

MSc(2Yr)(Microbial Biotechnology)

1. Which of the following microbes does not contain mycolic acid in its cell wall?
 - A) *Mycobacterium tuberculosis*
 - B) *Staphylococcus aureus*
 - C) *Nocardia asteroides*
 - D) *Mycobacterium leprae*
2. Which of the following bacteria produces endospores and is a strict aerobe?
 - A) *Corynebacterium diphtheriae*
 - B) *Listeria monocytogenes*
 - C) *Bacillus anthracis*
 - D) *Clostridium perfringens*
3. Tyndallization is a process used for destruction of
 - A) Spores
 - B) Acid fast bacteria
 - C) Pathogenic bacteria
 - D) Fungal contaminants
4. Chronic granulomatous disease arises due to defects in the
 - A) Monocytes and neutrophils
 - B) T cells
 - C) B cells
 - D) RBCs
5. Which of the following scientists is best known for his work on antiseptic surgery?
 - A) Joseph Lister
 - B) Robert Koch
 - C) Sergei Winogradsky
 - D) Alphonse Laveran
6. The antifungal drug griseofulvin targets
 - A) Cell wall
 - B) 60 S ribosome
 - C) DNA gyrase
 - D) Microtubule assembly
7. Formation of a pseudomembrane in the throat is a diagnostic feature of
 - A) Diphtheria
 - B) Scarlet fever
 - C) Influenza

D) Tuberculosis

8. Lithotrophs are bacteria that use inorganic molecules as a source of

- A) Carbon
- B) Electrons
- C) Energy
- D) Water

9. If pH of a solution is 2, what is its pOH?

- A) 5
- B) 2
- C) 12
- D) 6

10. Growth yields are proportional to the concentration of most limiting nutrients. This is popularly known as

- A) Liebig's law
- B) Shelford's law
- C) Schaechter's law
- D) Kleiber's law

11. Which of the following groups of microbes will be most resistant to moist heat killing, assuming that all are mesophiles?

- A) Gram-positive bacteria
- B) Gram-negative bacteria
- C) Yeasts
- D) Moulds

12. Arrange the following in increasing order of their reducing potential:

(i) FAD/FADH_2 , (ii) fumarate/succinate, (iii) NAD^+/NADH , (iv) CoQ/CoQH_2

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

13. In eukaryotic microbes, fatty acid oxidation and synthesis take place in _____ and _____ respectively.

- A) Cytoplasm and lysosomes
- B) Mitochondria and cytoplasm
- C) Cytoplasm and mitochondria
- D) Both take place in cytoplasm

14. The common reaction centre chlorophyll in purple bacteria is

- A) P680

- B) P700
- C) P870
- D) P840

15. When a mutation results in a triplet coding for different but functionally equivalent amino acid, it is called
- A) Neutral mutation
 - B) Silent mutation
 - C) Transition
 - D) Transversion
16. During Hfr recombination, the recipient becomes
- A) F+
 - B) F-
 - C) Hfr +
 - D) Either F+ or Hfr+
17. Bacterial artificial chromosomes are cloning vectors commonly based on
- A) Cosmid
 - B) Phagemid
 - C) F factor
 - D) Bacterial genome
18. Mitochondria in eukaryotes may have arisen from an ancestor of
- A) *Rickettsia*
 - B) *Treponema*
 - C) *Chlamydia*
 - D) Cyanobacteria
19. *Sargassum* is an example of
- A) Red algae
 - B) Brown algae
 - C) Dinoflagellates
 - D) Euglenoids
20. Secondary steps in waste water treatment involve the removal of _____ by _____ processes respectively
- A) Organic matter, physical
 - B) Organic matter, biological
 - C) Inorganic matter, physical
 - D) Inorganic matter, biological
21. Which of the following antibody classes possesses a J chain?
- A) IgA
 - B) IgD
 - C) IgE
 - D) IgG

