#### 1. What is Microbiology?

a) Study of molecules that are visible to human eyes

b) Study of animals and their family

#### c) Study of organisms that are not visible to naked eyes

d) Study of microscope

#### 2. Who is known as the father of Microbiology?

- a) Edwin John Butler
- b) Ferdinand Cohn
- c) Robert Koch

#### d) Antoni van Leeuwenhoek

3. Which microorganism(s) among the following perform photosynthesis by utilizing light?

- a) Cyanobacteria, Fungi and Viruses
- b) Viruses
- c) Cyanobacteria
- d) Fungi

4. Which part of the compound microscope helps in gathering and focusing light rays on the specimen to be viewed?

#### a) Condenser lens

- b) Magnifying lens
- c) Objective lens
- d) Eyepiece lens

5. Which of the following are produced by microorganisms?

a) Alcoholic beverages

- b) Fermented dairy products
- c) Breads

#### d) All of the mentioned

6. What is the approximate size of the bacterial cell?

- a) 1mm in diameter
- b) 0.5 to 1.0 micrometer in diameter
- c) 2mm in diameter
- d) 2 micrometer in diameter

7. The greatest resolution in light microscopy can be obtained with

a) Shortest wavelength of visible light used

b) Longest wavelength of visible light used

c) An objective with minimum numerical aperture

### d) Shortest wavelength of visible light used and an objective with the maximum numerical aperture

8. Which of the following is used in electron microscope?

#### a) electron beams and magnetic fields

b) light waves

c) magnetic fields

d) electron beams

8. Which among the following are "Spirochetes"?

- a) Streptomyces sp.
- b) Treponema pallidum
- c) Spirillum volutans
- d) Corynebacterium diphtheriae

9. Bacteria having clusters of flagella at both poles of cells are known as?

#### a) Amphitrichous

- b) Monotrichous
- c) Peritrichous
- d) Lophotrichous

10. The respiratory chain of bacteria is associated with the

#### a) cytoplasmic membrane

- b) cell wall
- c) cytoplasm
- d) mitochondrial membrane

11. Glycolysis can occur in \_\_\_\_\_

#### a) anaerobic cells

- b) aerobic cells
- c) neither aerobic and anaerobic cells
- d) both aerobic and anaerobic cells

13. Which of the following enzyme removes the RNA primer with its 5'-nuclease activity?a) DNA polymerase IIIb) RNA polymerasec) DNA polymerase I

d) DNA polymerase II

14. Phosphorus is essential component of \_\_\_\_\_

a) phospholipids

b) teichoic acid

c) nucleotides

#### d) All of the mentioned

15. The bacterium Staphylococcus aureus is which type of bacteria?

#### a) Mesophile

b) Mesophile and psychrophile

- c) Psychrophile
- d) Thermophile

16. Growth of bacteria or microorganisms refer to \_\_\_\_\_

a) changes in the total population

#### b) an increase in number of cells

c) an increase in the size of an individual organism

d) an increase in the mass of an individual organism

17. Which of the following method can be used to determine the number of bacteria quantitatively?

- a) Spread-plate
- b) Streak-plate
- c) Pour-plate and spread plate
- d) Pour plate

18. Which among the following are microaerophilic bacteria?

#### a) Treponema

- b) Borrelia
- c) Spirochaeta
- d) Cristispira

19. Penicillin causes inhibition of Mycoplasmas.

#### a) False

b) True

20. What are the cell wall structural components of fungi?

a) peptidoglycan
b) cellulose
c) chitin
d) chitin, cellulose, or hemicellulose

21. Cryptococcosis is a disease of \_\_\_\_\_

a) viral infectionb) mycotic infectionc) parasitic infectiond) bacterial infection

22. Which among the following is a pathogenic algae for humans?

- a) Cephaleuros
- b) Acanthopeltis
- c) Chlorella

d) Prototheca

23. Chrysolaminarin is the reserved food of

a) Bacillariophycophyta
b) Xanthophycophyta
c) Chlorophycophyta
d) Phaeophycophyta

24. Protozoa that eat other organisms are known as \_\_\_\_\_

a) parasiticb) mutualisticc) holozoicd) saprophytic

25. Plasmodium divides by which of the following method most commonly?

- a) Regeneration b) Budding
- c) Binary fission
- d) Multiple fission

26. Which of the following is a family of lambda phage viruses?

#### a) Styloviridae

- b) Corticoviridaec) Microviridae
- d) Pedoviridae

27. What does a viral DNA becomes after being associated with the bacterial chromosome?

a) plasmidb) plaquec) prophaged) gene

28. Vaccination was invented by \_\_\_\_\_

a) Watson

b) Jenner

c) Crick

d) Pasteur

29. For which viral disease, vaccine has been recently developed through the use of tissue culture?

a) Smallpox

b) Rabies

c) Mumps

d) Measles

30. Which of the following inhibits DNA replication?

a) x-raysb) gamma raysc) UV lightd) cathode rays

31. Which was the first disease for which a chemotherapeutic agent was used?

a) Small poxb) Syphilisc) AIDSd) Malaria

32. Bacterial cells grown in a medium exposed to high osmotic pressure, changes shape from rod-shaped to \_\_\_\_\_\_ shaped.

