MSc(HS/2Yr)(Biotechnology)

1. This technique for separation of charged molecules based on varying rates of migration through a solid matrix when subjected to an electric field is known as

A) Autoradiography B) Spectrophotometry
C) Electrophoresis D) Blotting

2. Which of the following is an example of incomplete dominance?

A) AB blood group B) Mirabilis jalapa
C) Shape of crown in poultry D) Mouse coat colour

3. GRAIL is an example of a type of algorithm used for searching genes in DNA sequence

A) Neural network B) Rule based system
C) Hidden markov model D) Wide network

4. What is an apoenzyme?

A) It is a non-protein group
B) It is a protein portion of an enzyme
C) It is a complete, biologically active conjugated enzyme
D) It is a prosthetic group

5. Name the acid present in the cell wall of bacteria which helps in retaining its color during the acid-fast test?

A) Malic acid B) Teichoic acid C) Mycolic acid D) Tartaric acid

6. What is the unit of a genetic map?

A) Nanometer B) Centimeter C) Angstrom D) Centimorgan

7. . ……bond is used to stabilize the double helix of DNA.

A) Hydrogen bond B) Hydrophobic bond
C) Ionic bond D) Covalent bond

8. Which technique is used for the amplification of random DNA sequences from any species by the use of a single primer?

A) RFLP B) RAPD C) SSLP D) AFLP

9. When mammalian cells are irradiated, they stop dividing and arrest at a G1 checkpoint. Place the following events in the order in which they occur.

i) Production of p21

ii) DNA damage

iii) Inactivation of cyclin-Cdk complex

iv) Activation of p53

A) i, ii, iii, iv B) iv, iii, ii, I C) iii, ii, i, iv D) ii, iv, i, iii

10. Which of the following methods could provide structural information regarding the secondary structures of a protein?

A) Mass spectrometry B) Circular dichroism spectroscopy

C) Visible light spectroscopy D) Fluorescence spectroscopy

11. CsCl gradient centrifugation helps in separation of DNA and the basic principle involved is- DNA fragments can move and accumulate at a position where the density of the two (DNA and CsCl) is same. What will happen when both circular and linear DNA is present together?

A) Circular DNA will pellet while linear DNA will form a band
B) Linear DNA will pellet while circular DNA will form a band
C) Linear and circular DNA will form separate band
D) Both Linear and circular DNA will float at top

12. Photochemical smog is due to the presence of …….pollutant

A) NO B) SO_2 C) CO_2 D) CO

13. Cancer is often the result of activation of ____ to ____ and the inactivation of ____ genes.

A) oncogenes, proto-oncogenes, tumor-suppressor gene
B) proto-oncogenes, oncogenes, tumor-suppressor genes
C) oncogenes, tumor-suppressor genes, proto- oncogenes
D) proto-suppressor genes, suppressors, oncogenes

14. The major difference between hormones that have intracellular receptors and those that have cell membrane receptors is that the former tend to be

A) Larger B) Charged
C) Amino acid derivatives D) Hydrophobic

15. What is the name the secondary structure of tRNA?

A) Cloverleaf B) L-shaped C) Duplex D) Triple Helix

16. Which of the following rRNA molecules have peptidyl transferase activity in prokaryotes?

A) 5S rRNA B) 28S rRNA C) 23S rRNA D) 18S rRNA

17. Which three amino acids absorb in the near UV region are

A) tryptophan, tyrosine, aspragine B) tyrosine, histidine, tryptophan

C) tryptophan, tyrosine, and phenylalanine D) histidine, phenylalanine and tyrosine

18. Necrosis differs from apoptosis in that necrosis

A) Occurs more frequently
B) Causes DNA to fragment
C) Uses a caspase cascade
D) Causes cells to swell and burst while apoptotic cells shrink and condense

19. At what stage of cell cycle retinoblastoma act as check point

A) M→G1 B) G1→S C) S→G2 D) S

20. The secondary structure of a protein consists of all but one of the following. Which is the odd one out?

A) α-helices B) β-sheets C) Turns D) Disulfide bridges

21. Which of the following is not part of the lac operon of E. coli?

A) Genes for inducible enzymes of lactose metabolism
B) Genes for the repressor, a regulatory protein
C) Gene for RNA polymerase
D) A promoter, the RNA polymerase binding site

22. Dhfr is a marker used for in situ gene amplification and utilizes ……..as amplifying selective drug

A) Deoxycoformycine B) Methotraxate
C) Aminopterin D) Mycophenolic acid

23. Homeobox sequences

A) Are present in the genome of many animal species

B) Are found in prokaryotes but not in eukaryotes

C) Were identified as the integration sites for bacterial viruses

D) Represent integration sites for transposable elements

24. Which vector can carry largest piece of DNA

A) Plasmid B) Phage C) Cosmid D) BAC

25. What is true about microscopy?

A) TEM gives internal details of the specimen in contrast to SEM.

