopreservation is carried out at
- (A) -10°C
 - (B) -50°C
 - (C) -100°C
 - (D) -196°C
- 43 The true difference between Phytohormones and plant growth regulators (PGRs) is
- (A) All PGRs are phytohormones but all Phytohormones are not PGRs.
 - (B) All Phytohormones are PGRs but all PGRs are not Phytohormones.
 - (C) All PGRs are proteins but Phytohormones are not proteins.
 - (D) All Phytohormones are proteins but all PGRs are not proteins.
- 44 The term Platome is used for _____
- (A) mtDNA
 - (B) cpDNA
 - (C) Nuclear DNA of the plant
 - (D) Total RNA of the plant
- 45 Which one is not the characteristic of Phytohormones
- (A) They are synthesized in low quantity
 - (B) They are protein molecules
 - (C) They have antagonistic effect
 - (D) They have synergistic effect
- 46 The TATA box is located in the
- (A) Splice enhancer
 - (B) Intron-exon border
 - (C) Promoter
 - (D) Poly-A addition site.
- 47 Extra chromosomal inheritance can be detected by
- (A) Back cross
 - (B) Reciprocal cross
 - (C) Test cross
 - (D) Dihybrid cross

- 48 Diploid maize have 10 chromosomes. Number of the chromosomes at metaphase I will be
(A) 10
(B) 20
(C) 30
(D) 40
- 49 Plant growing in cold environment generally have _____
(A) High cholesterol
(B) High saturated fatty acids
(C) High unsaturated fatty acids
(D) Short chain fatty acids
- 50 Which of the following distinguishes DNA from RNA?
(A) Presence of 3' deoxyribose in DNA, ribose in RNA
(B) Presence of uracil in RNA in place of thymidine in DNA
(C) Occurrence of base pairing in DNA but not RNA
(D) Presence of 5' phosphate in DNA but not RNA
- 51 Epinasty is an effect of _____
(A) Gibberellins
(B) Phytochrome
(C) Ethylene
(D) Cytochrome
- 52 Artificial seeds are _____
(A) Zygotic embryos encapsulated in a gel
(B) Seeds on capsulated in a gel
(C) Somatic embryos encapsulated in a gel
(D) Seeds produced in laboratory condition
- 53 A recombinant DNA molecule is produced by joining together
(A) One snRNA with a DNA segment
(B) Two mRNA molecules
(C) One mRNA with a tRNA segment
(D) Two DNA segments
- 54 First recombinant insulin was produced by using the plasmid _____
(A) pBR 322
(B) pUC 18
(C) ACY 17
(D) Ti plasmid
- 55 Rauwolfia serpentina, a plant under the threat of extinction can be saved by the technique
(A) Genetic engineering
(B) Hybridoma technology
(C) DNA finger printing
(D) In vitro culture

- 56 Restriction Endonuclease are
- (A) Endonucleases cut DNA at specific sites restriction
 - (B) Endonucleases cut DNA at random sites
 - (C) Endonucleases join DNA segments at specific sites
 - (D) Endonucleases join DNA at random sites
- 57 Mini satellites are _____
- (A) Short noncoding repetitive sequences present throughout the chromosomes
 - (B) Regions of Chromosomes after secondary construction
 - (C) 10-40 bp sized short sequences within the genes
 - (D) Short coding repetitive regions on the eukaryotic genome
- 58 VNTR is _____
- (A) Variable nucleotide triplet repeat
 - (B) Variable nucleoside triplet repeat
 - (C) Variable nucleoside tandem repeat
 - (D) Variable number of tandem repeats
- 59 SCID, a disease is due to the deficiency of
- (A) ADA enzyme
 - (B) Insulin
 - (C) Dystrophin
 - (D) Glucagon
- 60 "Golden rice" is named such as
- (A) it is made of gold
 - (B) it is obtained from areas where gold mining is done
 - (C) the seeds are golden yellow in colour because of the presence of β – carotene
 - (D) it contains traces of gold
- 61 Efficiency Index is which kind of growth rate _____
- (A) Absolute Growth Rate (AGR)
 - (B) Net Assimilation Rate (NAR)
 - (C) Crop Growth Rate (CGR)
 - (D) Relative Growth Rate (RGR)
- 62 Plants having solar- tracking mechanisms of bending towards sunlight is referred to as
- (A) Phototropism
 - (B) Heliotropism
 - (C) Photoperiodism
 - (D) Gravitropism
- 63 In which year the first clinical trials in humans using a plant derived vaccine was conducted _____
- (A) 1967
 - (B) 1997
 - (C) 1977
 - (D) 1987

