



## Dr.G.R.Damodaran College of Science

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I M.Sc [2017-2019]

Semester I

Core: Applied Microbiology-158B

Multiple Choice Questions.

1. The highly resistant structures of bacteria are called \_\_\_\_\_ .
- A. Endospores.
  - B. PHB.
  - C. Capsule.
  - D. Vesicle.

ANSWER: A

2. \_\_\_\_\_ bacteria vary widely in their morphology.
- A. Pleomorphic.
  - B. Polymorphic.
  - C. Monomorphic.
  - D. Dimorphic.

ANSWER: A

3. If an organism loses its cell wall, the resultant structure called a \_\_\_\_\_.
- A. Endospores.
  - B. Protoplast.
  - C. Spheroplast.
  - D. Spores.

ANSWER: B

4. An antibiotic related to alexander is \_\_\_\_\_.
- A. Penicillin.
  - B. Ampicillin.
  - C. Tetracyclin.
  - D. Streptomycin.

ANSWER: A

5. Which one of the following produce endospore?
- A. Clostridium sp.
  - B. Cladosporium sp.
  - C. Acremonium sp.
  - D. Claviceps sp.

ANSWER: A

6. The pattern of flagellation in which the flagella are distributed all over the surface of bacteria is called \_\_\_\_\_.

- A. Peritrichous.
- B. Monotrichous.
- C. Atrichous.
- D. Amphitrichous.

ANSWER: A

7. Which of the following is related to Antony van leeuwenhoek.

- A. Vaccine.
- B. Germ theory.
- C. Animalcules.
- D. Medium.

ANSWER: C

8. Proteins bound to the DNA of the eukaryotic cells are called \_\_\_\_\_.

- A. Histamines.
- B. Histones.
- C. Factor H.
- D. Hirsutum.

ANSWER: B

9. How many chromosomes are there in Bacteria?.

- A. one.
- B. Two.
- C. Twenty Three.
- D. Fourteen.

ANSWER: A

10. A membrane that allows the passage of only a selected group of substances is said to be \_\_\_\_\_.

- A. Selectively permeable.
- B. Impermeable.
- C. Semi permeable.
- D. Impenetrable.

ANSWER: A

11. Cells immersed in a / an \_\_\_\_\_ solution would exhibit no change in their cell volume.

- A. Hypertonic.
- B. Hypotonic.
- C. Isotonic.
- D. Immiscible.

ANSWER: C

12. Organisms in \_\_\_\_\_ phase are adapting to the new environment.

- A. Log.
- B. Lag.
- C. Stationary.
- D. Decline.

ANSWER: B

13. Siderophore transports \_\_\_\_\_.

- A. Catecol.
- B. Fumerol.

- C. Iron
- D. Phenoxycatochelate.

ANSWER: C

14. Who discovered Vaccination for small pox?

- A. Jenner
- B. Pasteur
- C. Koch
- D. Antony

ANSWER: A

15. Organisms that can tolerate pH below 7.0 are called \_\_\_\_\_.

- A. Acidophiles.
- B. Thermophiles.
- C. Hyperthermophiles.
- D. Alkalinophiles.

ANSWER: A

16. Organisms grow above Fifty degree Celsius are called \_\_\_\_\_.

- A. Acidophiles.
- B. Hyperthermophiles.
- C. Alkalinophiles.
- D. Thermophiles.

ANSWER: D

17. Obligate anaerobes are killed by a highly reactive form of oxygen called \_\_\_\_\_.

- A. Superoxide.
- B. Reactive oxygen.
- C. Free radicals.
- D. Dismutase.

ANSWER: A

18. When cells lose water and their membranes shrink away from the cell wall they are undergoing \_\_\_\_\_.

- A. Pseudolysis.
- B. Plasmolysis.
- C. Cell wall lysis.
- D. Breakdown of cytoplasm.

