PREVIOUS QUESTIONS PAPERS
DU MSC PLANT MOLECULAR BIOLOGY N BIOTECHNOLOGY (2018)

1. Which of the following microscopy techniques is used for live cell imaging?
   (a) Scanning electron microscopy (b) Atomic force microscopy
   (c) Phase contrast microscopy (d) Transmission electron microscopy
2. Which of the following is a selection marker gene?
   (a) nptII (b) gfp (c) Luciferase (d) gus
3. Which of the following enzyme is not heat tolerant?
   (a) Pfu DNA polymerase. (b) E. coli DNA polymerase
   (c) Taq DNA polymerase. (d) Deep Vent DNA polymerase.
4. Central Soil and Materials Research Station is located in
   (a) Mohali. (b) Chandigarh. (c) Panipat. (d) New Delhi.
5. Topoisomerases are involved in determining
   (a) toplogy of translating mRNA. (b) supercoiling of DNA.
   (c) binding of histones to DNA. (d) the structure of telomeres.
6. Cotton belongs to the family
   (a) Anacradiaceae (b) Malvaceae (c) Brassicaceae (d) Solananceae
7. Epiphytic orchid roots are a form of
   (a) parasitic roots. (b) prop roots. (c) aerial roots. (d) storage roots.
8. 2,4-D is commercially used as a
   (a) pesticide. (b) herbicide. (c) florigen. (d) fungicide.
9. Haber-Bosch made a significant contribution in the synthesis of which of the following chemical compounds?
   (a) Silver chloride (b) Mercuric oxide (c) Sulphur dioxide (d) Ammonia
10. The width of DNA is
    (a) 2 nm. (b) 200 Angstrom. (c) 3.4 nm. (d) 0.34 fm.
11. The gritty texture in Pears is due to
    (a) collenchyma. (b) pits. (c) tracheids. (d) sclereids.
12. Which coenzyme is required for reduction of glutathione?
    (a) NADPH (b) FAD (c) FMN (d) NADH
13. Which country is the largest producer of chickpea?
    (a) Egypt (b) Turkey (c) India (d) Israel
14. Which country is the largest producer of wheat?
    (a) Mexico (b) USA (c) India (d) China

15. QTL represents following:
    (a) Qualitative trait locus (b) Quantitative trade locus
    (c) Quantitative trait locus (d) Quantitative test locus
16. The genetic term 'LOD Score' is related to
    (a) Gene linkage. (b) Gene mutation.
    (c) Gene dominance. (d) Epistasis.
17. The genome sequencing of which of the plant was carried out first?
    (a) Wheat (b) Tomato (c) Arabidopsis (d) Rice
18. The popular molecular biology abbreviation NGS stands for
    (a) Next Generation Sequencing. (b) Next Generation Synthesis.
    (c) Novel Gene Sequences. (d) New Gene Sequences.
19. Root hairs are found in which of the following areas?
    (a) Root cap (b) Zone of cell elongation
    (c) Zone of cell division (d) Zone of cell maturation
20. Yeast one-hybrid assay is employed to study interaction between
    (a) protein and protein. (b) DNA and DNA.
    (c) DNA and proteins. (d) DNA and RNA.
21. Anthropogenic extinction occurs due to
    (a) floods. (b) tectonic shifts. (c) earthquakes. (d) human activities.
22. In an experiment, cell culture was supplied with 35S radioisotope to label the newly synthesized peptides. Among the following which peptide will be labelled?
    (a) Glycine-Cysteine-Valine-Proline (b) Tryptophan-Serine-Threonine-Histidine
    (c) Arginine-Glycine-Tryptophan-Proline. (d) Isoleucine-Valine-Tyrosine-Tryptophan
23. Opening and closing of the stomata in plants is mainly regulated by
    (a) Na^+ channel. (b) HCO^{3-} channel. (c) K^+ channel. (d) NO^{3-} channel.
24. Which plant organelle exhibit highest acid phosphatase activity?
    (a) Nuclei (b) Mitochondria (c) Peroxisomes (d) Vacuoles
25. Which part of the plants is least likely to be infected by viruses?
    (a) Shoot meristem (b) Flowers (c) Crown tissue. (d) Leaves
26. A nonsense mutation involves
    (a) a nucleotide substitution that creates a stop codon in a gene.
    (b) a nucleotide substitution which adds an extra start codon.
    (c) a mutation which makes no change in the amino acid sequence.
    (d) a mutation which subsitutes only one amino acid in a protein.
27. The primary walls of endodermis are impregnated with
    (a) lignin. (b) proteins. (c) suberin. (d) wax.
28. In the context of bacteriophage lambda, lysogeny indicates a stage where
    (a) the bacteriophage DNA gets integrated into the bacterial chromosome.
    (b) the bacteria form large colonies.
    (c) multiple copies of bacteriophages are formed.
    (d) there is rapid lysis of bacteria.