- 64 The walls of the microtubules are formed from which protein?
(A) Actin
(B) Tubulin
(C) Pectin
(D) Hydroxyproline
- 65 In the enzymatic degradation of cell walls, some of the adjoining protoplasts may fuse to form _____
(A) Homokaryocytes.
(B) Haploid
(C) Eukaryocytes.
(D) Heterokaryocytes
- 66 Chloroplast genome is characterized by the presence of two
(A) Compound tandem arrays.
(B) Identical inverted repeats.
(C) Repeat interspersions.
(D) Simple tandem arrays
- 67 The enzyme which is used to release the individual cells from the leaf tissues is _____
(A) Chymotrypsin.
(B) Zymogen.
(C) Lysozyme.
(D) Macerozyme
- 68 Embryoids formed from the pollen grains in the tissue culture medium is due to
(A) Organogenesis
(B) Double fertilization
(C) Test tube culture
(D) Cellular totipotency
- 69 The compound used for the encapsulation of somatic embryos during synthetic seeds production

(A) Sodium acetate
(B) Sodium chloride
(C) Sodium alginate
(D) Sodium nitrate
- 70 Which of following is the main application of embryo culture?
(A) Clonal propagation
(B) Induction of somaclonal variations
(C) Production of embryoids
(D) Overcoming hybridisation barriers
- 71 Somaclones are
(A) Plants anatomically identical to the original plant
(B) Plants genetically identical to the original plant.
(C) Plants chemically identical to the original plant.
(D) Plants morphologically identical to the original plant.

- 72 Which of the following is not related to embryo culture?
- (A) Growth of embryos on culture medium.
 - (B) Multiplication of rare plants
 - (C) Making virus-free plants.
 - (D) Developing seedlings.
- 73 Girdling is involved in which method of plant propagation
- (A) Grafting
 - (B) Micropropagation
 - (C) Layering
 - (D) Cuttings
- 74 Cell fusion method involves the preparation of large number of _____
- (A) Plant cells with cell wall
 - (B) Single plant cell stripped of their cell wall
 - (C) Plant cells stripped of their cell wall
 - (D) Cells from different species
- 75 In culture media for micronutrient Zinc is used for
- (A) Protein synthesis
 - (B) Enzyme synthesis
 - (C) DNA replication
 - (D) Photosynthesis
- 76 A plasmid and an episome is differentiated as _____
- (A) Plasmid is circular, episome is linear.
 - (B) Plasmid can be insert into host genome, episomes are not
 - (C) Episome is circular, plasmid is linear.
 - (D) Episomes can be inserted into the host genome.
- 77 DNA staining is done by
- (A) Giemsa staining
 - (B) Crystal violet
 - (C) Methylene blue
 - (D) Feulgen staining
- 78 The colour of active form of phytochrome is
- (A) Blue
 - (B) Red
 - (C) Green
 - (D) Yellow
- 79 Oxidoreductases catalyse oxido-reductions between
- (A) Two substrates.
 - (B) Four substrates.
 - (C) Three substrates.
 - (D) Many substrates.