ANSWER: B

19. Populations of cells that are at the same stage of their life cycle. All the cells in the culture will divide at the same time is -----.

- A. Batch culture
- B. Continuous culture
- C. Synchronous culture
- D. None

ANSWER: C

20. A 45X objective and a 10X ocular produce a total magnification of \_\_\_\_\_.

- A. 4500.
- B. 450.

C. 10.

D. 45.

ANSWER: B

21. Living, unstained cells and organisms can be observed best using\_\_\_\_\_.

A. Fluorescent microscopy.

B. Electron Microscopy.

C. Phase contrast microscopy.

D. Scanning Microscopy.

ANSWER: C

22. Which of the following is NOT equivalent to 10 micrometers?

A. 0.0001 cm.

B. 0.01 mm.

C. 10,000 nm.

D. 100,000 Angstroms.

ANSWER: A

23. Living, unstained cells and organisms can be observed best using\_\_\_\_\_.

A. Fluorescent microscopy.

B. Electron microscopy.

C. Phase contrast microscopy.

D. Scanning microscopy.

ANSWER: C

24. Agar agar is isolated from-----

A. algae

B. Fungi.

C. Bacteria.

D. yeast.

ANSWER: A

25. Transmission electron microscopy is best for high magnification viewing of\_\_\_\_\_.

A. internal structure of fixed cells.

B. internal structure of live, motile cells.

C. surface structure of fixed cells.

D. surface membranes of live, motile cells.

ANSWER: B

26. ----- microscope is used for the study of living microorganisms.

A. Bright field

B. Dark field

C. Electron

D. Scanning

ANSWER: B

27. Which of the following best describe about the fungi?

A. Fungi are photosynthetic eukaryotes.

B. Fungi have cell walls of peptidoglycan.

C. Fungi are procaryotic cells.

D. Fungi secrete extracellular enzymes to breakdown nutrients.

ANSWER: D

28. The most significant reason why fungi are not in the kingdom Plantae is that fungi\_\_\_\_\_.
- A. Are chemoorganotrophic heterotrophs.
  - B. Have unicellular and multi-cellular forms.
  - C. Are procaryotes.
  - D. Are eucaryotes.

ANSWER: A

29. Which of the following structures would not be associated with fungi?
- A. Mitochondria.
  - B. Cell walls.
  - C. Chloroplasts.
  - D. Spores.

ANSWER: C

30. Deuteromycota is a group of organism that has all the following except\_\_\_\_\_.
- A. Cell walls with chitin.
  - B. Asexual spores.
  - C. Absorptive nutrition.
  - D. Sexual reproduction.

ANSWER: D

31. \_\_\_\_\_ produce basidiospores.
- A. Slime molds.
  - B. Dimorphic fungi.
  - C. Club fungi .
  - D. Black bread molds.

ANSWER: C

32. \_\_\_\_\_ produce ascospores in an ascus.
- A. Slime molds.
  - B. Dimorphic fungi.
  - C. Club fungi.
  - D. Sac fungi.

ANSWER: D

33. Which of the following describes the function of a secretory vacuole?
- A. Sites of food digestion.
  - B. Contain specific enzymes that perform various functions.
  - C. Maintain osmotic balance by continuous water expulsion.
  - D. Structures that accept male gametes during sexual reproduction.

ANSWER: A

34. Holozoic nutrition is characterized by\_\_\_\_\_.
- A. Phagocytosis of solid nutrients and subsequent formation of phagocytic vacuoles.
  - B. Pinocytosis of solid nutrients and subsequent formation of phagocytic vacuoles.
  - C. Phagocytosis of soluble nutrients and subsequent formation of phagocytic vacuoles.
  - D. Engulfment of solid nutrients and subsequent formation of secretory vacuoles.