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29. 'Teosinte' is the progenitor of which of the following crops?
(a) Maize (b) Rice (c) Barley (d) Wheat

30. Carbohydrates are present in the plasmalemma as
(a) glycolipids. (b) hemicellulose. (c) cellulose. (d) starch.

31. Plasma membrane of a plant cell consists of
(a) carbohydrate, protein and esters.
(b) phospholipids and proteins.
(c) lipids, acid and base.
(d) free fatty acid, steroids and proteins.

32. Nucleosome is involved in
(a) DNA packaging.
(b) RNA packaging.
(c) DNA recombination.
(d) Protein transport.

33. In higher plants, the shape of the chloroplast is
(a) cup-shaped. (b) girdle-shaped. (c) ribbon-shaped. (d) discoid.

34. The molecular biology term EST stands for
(a) Exon Sequencing Technique.
(b) Eukaryotic Sequenced Tag.
(c) Expressed Sequenced Tag.
(d) Express Sequencing Technique.

35. The longest cell in the human body is
(a) muscle cell. (b) heart cell. (c) bone cell. (d) nerve cell.

36. The smallest amino acid is
(a) isoleucine. (b) valine. (c) glycine. (d) alanine.

37. Cell elongation in intermodal regions in green plants takes place due to
(a) ethylene. (b) gibberellins. (c) cytokinins. (d) indole acetic acid.

38. In which sport, the Indian team won Gold medal for the first time in 2018 Commonwealth Games?
(a) Women Cricket
(b) Women Hockey
(c) Women Table Tennis
(d) Women Basketball

39. The Nobel Prize in the field of medicine/physiology 2017 was awarded for the discovery of molecular mechanism controlling
(a) circadian rhythm. (b) gene silencing. (c) autophagy. (d) innate immunity.

40. Name the only common amino acid having an ionisable side chain with a pKa near neutrality:
(a) Histidine (b) Glycine (c) Valine (d) Aspartic acid

41. Name the enzyme of TCA cycle which uses FAD as a cofactor:
(a) Citrate synthase
(b) Isocitrate dehydrogenase
(c) Succinate dehydrogenase
(d) Alpha ketoglutarate dehydrogenase

42. What is maximum resolving power of light microscope?
(a) 2.0 μm (b) 0.1 μm (c) 0.2 μm (d) 1.0 μm

43. 'Norin 10' is a cultivar of
(a) rice. (b) wheat. (c) maize. (d) sorghum.

44. The concept of 'Totipotency' was given by
(a) T. Murashige. (b) P. Maheshwari. (c) E.C. Cocking. (d) G. Haberlandt.

45. Brown mustard is
(a) Brassica juncea.
(b) Brassica nigra.
(c) Brassica carinata.
(d) Brassica napus.

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46. When a plant cell is shifted from an isotonic to a hypotonic solution, the cell will
(a) die. (b) swell. (c) shrink. (d) not change in size.

47. The repeating unit of glycogen is
(a) galactose. (b) mannose. (c) glucose. (d) fructose.

48. In dicots, primary growth is initiated by the
(a) vascular cambium.
(b) intercalary meristems.
(c) apical meristems.
(d) lateral meristems.

49. Isoschizomers are the restriction endonucleases that have
(a) different recognition and cleavage sites.
(b) different recognition and similar cleavage sites.
(c) same recognition and cleavage sites.
(d) same recognition and different cleavage sites.

50. Moss peat is used for transportation of live plant material because
(a) it is hygroscopic.
(b) it is easily available.
(c) it serves as a disinfectant.
(d) it reduces transpiration.

51. IUPAC stands for
(a) International Union of Pure and Applied Chemistry.
(b) International Union of Primary and Applied Chemistry.
(c) Indian Union of Primary and Applied Chemistry.
(d) Indian Union of Pure and Applied Chemistry.