- 80 Which one of the following is the most common solidifying agent used in micropropagation?
- (A) Agar
 - (B) Dextran
 - (C) Dextrose
 - (D) Mannan
- 81 Cell culture in liquid agitated medium is called as
- (A) Liquid culture
 - (B) Micropropagation
 - (C) Agar culture
 - (D) Suspension culture
- 82 Best suited method for production of virus free plants is
- (A) Embryo culture
 - (B) Meristem culture
 - (C) Ovule culture
 - (D) Anther culture
- 83 The process of modification of exogenous compounds by plant cells is called
- (A) Biotransformation
 - (B) Bioconversion
 - (C) Both A and B
 - (D) Biophyto modification
- 84 Hairy root cultures for secondary metabolic production are induced by transforming plant cells with
- (A) Virus
 - (B) *Bacillus thuringiensis*
 - (C) *Agrobacterium tumefaciens*
 - (D) *Agrobacterium rhizogenes*
- 85 Genome of an organism refers to its total
- (A) Haploid DNA
 - (B) Number of proteins
 - (C) Number of chromosomes
 - (D) Number of genes
- 86 Which one of the following vitamins is used in PTC medium?
- (A) Pyridoxine
 - (B) Vitamin A
 - (C) Vitamin C
 - (D) Biotin
- 87 LINES stand for _____ nuclear Elements.
- (A) Long Interspersed
 - (B) Large Interspersed
 - (C) Long Interpierced
 - (D) Large Interpierced

- 88 Small excised portion of the _____ is used to produce mass of cells.
- (A) Callus
 - (B) Explant
 - (C) Totipotent
 - (D) Fragments
- 89 Ethylene production is inhibited by antisense gene _____.
- (A) Glyphoshate
 - (B) ACC synthase
 - (C) ACC synthetase
 - (D) Lyase
- 90 Fe- protein a part of nitrogenase enzyme can also be called as _____.
- (A) Dinitrogen reductase
 - (B) Dinitrogenase
 - (C) Reductase
 - (D) Dinitrogen
- 91 Production of adventitious roots and shoots from cells of tissue culture is termed as _____
- (A) Organogenesis
 - (B) Micropropagation
 - (C) Suspension culture
 - (D) Callus culture
- 92 Two or more adjoining somatic protoplasts fusing with any chemical is called as _____ fusion
- (A) protoplast
 - (B) induced
 - (C) spontaneous
 - (D) somatic cell
- 93 _____ is the genetic variability regenerated in tissue culture.
- (A) Somoclonal variation
 - (B) Micropropagation
 - (C) Organogenesis
 - (D) Androgenesis
- 94 Which one serves as a marker for mapping a specified gene in RFLP?
- (A) DNA
 - (B) tRNA
 - (C) rRNA
 - (D) mRNA
- 95 The process of _____ involves the introduction of a gene into a cell where it exchanges places with its counterpart in the host cell.
- (A) Knockout technology
 - (B) Gene targeting
 - (C) Transgenic technology
 - (D) Recombinant DNA technology

- 96 _____ marker is a DNA sequence in the genome that can be located and identified
- (A) Molecular
 - (B) Physical
 - (C) Biochemical
 - (D) Genetic
- 97 Growth, metabolism and _____ of cultured cells are influenced by plant growth regulators.
- (A) Differentiation
 - (B) Duplication
 - (C) Elongation
 - (D) Enlargement
- 98 A toxin obtained from which one of the following can ingest transgenic potatoes _____.
- (A) E. coli.
 - (B) Bacillus sp.
 - (C) Staphylococcus sp.
 - (D) Streptococcus sp.
- 99 The vector that could be used in two different systems/ hosts are called?
- (A) Phagemids
 - (B) Cosmids
 - (C) Shuttle vectors
 - (D) Plasmids
- 100 The transfer DNA (T-DNA) portion of Ti plasmid contains genes for?
- (A) Virulence and hormones
 - (B) Opines and Virulence
 - (C) Virulence and CDK
 - (D) Hormones and Opines
- 101 The water quality is categorized "Excellent" for irrigation when the chloride concentration (in meq l-1) is?
- (A) Less than 4
 - (B) 07-12
 - (C) 04-07
 - (D) Above 12
- 102 In hydrolysis of urea to CO_2 and NH_4^+ , which of the following elements is an essential part of urease?
- (A) Boron
 - (B) Zinc
 - (C) Copper
 - (D) Nickel
- 103 The linking number (L) of a supercoiled duplex DNA can be equated to its Twist (T) and Writhe (W) by which one of the following expression?
- (A) $L = T + W$
 - (B) $L = T/W$
 - (C) $L = T - W$
 - (D) $L = T \times W$