22. In addition to absorbing the red light, chlorophyll molecules may also absorb light in the _____range
- A) Yellow
 - B) Green
 - C) Blue
 - D) Pink
23. Somatic hyper mutation is important in the development of the following type of immune cells.
- A) T cells
 - B) Macrophages
 - C) Neutrophils
 - D) B cells
24. Amongst the eukaryotic RNA polymerases, RNA polymerase I is localized in the
- A) Nucleolus
 - B) Chromatin
 - C) Nuclear matrix
 - D) Cytoplasm
25. Salivary glands are primarily infected during which of the following viral infections?
- A) Measles
 - B) Influenza
 - C) Herpes
 - D) Mumps
26. Granuloma formation is often associated with the following bacterial disease
- A) Sore throat
 - B) Tuberculosis
 - C) Gastroenteritis
 - D) Pertussis
27. Which of the following is a common post-replication repair system?
- A) Excision repair
 - B) Recombination repair
 - C) SOS repair
 - D) Mismatch repair
28. Pectinolysis will be more common in
- A) Butter
 - B) Meats
 - C) Starchy foods
 - D) Fruits
29. Mycotoxins of the group fumonisins act by inhibiting
- A) Sphingolipids
 - B) Proteins

- C) DNA
- D) RNA

30. Butter milk and yogurt are produced through which types of lactic acid fermentation?
- A) Both mesophilic
 - B) Both thermophilic
 - C) Mesophilic and thermophilic respectively
 - D) Thermophilic and mesophilic respectively
31. Rope spoilage of bread is commonly due to
- A) *Rhizopus*
 - B) *Aspergillus*
 - C) *Bacillus*
 - D) *Leuconostoc*
32. Which of the following is a promising source of Vitamin A?
- A) *Penicillium*
 - B) *Rhodotorula*
 - C) *Streptococcus*
 - D) *Rhizopus*
33. Which of the following is the smallest of all amino acids?
- A) Glycine
 - B) Histidine
 - C) Proline
 - D) Alanine
34. A culture system in which particular nutrients are regularly added to the culture system without removal of spent media is called _____ culture
- A) Chemostat
 - B) Continuous
 - C) Batch
 - D) Fed-batch
35. Which of the following is a neurotoxin?
- A) Tetanus toxin
 - B) Shiga toxin
 - C) Exotoxin A
 - D) Cholera toxin
36. One gene one enzyme hypothesis was proposed by
- A) Beadle and Tatum
 - B) Meselson and Stahl
 - C) Hershey and Chase
 - D) Griffith
37. In recent months, illegal use of which of the following GM crops has been reported in India?

- A) Bt cotton
- B) Bt brinjal
- C) Flavr savr tomatoes
- D) GM maize

38. Wobble hypothesis is linked with

- A) Degeneracy of the DNA code
- B) Post-translational protein processing
- C) Semi-conservative DNA replication
- D) Protein folding

39. Which of the following statements about membrane proteins is not correct?

- A) Integral membrane proteins have transmembrane domains rich in hydrophobic amino acids.
- B) Integral membrane proteins have ends rich in hydrophilic amino acids.
- C) Transmembrane porins have hydrophilic amino acids that point inwards in the β -barrels
- D) Integral membrane proteins are anchored to the lipid bilayer by ionic bonds.

40. Ras protein is a

- A) Tyrosine kinase
- B) Serine-threonine kinase
- C) GTPase
- D) Phosphatidylinositol kinase

41. Which of the following methods is commonly used to introduce genes into plant cells?

- A) Microinjection
- B) Electroporation
- C) Transformation of competent cells
- D) Gene gun

42. p53 normally promotes

- A) Apoptosis
- B) DNA replication
- C) Cell division
- D) RNA synthesis

43. Which would be the best chromatography technique to separate a protein that binds strongly to its substrate?

- A) Cation exchange chromatography
- B) Affinity chromatography
- C) Gel filtration
- D) Anion exchange chromatography

44. In two-dimensional gel electrophoresis system, the second step involves separation of proteins based on their

- A) Molecular weight
- B) Charge to mass ratio
- C) Isoelectric point
- D) Protein-specific antibodies

45. In PCR, the advantage of Pfu over Taq polymerase is

- A) High efficiency

- B) Thermostability
- C) Cheaper synthesis
- D) Lower error rate

46. If an mRNA is 312 nucleotide in length, including start and stop codon, it will transcribe a protein about _____ amino acids in length

- A) 110
- B) 106
- C) 103
- D) 120

47. Which of the following is the most abundant protein in nature?

- A) Rubisco
- B) Chlorophyll
- C) Insulin
- D) Myoglobin

48. Allosteric regulation acts by

- A) Reversible binding through formation of non-covalent bond
- B) Reversible binding through formation of covalent bond
- C) Irreversible binding through formation of covalent bond
- D) Irreversible binding through formation of non-covalent bond