52. The number of amino acids in the protein translated from a 336 nucleotides long mRNA (including initiator and termination codon) is
(a) 109 (b) 112 (c) 110 (d) 111

53. Metabolomics is the study of the
(a) metagenome.
(b) entire suite of metabolites.
(c) proteins involved in metabolism.
(d) enzymes.

54. The office of the Indian National Science Academy is located at
(a) Allahabad. (b) New Delhi. (c) Hyderabad. (d) Bengaluru.

55. Which of the amino acids is precursor for ethylene?
(a) Glycine (b) Cysteine (c) Tryptophan (d) Methionine

56. Seymour Benzer carried out fine structure mapping of rII gene of bacteriophage T4 by
(a) DNA sequencing of mutant bacteriophages.
(b) 2D gel electrophoresis of bacteriophage proteins.
(c) recovery of wild type bacteriophages from crosses of mutant phages.
(d) transcript analysis of mutant bacteriophages.

57. Coiling of garden pea tendrils around a support is an example of
(a) thigmonasty. (b) thigmotropism. (c) thigmotaxis. (d) thermotaxis.

58. Who discovered the principle of confocal microscopy?
(a) Georges Nomarsky
(b) Ernest Abbe
(c) Carl Zeiss
(d) Marvin Lee Minsky

59. cDNA is synthesized by
(a) RNA polymerase I.
(b) RNA polymerase II.
(c) RNA polymerase III.
(d) Reverse transcriptase.

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60. Which region of the visible spectrum is optimal for the light reaction of photosynthesis?
(a) Green and blue (b) Green and red (c) Violet and blue (d) Blue and red

61. The juvenile stage in mosses is
(a) prothallus. (b) capsule. (c) protonema. (d) sporophyte.

62. The main function of centrosome is
(a) secretion. (b) vesicle formation.
(c) protein synthesis. (d) formation of spindle fibres.

63. Galacturonic acid is predominant in
(a) chloroplast membrane. (b) glyoxysome.
(c) plasmamembrane. (d) cell wall.

64. What is the full form of HTML?
(a) Heavy Text Making Language (b) Heavy Text Markup Language
(c) Hyper Text Markup Language (d) Hyper Text Making Language

65. Which of the following is a synthetic cytokinin?
(a) Adenine (b) Kinetin (c) Zeatin (d) Isopentyl adenine

66. Which of the following is a viral promoter, active in plants?
(a) pActin (b) p35S-CaMV (c) pUbiquitin (d) pRbcS

67. Which of the following is a seed company?
(a) Bennett, Coleman & Co. Ltd. (b) Monsanto
(c) Biocon Ltd. (d) GlaxoSmithKline plc.

68. Which of the following books has been authored by Prof. P. Maheshwari?
(a) Basics of Plant Cell Biology
(b) The Flora of Delhi
(c) An Introduction to the Embryology of Angiosperms
(d) An Introduction to the Embryology of Gymnosperms

69. Which of the following assays does NOT require antibodies?
(a) Western analysis (b) Northern blotting (c) ELISA (d) ChIP

70. Which of the following enzymes is membrane bound?
(a) Citrate synthase (b) Isocitrate dehydrogenase
(c) Succinate dehydrogenase (d) Alpha ketoglutarate dehydrogenase

71. Which of the following enzymes is important for regeneration of NAD^+?
(a) Isocitrate dehydrogenase (b) Alcohol dehydrogenase
(c) Malate dehydrogenase (d) Alpha ketoglutarate dehydrogenase

72. Which of the following enzymes uses a sulphur-containing coenzyme?
(a) Citrate synthase (b) Isocitrate dehydrogenase
(c) Alpha ketoglutarate dehydrogenase (d) Pyruvate dehydrogenase

73. Which of the following is NOT an example of a lipid?
(a) Steroids (b) Fatty acids (c) Triglycerides (d) Glycosaminoglycan

74. Which of the following elements is present in both proteins and nucleic acids?
(a) Molybdenum (b) Nitrogen. (c) Sulphur (d) Magnesium

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75. Which of the following is a vitamin?
(a) Lauric acid (b) Folic acid (c) Citric acid (d) Phytic acid

76. Which of the following is a text-based database search engine?
(a) Phylip (b) FASTA (c) ENTREZ (d) BLAST

77. Which of the following activities is absent in bacterial DNA Polymerase I?
(a) 5'-3' exonuclease. (b) 3'-5' exonuclease.
(c) 3'-5' polymerase. (d) 5'-3' polymerase.