- 104 Which of the following amino acids in peptides are well suited for buffering the physiological pH?
- (A) Histidine
 - (B) Glycine
 - (C) Tryptophan
 - (D) Cysteine
- 105 The 14-3-3 proteins are involved in the post-translational regulation of which one of the following enzymes of nitrogen metabolism?
- (A) Nitrite reductase
 - (B) Nitrate reductase
 - (C) Nitrogenase
 - (D) Glutamine synthetase
- 106 In general, the depth of irrigation water needed per irrigation to irrigate 1 meter depth of clay loam soil profile at 50% soil-moisture availability is?
- (A) 120-140 mm
 - (B) 45-80 mm
 - (C) 80-120 mm
 - (D) 20-30 mm
- 107 Which component of water potential contributes in diffusion of water into the protoplasm of plant cells?
- (A) Matric potential
 - (B) Pressure potential
 - (C) Solute potential
 - (D) Gravitational potential
- 108 What single feature is probably most responsible for the success of angiosperms?
- (A) Seeds
 - (B) Fruit
 - (C) Broad leaves
 - (D) Flowers
- 109 Auxanometer is used to measure the
- (A) Respiratory activity
 - (B) Photosynthetic activity
 - (C) Growth activity
 - (D) Osmotic pressure
- 110 Gypsum is beneficial for
- (A) Phosphorus enriched soil
 - (B) Water logged soil
 - (C) Alkaline soil
 - (D) Saline soil
- 111 Triticale is derived by crossing
- (A) Wheat and rice
 - (B) Wheat and tapioca
 - (C) Rye (secale) and wheat
 - (D) Rye and rice

- 112 In photosynthesis, the ratio of O₂ to CO₂ liberated is
(A) 01:01
(B) 02:01
(C) 01:02
(D) 03:01
- 113 Probiotics are _____
(A) Cancer inducing microbes
(B) Sage antibiotics
(C) Food allergens
(D) Live microbial food supplements
- 114 Main carbon source in PTC is
(A) Sucrose
(B) Mannose
(C) Glucose
(D) Lactose
- 115 Evan's blue dye stains the _____ cells.
(A) Dead
(B) Live
(C) Dividing
(D) Expanding
- 116 Cytoplasmic hybrids refer to
(A) Cytoplast
(B) Chloroplast
(C) Tonoplast
(D) Protoplast
- 117 Cellulolysin is obtained from
(A) *Trichoderma viride*
(B) *Aspergillus species*
(C) *Irpex lactus*
(D) *Rhizopus species*
- 118 The dead protoplasts can be stained by
(A) Trypan blue.
(B) Fluorescein.
(C) Phenosafranine.
(D) Evans blue.
- 119 Which one of the following technique is mostly confined to protoplasts that can be regenerated to viable plants?
(A) Electroporation.
(B) Biolistic method.
(C) Silicon carbide fibres.
(D) Microinjection