B) Phase contrast microscopy is not useful to identify the shape of living cell

C) SEM also provides a 2-d image while TEM provides a 3-d picture

D) Both A and B

26. Short DNA sequences which replicate and are inserted around the genome are known as

A) Selfish DNA
B) Satellite DNA
C) Transposable DNA
D) Tandem Repeats

27. The structure of all amino acids are same except for …..amino acid

A) Lysine B) Glycine C) Proline D) Alanine

28. Which of these amino acid are found very less in a protein?

A) Leucine and serine
B) Lysine and glutamic acid
C) Tryptophan and methionine
D) Leucine and lysine

29. QTL analysis is used to:

A) Identify chromosome regions associated with a complex trait in a genetic Cross

B) Map genes in bacterial viruses

C) Determine which genes are expressed at a developmental stage

D) Identify RNA polymerase binding sites

30. Denaturation of protein leads to loss of biological activity by

A) Formation of amino acid
B) Loss of primary structure
C) Loss of both primary and secondary structure
D) Loss of secondary and tertiary structure

31. Which of the following hormone is not used in the hydrolysis of triacylglycerol into the fatty acids in adipose tissues?

A) Epinephrine B) Norepinephrine C) Glucagon D) Insulin

32. Assuming Hardy-Weinberg equilibrium, the genoypte frequency of heterozygotes, if the frequency of the two alleles at the gene being studied are 0.6 and 0.4, will be:

A) 0.80 B) 0.64 C) 0.48 D) 0.32

33. The expression library contains

A) Whole genome
B) Only coding sequences
C) Only non coding sequences
D) cDNA representing mRNA

34. Mapping of human chromosomes:

A) Proceeded much more successfully as large numbers of DNA markers became available.

B) Has been restricted to the sex chromosomes because of small family sizes

C) Has determined that the number of linkage groups is about twice the number of chromosomes

D) Has demonstrated that almost all of the DNA is involved in coding for genes

35. The monomeric unit of nucleic acid are called _____
A) Nucleotides B) Nucleosides C) Purines D) Pyrimidines

36. Which of the following ensure stable binding of RNA polymerase at the promoter site?
A) RecA B) Sigma factor C) DNA photolyase D) DNA glycosylase

37. What is the binding energy?
A) Free energy released in the formation of enzyme-substrate interaction
B) The energy required to form a bond
C) The energy required to bind substrate
D) It is the activation energy

38. The law of independent assortment is inferred by
A) Test cross B) Monohybrid cross
C) Dihybrid cross D) Back cross

39. In which plasmid copy number control is lost?
A) F plasmid B) BAC vector C) pBR 322 D) pUC 18

40. Traditional method for the commercial production of citric acid is by
A) Solid state fermentation B) Continuos fermentation
C) Synchronous production D) Batch fermentation

41. Short DNA sequences which replicate and are inserted around the genome are known as
A) Tandem Repeats B) Selfish DNA
C) Transposable DNA D) Satellite DNA

42. What is the maximum percentage of recombination frequency between two genes?
A) 25% B) 50% C) 75% D) 100%

43. Peptide chain elongation involves all the following except
A) Peptidyl transferase B) GTP
C) Tu, Ts and G factors D) Formyl tRNA

44. The pathway for glucose synthesis by non-carbohydrate precursors is

A) Glycogenolysis B) Glycolysis

C) Glycogenesis D) Gluconeogenesis

45. Antisense technology

A) Selectively blocks expression of a gene

B) Combines organelle of a cell

C) Alters on transfer cells

D) None of these

46. Name the heavy chain of immunoglobulin G.

A) μ B) ε C) α D) γ

47. In a sieve chromatography

A) Smaller proteins enter the beads more readily

B) Large proteins elute first

C) Large proteins enter the beads more readily

D) Both A and B

48. The cells which has potential to develop and form an entire organism are known as

A) Totipotent cell B) Multipotent cells

C) Pleuripotent cells D) Adult stem cell

49. Which of the following is NOT the step of mRNA processing?

A) 5' capping B) Splicing of introns

C) RNA silencing D) Polyadenylation

50. Which molecule in affinity resin is used to purify His-tagged proteins

A) GST B) Maltose C) CM cellulose D) Nickel NTA

51. Catabolic repression is

A) Repression of His operon by Histidine B) Repression of lac operon by IPTG

C) Repression of lac operon by glucose D) Repression of Trp operon by trptophan

52. Mitochondrial DNA is advantageous for evolutionary studies because:

A) It is inherited only through the female parent and thus evolves in a way that allows trees of relationship to be easily constructed