a) elongatedb) irregularc) rod shapedd) spherical

33. Tyrocidines are more effective against \_\_\_\_\_

- a) Gram-negative organisms
- b) Gram-positive organisms
- c) Spirochetes
- d) Mycoplasmas

34. Which of the following is the most accurate method for microbial assay of antibiotics?

- a) Chemical and biological assay
- b) Biological assay
- c) Chemical assay

d) Physical assay

35. Which among the following is not an ammonia-oxidizing bacteria?

#### a) Nitrospina gracilis

b) Nitrosococcus oceanus

- c) Nitrosomonas europaea
- d) Nitrosovibrio tenuis

36. Cellulose is degraded to cellobiose by the enzyme

a) cellulose dehydrogenase

- b) hexokinase
- c) beta-glucosidase
- d) cellulase

37. Sulphates are reduced to hydrogen sulphide by \_\_\_\_\_

- a) Thiobacillus thiooxidans
- b) Rhodospirillum
- c) Desulfotomaculum sp.
- d) Photosynthetic sulfur bacteria

38. The microorganisms from lakes and rivers can grow at a salt concentration of

a) above 1 percent
b) below 1 percent
c) 2.5 to 4 percent
d) 5 percent

39. In regions of the estuary that are nutritionally poor, it is more likely to find which of the following organisms?

a) viruses
b) coliforms
c) fecal streptococci
d) appendaged bacteria

40. In which of the following treatment involve oxidation of organic constituents of the wastewater?

a) Final treatment

- b) Advanced treatment
- c) Secondary treatment
- d) Primary treatment

41. Which among the following group of microorganisms are found in the ducts of cow's mammary glands?

#### a) Micrococci

- b) Microbacteria
- c) Lactobacilli
- d) Coliforms

42. Which of the following microorganism is eliminated in canned foods?

#### a) Lactobacillus

#### b) Clostridium botulinum

- c) Mycobacterium tuberculosis
- d) Coxiella burnetii

43. Bacterial cell grown on hydrocarbon wastes from the petroleum industry are a source of \_\_\_\_\_

a) fatsb) vitaminsc) carbohydrates

#### d) proteins

44. Which of the following microorganism produces dextran?

#### a) Leuconostoc mesenteroides

- b) Streptomyces olivaceus
- c) Bacillus thuringiensis
- d) Bacillus polymyxa

45. The principal microorganism for yogurt is \_\_\_\_\_

a) Leuconostoc citrovorum

b) Streptococcus lactis

#### c) Streptococcus thermophilus

d) Lactobacillus acidophilus

46. Which of the following yeast can be used to produce microbial protein?

a) Eremothecium ashbyi

#### b) Candida utilis

- c) Saccharomyces cerevisiae
- d) Candida milleri

#### 47. Acridine orange is which type of mutagen?

- a) chemical compounds
- b) transposons

c) base analog

#### d) intercalating agents

48. Lipopolysaccharide in cell walls is characteristic of?

a) Algae

- b) Fungi
- c) Gram-negative bacteria
- d) Gram-positive bacteria

49. Which of the following are present in teichoic acids?

a) glycerol residues
b) ribitol residues
c) ribitol or glycerol residues
d) glucose residues

50. Which of the following are true for cytoplasmic membrane?

a) site of generation of protonmotive force

b) hydrophilic barrier

c) hydrophobic barrier

d) hydrophobic barrier and site of generation of protonmotive force

51. For the examination of microbial cells we require the use of?

a) High-power microscope

- b) Low-power microscope
- c) High-power microscope at a magnification of about 1,000 diameters
- d) Low-power microscope at a magnification of about 1,000 diameters