- 120 The function of “low-copy-number DNA” is encoded in
(A) tRNA.
(B) Most genes.
(C) A single gene.
(D) rRNA.
- 121 Traditionally there are types of restriction enzyme
(A) 3
(B) 2
(C) 5
(D) 4
- 122 Which type of restriction enzyme is independent of its methylase?
(A) Type III.
(B) Type II.
(C) Type I.
(D) Type IV.
- 123 CRISPR-Cas9 is a genetic molecular tool which is used in
(A) DNA coding
(B) RNA coding
(C) Gene editing
(D) Gene multiplication
- 124 Disarming of Ti plasmid is
(A) Removal of the Virulence region
(B) Removal of the 25 base pair repeats
(C) Removal of the T-DNA
(D) Removal of the Host specificity region
- 125 The Ti cloning vector pBIN19 contains which of the following genes?
(A) Stress resistant gene
(B) Tetracycline resistant gene
(C) Kanamycin resistant gene
(D) Ampicillin resistant gene
- 126 Which of the following genes are constitutively expressed and control the plant induced activation of other vir genes?
(A) vir A and vir G
(B) vir B and vir E
(C) vir C and vir D
(D) vir A and vir B
- 127 What is Dimethyl sulfoxide used for?
(A) A gelling agent
(B) Chelating agent
(C) Cryoprotectant
(D) An Alkylating agent

- 128 Cybrids are produced by
(A) The nucleus of one species but cytoplasm from both the parent species
(B) The fusion of two different nuclei from different species
(C) The fusion of two same nuclei from the same species
(D) The nucleus of both species but cytoplasm from single parent species
- 129 RFLP is used to identify
(A) Specific DNA
(B) Specific protein
(C) Both DNA and RNA
(D) Specific RNA
- 130 A genetically engineered microbes used successfully in bioremediation of oil spills
(A) Trichoderma
(B) Pseudomonas
(C) Bacillus
(D) Xanthomonas
- 131 Which of the following is the correct sequence in taxonomic hierarchy?
(A) Division, Family, Class, Order
(B) Class, Order, Family, Genus
(C) Order, Class, Genus, Family
(D) Genus, Species, Family, Class
- 132 Chlorophyll is not formed without
(A) potassium
(B) magnesium
(C) calcium
(D) iron
- 133 A taxon is
(A) a group of related families
(B) a group of related species
(C) a type of living organisms
(D) a taxonomic group of any ranking
- 134 Most frequent method for plant pathogen identification is
(A) LC-MS
(B) ELISA
(C) Centrifugation
(D) Chromatography
- 135 The disease resistant variety Scarlet is
(A) Sweet potato
(B) Tobacco
(C) Carnation
(D) Cotton

- 136 Holiday junction is observed during
(A) Recombination
(B) Mutation
(C) Replication
(D) DNA repair
- 137 The unit of chromatin is
(A) Chromosome
(B) Chromonemata
(C) Nucleosomes
(D) Nucleotides
- 138 Chloroplast and mitochondria in higher plants
(A) Found within nucleus
(B) Have linear DNA molecule
(C) Carry extra nuclear genes
(D) Are inherited by both the parents
- 139 For cell elongation which Phytohormones are needed
(A) Auxin and Cytokinin
(B) Auxin and gibberellins
(C) ABA and Auxin
(D) ABA and ethylene
- 140 Cut or excised leaves remain green for long if induced to root or dipped in
(A) Gibberellins
(B) Cytokinins
(C) Auxins
(D) Ethylene
- 141 The term 'Okazaki Segment' is used for:
(A) DNA segment involved in recombination
(B) DNA segment involved in transcription
(C) Chain of nucleotides formed during replication
(D) RNA molecules that helps in translation
- 142 The substrate for photorespiration is
(A) Phosphoglyceric acid
(B) Glycolate
(C) Serine
(D) Glycine
- 143 Which one among the following chemicals is used for causing defoliation of forest trees?
(A) Malic hydrazide
(B) 2, 4-d
(C) Amo-1618
(D) Phosphon d