49. Which of the following determine the overall shape of a bacterial cell?

- A) Cell membrane
- B) Nucleoid
- C) Cell wall
- D) Cytoskeleton

50. Which of the following eukaryotic cell wall components are nitrogenous compounds?

- A) Glucans
- B) Cellulose
- C) Lignin
- D) Chitin

51. Which of the following are mineralized biological structures?

- A) Glycosaminoglycans
- B) Chitin
- C) Pectins
- D) Diatom cell walls

52. Which of the following is not a technique for tissue homogenization?

- A) Bead beating
- B) Dehydration
- C) Sonication
- D) Grinding

53. In an ecosystem, biomass will be minimal at which of the following trophic levels?

- A) Carnivores
- B) Herbivores
- C) Primary producers
- D) Both B and C

54. Northern blotting detects

- A) DNA

- B) RNA
- C) Proteins
- D) Lipids

55. Trickling filters are used for

- A) Wine production
- B) Waste water treatment
- C) Acetic acid synthesis
- D) Manufacturing of drugs

56. Prions are infectious particles containing only the

- A) Proteins
- B) DNA
- C) RNA
- D) Lipids

57. Guanosine is a

- A) Purine
- B) Pyrimidine
- C) Nucleotide
- D) Nucleoside

58. Which of the following structural forms of DNA is a left-handed helix?

- A) Z form
- B) A form
- C) B form
- D) X form

59. Cybrids are plant hybrids produced by fusion of

- A) Two cytoplasts
- B) Protoplast and nucleus
- C) Protoplast and cytoplasm
- D) Two protoplasts

60. The antibiotic that inhibits protein synthesis

- A) Ciprofloxacin
- B) Polymyxin
- C) Amikacin
- D) Rifampicin

61. The housekeeping sigma factor for *E. coli* is

- A) Sigma 54
- B) Sigma 70
- C) Sigma 38
- D) Sigma 24

62. Thick filaments in skeletal muscles are composed of

- A) Tropomyosin
- B) Actin
- C) Troponin
- D) Myosin

63. Cell-mediated adaptive immunity involves
- A) B cells
 - B) T cells
 - C) Macrophages
 - D) Neutrophils
64. The points at which crossing-over takes place between homologous chromosomes are named
- A) Synaptonemal complexes
 - B) Centromeres
 - C) Chiasmata
 - D) Interkinins
65. An interaction between non-allelic genes in which one locus prevents expression of an allele at another locus, but not vice versa is called
- A) Epistasis
 - B) Complementation
 - C) Collaboration
 - D) Modification
66. The gliding bacteria that aggregate to form spore-releasing fruiting bodies under harsh conditions are
- A) Actinomycetes
 - B) Myxobacteria
 - C) *Rickettsia*
 - D) *Chlamydia*
67. Serum sickness is an example of _____ hypersensitivity.
- A) Type I
 - B) Type II
 - C) Type III
 - D) Type IV
68. The famous quote “In the field of observation, chance favors only prepared minds.” was given by
- A) Charles Darwin
 - B) Robert Hooke
 - C) Louis Pasteur
 - D) Robert Koch
69. Gray ring is used in which of the following microscopes?
- A) Phase contrast microscope
 - B) Scanning electron microscope
 - C) Transmission electron microscope
 - D) Confocal microscope
70. Production of secondary metabolites is associated with _____ phase of bacterial growth curve
- A) Lag
 - B) Log
 - C) Stationary
 - D) Death

71. Which of the following is not a plasmid vector?
- A) pBR322
 - B) pUC19
 - C) pACYC177
 - D) M13
72. In commensalism,
- A) Both participants are benefitted
 - B) One is benefitted, other remains unaffected
 - C) One is benefitted, other is harmed
 - D) Growth of one participant is completely dependent on the other
73. Under conditions of antigen excess, the complexes between IgA and a tetravalent antigen will have the composition
- A) Ag2Ab1
 - B) Ag4Ab1
 - C) Ag4Ab3
 - D) Ag2Ab7
74. Which of the following organisms is an obligate intracellular parasite?
- A) *Rickettsia prowazekii*
 - B) *Mycobacterium tuberculosis*
 - C) *Salmonella typhi*
 - D) *Shigella flexneri*
75. Kojic acid is a major secondary metabolite in
- A) *Penicillium*
 - B) *Aspergillus*
 - C) *Micrococcus*
 - D) *Leuconostoc*

x-x-x