52. Growth of microbes in a solid media is identified by the formation of?

a) pellicle at the top of mediab) coloniesc) sediment at the bottomd) turbidity

53. What are the blood serum proteins produced by animals called?

- a) Enzymesb) Antibodies
- c) Amino acids
- d) Toxins

54. Plamids are circular DNA molecules capable of autonomous replication.

#### a) True

b) False

55. The dye eosinate of methylene blue belongs to which group?

## a) Acidic dyeb) Basic dye

c) Neutral dye

d) Oxazine dye

56. What is the correct order of staining reagents in Gram-Staining?

a) Crystal violet, alcohol, iodine solution, safranin

#### b) Crystal violet, iodine solution, alcohol, safranin

c) Crystal violet, safranin, alcohol, iodine solution

d) Iodine solution, crystal violet, alcohol, safranin

57. Which bacteria appears purple-violet colour after staining?

#### a) Gram-positive

b) Gram-negative

- c) Both Gram-positive and Gram-negative
- d) Neither Gram-positive nor Gram-negative

58. Which of the following are true for Gram-negative bacteria?

a) upon alcohol treatment, the permeability of the cell wall increases

- b) crystal violet-iodine (CV-I) complex is extracted
- c) pore size decreases and the CV-I complex cannot be extracted

d) alcohol treatment increases the permeability of the cell wall and the CV-I complex can be extracted

59. Gram-positive bacteria are usually more susceptible to?

a) streptomycinb) tetracyclinc) penicillind) ampicillin

60. Which of the staining technique helps in demonstrating spore structure in bacteria as well as free spores?

a) Acid-fast stain
b) Endospore stain
c) Capsule stain
d) Flagella stain

61. In Gram-staining, iodine is used as a \_\_\_\_\_

- a) fixativeb) mordantc) solublizer
- d) stain

62. Which of the following is the example of Gram-negative bacteria?

- a) Lactobacillus
- b) Eschericia coli
- c) Staphylococcus aureus
- d) Bacillus subtilis

63. In the classification of bacteria according to shape, which among the following refers to cuboidal arrangement of bacterial cells?

a) Tetrads
b) Staphylococci
c) Sarcinae
d) Streptococci

64. When rod shaped bacteria appears in pairs, it is known as?

#### a) Diplobacilli

- b) Streptobacilli
- c) Diplococci
- d) Staphylococci

65. The L Ring in Gram-Negative bacterium flagella is associated with \_\_\_\_\_

#### a) Peptidogycan

b) Outer Membrane (The flagella in Gram-Negative bacteria has four basal rings. The L Ring of flagella is associated with the outer membrane. The P ring is associated with the peptidoglycan layer and both the M and S rings are associated with the cytoplasmic membrane.)

- c) Cytoplasmic Membrane
- d) Cell Membrane

66. F pilus has a major role as \_\_\_\_\_

a) motility of the cell

b) port of entry of genetic material during mating

- c) attachment to host cell
- d) human infection

67. When a bacteria swim towards a chemical, it is termed as

#### a) positive chemotaxis

- b) phototaxis
- c) negative chemotaxis
- d) magnetotaxis

68. Which type of force drives the flagellar motion?

#### a) Protonmotive force

- b) ATP driven
- c) Protonmotive and ATP driven
- d) No protonmotive nor ATP driven

69. Peptidoglycan is made up of

a) N-acetylglucosamine

b) N-acetylmuramic acid

c) N-acetylglucosamine, N-acetylmuramic acid

#### d) N-acetylglucosamine, N-acetylmuramic acid, amino acids

70. The outer membrane of the Gram-negative cell wall is anchored to the underlying peptidoglycan by means of which of the following?

#### a) Braun's Lipoprotein

- b) Phospholipids
- c) Proteins
- d) Lipopolysaccharide

71. Which among the following acts as receptors for bacteriophage attachment in Gram-negative bacteria?

a) Cilia

#### b) O antigens

- c) Lipid A
- d) Teichoic acid

72. NAG and NAM of peptidoglycan layer is linked by \_\_\_\_\_

#### a) beta-(1,4) glycosidic linkage

- b) alpha-(1,4) glycosidic linkage
- c) alpha-(1,6) glycosidic linkage
- d) beta-(1,6) glycosidic linkage

73. Gram-negative bacteria are more resistant to antibiotics due to the presence of?

- a) Thin peptidoglycan wall
- b) Outer lipopolysaccharide layer

c) Porin proteins

d) Teichoic acid

74. Which of the following are functions of water in the culture medium?

a) nutrients must be in aqueous solution

b) cofactor of enzymes

c) provides resistance to sudden transient temperature changes

d) it is a chemical reactant, nutrients must also be present in aqueous solution and provide resistance to sudden temperature changes

75. Which of the following is used as a solidifying agent for media?

a) Beef extract

- b) Peptone
- c) Agar

d) Yeast extract

76. The isolation of gonorrhea-causing organism, Neisseria gonorrhoeae by the use of certain antibiotics in media is an example of which of the following?