- 144 Which one of the following enzyme commonly use in ELISA technique
- (A) DNA dependent RNA polymerase
 - (B) DNA polymerase –II
 - (C) Peroxidase
 - (D) Helicase
- 145 Which one of the following is sequencing gel for DNA?
- (A) SDS-PAGE
 - (B) Urea-PAGE
 - (C) Native PAGE
 - (D) Agarose
- 146 Kranz anatomy is typical of _____
- (A) C4 plants
 - (B) C3 plants
 - (C) C2 plants
 - (D) CAM plants
- 147 Removal of apical bud results in _____
- (A) Formation of new apical bud
 - (B) Elongation of main stem
 - (C) Death of plant
 - (D) Formation of lateral branching
- 148 Which genetic marker is observed in high frequency from the following?
- (A) AFLP
 - (B) SNP
 - (C) SSR
 - (D) ISSR
- 149 Which one from the following is in patent criteria?
- (A) Logo of institute
 - (B) Book of a scientist
 - (C) Software development
 - (D) Novel procedure to remove pest
- 150 Which of the following is not an important criteria of a product/process to be patented?
- (A) Novelty
 - (B) Inventive step
 - (C) Industrial Applicability
 - (D) Discovery
- 151 In soil, water available for plants is
- (A) Gravitational water
 - (B) Chemically bound water
 - (C) Capillary water
 - (D) Hygroscopic water

- 152 Viable protoplast can be screen by
- (A) Centrifugation
 - (B) Electron microscopy
 - (C) Applying vital stains
 - (D) Using specific antibody
- 153 If one starts a polymerase chain reaction with a single copy of a DNA sequence, approximately how many copies will be present after 10 cycles of amplification?
- (A) 10
 - (B) 1,000
 - (C) 10,000
 - (D) 100,00
- 154 Which of the following is used as a media for density gradient?
- (A) Agarose
 - (B) Ficoll
 - (C) Luria broth
 - (D) Propylene glycol
- 155 What is PyMOL?
- (A) Pyrated Molecular tool
 - (B) Python based Visualization tool
 - (C) Program to find conserved motifs in proteins
 - (D) A software suite for DNA sequence analyses
- 156 What are UTRs?
- (A) Unidentified Regions
 - (B) Untranslated Regions
 - (C) Undifferentiated Regions
 - (D) Untranscribed Regions
- 157 DEAE-cellulose is use in
- (A) Paper chromatography
 - (B) Ion-exchange chromatography
 - (C) HPLC
 - (D) Gas chromatography
- 158 The GenBank accession number is written in which formats out of below?
- (A) M12345@
 - (B) M: 12345
 - (C) M12345
 - (D) M-12345
- 159 In which marker technique, complementary to RE sites adaptors are used?
- (A) RFLP
 - (B) RAPD
 - (C) SSR
 - (D) AFLP

- 160 In which one of the following status hormones are not observed in the plant cell _____
- (A) Oxidative
 - (B) Conjugated
 - (C) Free
 - (D) Doubled membrane
- 161 Which one of the following plant has smallest genome
- (A) Cotton
 - (B) Groundnut
 - (C) Arabidopsis
 - (D) Red wood tree
- 162 Transcriptomics includes
- (A) Studies of translated proteins
 - (B) Studies of coding DNA molecules
 - (C) Studies on mRNA of the organism
 - (D) Studies on structural and functional differences in the genomes
- 163 Richmond and Lang effect is demonstrated by using
- (A) Cytokinin
 - (B) Gibberellins
 - (C) ABA
 - (D) Ethylene
- 164 Edible part of mango is
- (A) Endocarp
 - (B) Epicarp
 - (C) Mesocarp
 - (D) Receptacle
- 165 Which one is a common scientific problem in herbal formulation?
- (A) Adulteration
 - (B) Marketing of the goods
 - (C) Seasons for preparation
 - (D) Availability of formulations
- 166 The main function of ozone layer is
- (A) To protect from UV rays
 - (B) Maintain global temperature
 - (C) Global warming
 - (D) Absorption of cosmic rays
- 167 Dendrogram is
- (A) Arrangement of the chromosomes
 - (B) Graphical representation of the phylogenetic tree
 - (C) Taxonomic key to understand relationship
 - (D) Evolutionary time scale representation