78. Which of the following is the main component of the commonly used household mosquitorepellant?
(a) Benzene (b) Pyrethrin (c) Pine oil (d) Phenol

79. Which of the following phenomena occurs in trp operon during "attenuation" in the presence of tRNAs charged with tryptophan?
(a) Failure to terminate at the stop codon
(b) Transcription initiation at the transcription start site
(c) Transcription termination at the leader sequence
(d) Recombination at the leader region

80. Which of the following crop genomes is the largest in size?
(a) Chickpea (b) Tomato (c) Rice (d) Wheat

81. Which of the following plants is a source of a common household Insecticide?
(a) Capsicum frutescens (b) Chrysanthemum cineraraefolium
(c) Digitalis lanata (d) Coleus blumei

82. Which of the following has a closed ring structure?
(a) b-carotene (b) Phytochrome (c) Chlorophyll (d) Phycobilin

83. Which of the following lipids are more suited for the function of energy storage?
(a) Phospholipids (b) Galactolipids (c) Triglycerides (d) Sphingolipids

84. Which one of the following is a Rabi crop?
(a) Rice (b) Mustard. (c) Pearl millet. (d) Sugarcane.

85. Which one of the following statements is NOT true?
(a) Tetrahymena mitochondrial DNA is linear in nature
(b) Higher plant mitochondrial DNA is circular in nature
(c) Plasmodium mitochondrial DNA is linear in nature
(d) Chlamydomonas mitochondrial DNA is circular in nature

86. Smooth endoplasmic reticulum is the site of
(a) protein synthesis. (b) amino acid synthesis.
(c) carbohydrate synthesis. (d) lipid synthesis.

87. Bacteriophages are
(a) fungi infected bacteria. (b) viruses infecting bacteria.
(c) bacteria which infect viruses. (d) bacteria infecting fungi.

88. Name two amino acids with net negative charge at pH 7.0:
(a) Aspartic acid and glutamic acid (b) Proline and histidine
(c) Glycine and valine (d) Lysine and Arginine

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89. Name two amino acids with positively charged R groups:
(a) Histidine and Lysine (b) Alanine and Proline
(c) Aspartic acid and Glutamic acid (d) Leucine and Valine

90. DNA binding sites of transcription factors in the promoters can be identified by
(a) yeast-2-hybrid analysis. (b) chromatin Immunoprecipitation.
(c) 5' RACE. (d) Southern blotting analysis.

91. ENCODE expands to
(a) Entire Compendium of DNA Elements. (b) Encyclopedia of DNA Elements.
(c) Encyclopedia of Disaster Estimates. (d) Encyclopedia of Disease Estimates.

92. The type I intermediate filament present in nail and hair is made of
(a) tubulins. (b) vimentins. (c) keratins. (d) lamins.

93. Who was the governor of Reserve Bank of India at the time of demonetization?
(a) D. Subbaroa (b) Y. V. Reddy (c) Urjit R. Patel (d) Raghuram Rajan

94. Who was given Nobel Prize for discovery of restriction enzymes?
(a) A. Klug (b) W. Arber (c) P. Berg (d) F. Sanger

95. A technique of using very small metal particles coated with desired gene in the gene transfer is called
(a) microinjection. (b) biolistics. (c) lipofection. (d) electroporation.

96. EcoRI recognizes six bases to make a cut in DNA. In a large genome, what would be the expected frequency of occurrence of the recognition site?
(a) 16384 bp (b) 24 bp (c) 1024 bp (d) 4096 bp

97. The DNA:protein ratio in eukaryotic chromatin is
(a) 4:1 (b) 2:1 (c) 1:2 (d) 3:1

98. Which has the largest genome size amongst the following?
(a) Human (b) Mouse (c) Rice (d) Wheat

99. Who is the current chief of Indian Air Force?
(a) Birender Singh Dhanoa (b) Bikram Singh (c) Dalbir Singh (d) V. K. Singh

100. You are required to prepare 3M sodium chloride solution (NaCl) for a molecular biology experiment. The atomic number of Na-11, Cl-17 and atomic weight of Na-23, Cl-35.5. How much NaCl salt would you weigh for preparing 100 ml solution?
(a) 8.4 g (b) 2.8 g (c) 5.85 g (d) 17.55 g

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