#### a) Selective media

- b) Differential media
- c) Enriched media

d) Assay media

77. Nutrient broth, a liquid media contains beef extract and peptone respectively in how much amounts?

a) 0.2%, 0.4% b) 0.1%, 0.6% c) 0.3%, 0.5% d) 0.7%, 0.3%

78. Which of the following instrument is used for sterilizing the media after it has been prepared?

#### a) Autoclave

- b) Laminar Air Flow Chamber
- c) Inoculum Needle
- d) Incubator

79. Which of the following is a Complex media for fungal growth?

a) Nutrient broth
b) Luria-Bertani media
c) Potato Dextrose Agar(PDA) media
d) Mac Conkey Agar media

80. Which of the following are functions of Maintenance Media?

- a) used for assay of vitamins, amino acids
- b) used for determining the bacterial content

c) used for determining the type of growth produced by bacteria

#### d) used for the maintenance of the viability and physiological characteristics

81. The temperature that allows for most rapid growth during a short period of time is known as \_\_\_\_\_

a) Minimum Temperature

- b) Maximum Temperature
- c) Optimum Temperature

d) Growth Temperature

82. Mesophiles are group of bacteria that grow within the temperature range of?

a) 0-20 degree Celsius
b) 25-40 degree Celsius
c) 45-60 degree Celsius
d) more than 60 degree Celsius

83. The optimum pH for the growth of most bacteria lies between \_\_\_\_\_

a) 5-9
b) 6.5-7.5
c) 2-3.5
d) 9-9.5

84. Equatorial ridge formation in the cell wall takes place in which of the following bacteria?

a) Streptomyces sp.
b) Bacillus subtilis
c) Streptococcus faecalis
d) Escherichia coli

85. The portion of the growth curve where rapid growth of bacteria is observed is known as \_\_\_\_\_

a) Lag phaseb) Logarithmic phasec) Stationary phased) Decline phase

86. Lag phase is also known as \_\_\_\_\_

#### a) period of initial adjustment

- b) transitional period
- c) generation time
- d) period of rapid growth

87. In which of the following phase secondary metabolites are produced during growth?

a) Lag phase

b) Log/Exponential phase

c) Stationary phase

d) Death phase

88. Which phase shows the reproduction rate equal to the equivalent death rate?

# a) Log phaseb) Stationary phasec) Death phase

d) Lag phase

89. Which of the following is used to grow bacterial culture continuously?

#### a) Chemostat

- b) Hemostat
- c) Coulter-Counter

#### d) Turbidostat

90. Which of the following instrument is used for the bacterial count?

#### a) Petroff-Hausser counting chamber

- b) Microscope
- c) Chemostat
- d) Turbidostat

91. Which of the following method is used for a viable count of a culture?

- a) Direct microscopic count
- b) Plate-count method
- c) Membrane-filter count
- d) Plate-count method and membrane-filter count

92. How many cells present per milliliter in a bacterial culture can make the culture turbid?

a)1 cell b)1000 cells c)1 lakh cells d)10<sup>7</sup>-10<sup>8</sup> cells

93. Colony-forming units per ml is the unit of

a) Microscopic count

- b) Electronic enumeration
- c) Plate count

d) Turbidimetric measurement

94. Isolation of pure culture refers to \_\_\_\_\_

a) purification of culture

b) introduction of inoculum

c) separation of a single colony

d) to grow microorganisms on a surface

95. Vibrio cholerae can grow in a medium with a pH of \_\_\_\_\_

a) 5.5 b) 7.0 c) 8.5 d) 2.0

96. In pour-plate method, the medium should be maintained at what temperature?

a) 37 degree C
b) 67 degree C
c) 45 degree C
d) 0 degree C

97. Which of the following are not performed in lyophilization?

#### a) agar slant is covered with mineral oil

- b) cell suspension is frozen at -60 degree to -78 degree C
- c) vials are connected to high-vacuum line
- d) bacterial sample is dehydrated

98. Which of the following is a function of cryoprotective agents?

- a) for long-term preservation of cultures
- b) prevents cell damage due to ice crystal formation
- c) prevents formation of ice
- d) to trap the liquid nitrogen

99. Nichrome loop wire is used in which of the following techniques?

a) Pour-plate

#### b) Streak-plate

c) Spread-plate

d) Roll-tube technique

100. Which device is used to pick a single bacterial cell from a mixed culture?
a) microscope
b) micropipette
c) microprobe
d) micromanipulator

101. Which of the following has a larger diameter?

#### a) well-separated colonies

b) crowded coloniesc) young coloniesd) old colonies

102. Growth in broth cultures occurs mainly in the form of\_\_\_\_\_

a) slightly turbid
b) heavy surface pellicle
c) sediment
d) viscous

103. The endoflagella is present in which class of bacteria?

a) Spirilla
b) Spirochetes
c) Bacillus
d) Coccus
104.