- 168 Among the following which mineral play key role in photolysis of water
- (A) Mg⁺⁺
 - (B) Mn⁺⁺
 - (C) Ca⁺⁺
 - (D) Na⁺⁺
- 169 A gene from one organism joined to the regulatory sequence of another gene by recombinant DNA technology is called as
- (A) Housekeeping gene
 - (B) Junk gene
 - (C) Chimeric gene
 - (D) Oncogene
- 170 Humulin, an insulin was produced for the first time by
- (A) Biocon India Limited
 - (B) Cipla
 - (C) Eli Lilly and Company
 - (D) Glaxo
- 171 Noble prize was given to which scientists for discovery of Restriction endonucleases
- (A) Jacob and Monad
 - (B) Smith, Nathans and Arber
 - (C) Alec Jaffreys and Milstein
 - (D) Watson and Crick
- 172 A omega – 9 fatty acid is
- (A) Erucic acid
 - (B) Palmitoleic acid
 - (C) Eicosapentenoic acid
 - (D) Gamma-Linolenic acid
- 173 The newly formed cell walls take which stain
- (A) Evans blue
 - (B) Calcofluor white
 - (C) Phenosafranine
 - (D) Fluorescein
- 174 First man made cereal i.e. Triticale is an example of
- (A) Artificial allopolyploidy
 - (B) Artificial autopolyploidy
 - (C) Artificial evolution
 - (D) Man-made crossing
- 175 Which of the following scientist was not responsible for developing somatic hybrids?
- (A) Halperin
 - (B) Steward
 - (C) Wetherell
 - (D) Skoog

- 176 The function of using Activated charcoal in nutrition media is to
- (A) Absorb toxic substances
 - (B) Absorb elements
 - (C) Absorb microbes
 - (D) Absorb moisture
- 177 Which is maize protein?
- (A) Gluten.
 - (B) Oryzein.
 - (C) Glycin.
 - (D) Zein.
- 178 Which one of the following is not a plant derived elicitor?
- (A) Chitin
 - (B) Pectin
 - (C) Cellulose
 - (D) Pectic acid
- 179 The type of culture technique is used for the development of anthers is?
- (A) Anther
 - (B) Callus
 - (C) Pollen
 - (D) Embryo
- 180 Which of the following crop plant is tolerant to available iron in soils?
- (A) Guava
 - (B) Sugarbeet
 - (C) Citrus
 - (D) Brinjal
- 181 'Rainbow' a transgenic papaya variety is resistant to _____
- (A) PRSV
 - (B) Fruit rot
 - (C) Aphids
 - (D) Delayed fruit ripening
- 182 The colour of flower is due to the presence of _____
- (A) Chlorophyll
 - (B) Xanthophylls
 - (C) Florigen
 - (D) Chromoplast or anthocyanin
- 183 What are the names of the two genders of haploid yeast cells?
- (A) A and Alpha
 - (B) M and F
 - (C) Y(A) and Y(B)
 - (D) None of these

- 184 Glyphosate is a derivative of which amino acid?
(A) Alanine
(B) Serine
(C) Valine
(D) Glycine
- 185 Which plants can be developed from ovary culture?
(A) Dicot
(B) Haploid
(C) Monocot
(D) Diploid
- 186 Lepidoptera refers to
(A) Bollworms
(B) Aphids
(C) Grasshopper
(D) Beetles
- 187 In which of the following conditions do the somaclonal variations appear?
(A) Plants raised in tissue culture
(B) Plants growing in polluted soil or water
(C) Plants exposed to gamma rays
(D) Plants transferred by a recombinant DNA technology.
- 188 Monoclonal antibodies obtained from
(A) Many parents and for many antigens
(B) One parent and for one antigen
(C) Different parent and for one antigen
(D) One parent and for many antigen
- 189 Secondary metabolites are produced by using
(A) Axillary buds
(B) Protoplast
(C) Meristem
(D) Cell suspension
- 190 Urea and Formamide can:
(A) Helps faster re-annealing of DNA
(B) Decrease the T_m of DNA
(C) Increase T_m of DNA
(D) Does not affect denaturation of DNA
- 191 Unique feature of Taq polymerase due to which it is used in PCR is
(A) High speed
(B) Low thermal stability
(C) High thermal stability
(D) High fidelity