B) It is inserted into the X chromosome

C) It first appeared in humans and is not found in other animals

D) It evolves more slowly than the genes in the nucleus

53. Which of the following organisms have thick peptidoglycan in their cell wall?

A) Yeast B) Molds

C) Gram-positive bacteria D) Gram-negative bacteria

54. Major Histocompatibility Complex is a tight cluster of linked_____
A) Proteins B) Carbohydrates C) Lipid molecules D) Genes

55. Mutagenicity of a given compound is checked with the use of
A) lac- Salmonella B) trp- Salmonella
C) his- Salmonella D) ara- Salmonella

56. Expression of a housekeeping gene would be an example of a
A) Control B) Standard
C) Exogenous normalizing variable D) Endogenous normalizing variable

57. Isoscizomers are the restriction enzymes which
A) Show 50% homology in the recognition site
B) The recognition site of one enzyme is present in the recognition site of other enzyme
C) Show no homology in recognition sequence
D) These are GC rich

58. Which of the following is X-linked recessive disorder?
A) Sickle cell anemia B) Color blindness
C) Albinism D) PTC tasting

59. UV mediated damage of DNA is repaired by
A) DNA glycosylase B) Nucleotide excision repair
C) Exchange of homologous segments D) Photoreactivation

60. Which of the following is an upstream process in fermentation?
A) Product recovery B) Product purification
C) Media formulation D) Cell lysis

61. Mark the one, which is NOT a lymphoid progenitor cell.
A) Monocyte B) B-cell C) T-cell D) NK cells

62. Insertion of cry gene in plant genome provides
A) Herbicide resistance B) Virus resistance
C) Insect resistance D) Drought resistance

63. Name the sequence of RNA, which is recognized by a small subunit of the ribosome.
A) Rho utilization site B) Downstream sequence
C) Upstream sequence D) Shine Dalgarno sequence

64. In PCR reactions Pfu is preferred over Taq as Pfu

A) Is more thermostable B) Is optimally active at higher temperature

C) Provides high fidelity D) Was declared as molecule of the year 1989

65. What is an Isozyme?

A) Same structure, different function B) Different structure, the same function

C) Same structure, the same function D) Different structure, different function

66. The term "prey" is associated with which type of hybrid

A) DBD hybrid B) AD hybrid

C) Reverse two hybrid D) Yeast hybrid

67. Which of the following protein does not involve in the initiation of replication?

A) DnaA B) DnaB

C) DnaF D) SSB (Single strand binding protein)

68. In a cross between a white-eyed female fruit fly and red-eyed male, what percent of the male offspring will have white eyes? (White eyes are X-linked, recessive)

A) 100% B) 50% C) 25% D) 0%

69. Synthesis of DNA from RNA is carried out by

A) Transpeptidase B) DNA polymerase I

C) RNA polymerase D) Reverse transcriptase

70. Inclusion bodies can be solubilized in

A) 6.0 M Gdn HCl B) 0.6M Tris HCl

C) 0.6M Phosphate buffer D) 0.6M Borate buffer

71. Ethidium bromide staining is used to stain

A) Proteins B) Lipids C) Nucleic acids D) Carbohydrates

72. The famous experiment by Avery et al reported that

A) Transformation B) DNA as transforming agent

C) RNA as transforming agent D) Replication is semiconservative

73. To amplify a DNA sequence 5' gcattaggcactgggatatctcagctgacacgtatgc 3', the following primer can be used for this sequence

A) 5'gcattaggcact B) 3' gcattaggcact C) 5' gcatacgtgtc D) 3' gcatacgtgtc

74. Name the coenzyme of riboflavin (B2)

A) NAD or NADP
B) FAD and FMN
C) Coenzyme A
D) Thiamine pyrophosphate

75. Mitochondria from cell homogenate can be pelleted out by centrifugation at

A) 1000Xg
B) 2000Xg
C) 5000Xg
D) 10000Xg

x-x-x