- 192 Brassinolide was isolated from pollen of
(A) Brassica napus.
(B) Brassica oleracia.
(C) Brassica capitata.
(D) Brassica rapa
- 193 All are plant derived alkaloids except
(A) Menthol
(B) Nicotine
(C) Codeine
(D) Quinine
- 194 A gene product can be best detected by technique
(A) Dot blotting
(B) Plaque blotting
(C) Western blotting
(D) Southern blotting
- 195 Which technique is suitable to identify mRNA molecules in a sample ?
(A) Eastern blotting
(B) Southern blotting
(C) Northern blotting
(D) Western blotting
- 196 Growth, metabolism and _____ of cultured cells are influenced by plant growth regulators.
(A) Differentiation
(B) Duplication
(C) Elongation
(D) Enlargement
- 197 In general, the depth of irrigation water needed per irrigation to irrigate 1 meter depth of clay loam soil profile at 50% soil-moisture availability is?
(A) 120-140 mm
(B) 45-80 mm
(C) 80-120 mm
(D) 20-30 mm
- 198 In vitro 'slow growth culture' method is used for
(A) Induction of somaclonal variation
(B) Conservation of plant genetic resources
(C) Genetic transformation
(D) Elimination of latent contamination
- 199 In the light microscope which part controls the intensity of light entering the viewing area?
(A) Fine adjustment screw
(B) Condenser lens
(C) Coarse adjustment screw
(D) Diaphragm

200

What is domain?

- (A) It is non protein part of enzyme
- (B) It is cofactor binding site
- (C) It coenzyme binding site
- (D) It is active site of enzyme

Plant Biotechnology
Provisional Answer Key

Q.No	Option	Q.No	Option	Q.No	Option	Q.No	Option
1	A	51	C	101	A	151	C
2	D	52	C	102	D	152	C
3	B	53	D	103	A	153	B
4	C	54	A	104	A	154	B
5	A	55	D	105	B	155	B
6	B	56	A	106	C	156	B
7	C	57	A	107	B	157	B
8	B	58	D	108	D	158	C
9	D	59	A	109	C	159	D
10	A	60	C	110	C	160	D
11	B	61	D	111	C	161	C
12	D	62	B	112	A	162	C
13	B	63	B	113	D	163	A
14	C	64	B	114	A	164	A
15	A	65	A	115	A	165	A
16	C	66	B	116	A	166	A
17	A	67	D	117	A	167	C
18	C	68	D	118	C	168	B
19	D	69	C	119	A	169	C
20	C	70	D	120	B	170	C
21	A	71	B	121	D	171	B
22	B	72	C	122	B	172	A
23	D	73	C	123	C	173	B
24	B	74	B	124	C	174	A
25	B	75	D	125	C	175	D
26	B	76	D	126	A	176	A
27	A	77	D	127	C	177	D
28	C	78	A	128	A	178	A
29	A	79	A	129	A	179	A
30	A	80	A	130	B	180	B
31	B	81	D	131	B	181	A
32	D	82	B	132	B	182	D
33	D	83	C	133	D	183	A
34	A	84	D	134	B	184	D
35	C	85	A	135	A	185	B
36	A	86	A	136	A	186	A
37	B	87	A	137	C	187	A
38	D	88	B	138	C	188	C
39	A	89	B	139	B	189	D
40	A	90	B	140	B	190	B
41	A	91	A	141	C	191	C
42	D	92	B	142	B	192	A
43	B	93	A	143	B	193	A
44	B	94	A	144	C	194	C
45	B	95	B	145	B	195	C
46	C	96	A	146	A	196	A
47	B	97	A	147	D	197	C
48	B	98	A	148	B	198	B
49	C	99	C	149	D	199	D
50	B	100	D	150	D	200	D