ANSWER: A

35. Saprozoic nutrition is characterized by\_\_\_\_\_.
- A. Phagocytosis of solid nutrients and subsequent formation of phagocytic vacuoles.
  - B. Pinocytosis of solid nutrients and subsequent formation of phagocytic vacuoles.
  - C. Pinocytosis of soluble nutrients and subsequent formation of phagocytic vacuoles.
  - D. Engulfment of solid nutrients and subsequent formation of secretory vacuoles.

ANSWER: D

36. Organisms which have spore-forming stage in their life cycle and lack special locomotory organelles belong to which phylum of Protozoa?

- A. Sarcomastigophora.
- B. Labyrinthomorpha.
- C. Apicomplexa.
- D. Myxozoa.

ANSWER: D

37. The fungus responsible for ergotism belongs to which of the following fungal divisions?

- A. Ascomycota.
- B. Basidiomycota.
- C. Deuteromycota.
- D. Oomycota.

ANSWER: D

38. Which algal division never produces motile, flagellated cells among any of its members?

- A. Chlorophyta.
- B. Chrysophyta.
- C. Phaeophyta.
- D. Pyrrophyta.

ANSWER: A

39. Zooxanthellae are algal symbiosis belongs to the algal division?

- A. Chlorophyta.
- B. Chrysophyta.
- C. Phaeophyta.
- D. Pyrrophyta.

ANSWER: D

40. Bioluminescence is a phenomenon associated with which algal division?

- A. Chlorophyta.
- B. Chrysophyta.
- C. Phaeophyta.
- D. Pyrrophyta.

ANSWER: D

41. Frustules made of silica are characteristic of which group of algae?

- A. Euglenoids.
- B. Diatoms.
- C. Desmids.
- D. Seaweeds.

ANSWER: B

42. Protozoans that use whip-like structure used for locomotion are called\_\_\_\_\_.

- A. Cilia
- B. Flagella
- C. Pseudopodia
- D. Pellicle

ANSWER: B

43. The specific binding of the HIV to the CD4+ host cells is brought about by \_\_\_\_\_.

- A. gp120.
- B. gp130.
- C. gp140.
- D. gp150.

ANSWER: A

44. The pol gene does not encode for which of the following enzymes?

- A. Protease.
- B. Integrase.
- C. Reverse transcriptase.
- D. RNA polymerase.

ANSWER: D

45. Father of antiseptic surgery is -----

- A. Joseph Lister
- B. Pasteur
- C. Edward Jenner
- D. All.

ANSWER: A

46. Which of the following does not kill endospores?

- A. Autoclave .
- B. Incineration.
- C. Hot air sterilization.
- D. Pasteurization.

ANSWER: D

47. Sweet and salty foods frequently don't require refrigeration to prevent spoilage because they have\_\_\_\_\_.

- A. Insufficient nutrients.
- B. Low pH.
- C. High concentration of solutes.
- D. Toxic alkaline chemicals.

ANSWER: C

48. Which of the following disinfectants acts by disrupting microbial membranes?

- A. Cationic detergents .
- B. Halogens.
- C. Heavy metals.
- D. Aldehydes.

ANSWER: A

49. Robert Koch made many contributions to the study of Microbiology. One discovery that was important in allowing us to study microbes was his\_\_\_\_\_.

- A. Use of agar to grow microbes in the lab.
- B. Invention of the petri dish.
- C. Experiments with smallpox.
- D. Discovery of penicillin.

ANSWER: A

50. The experimental material taken by Griffiths was \_\_\_\_\_.

- A. T2 bacteriophage.
- B. Escherichia coli.
- C. Diplococcus pneumoniae.
- D. Penicillium notatum.

ANSWER: C

51. T4 is related to

- A. Fungi
- B. Algae
- C. Bacteria
- D. Bacteriophage

ANSWER: D

52. Vinegar is manufactured by the oxidation of \_\_\_\_\_.

- A. Alcohol.
- B. Aldehyde.
- C. Carbohydrate.
- D. Acid.

ANSWER: A

53. Yeast which is not used for food purposes is \_\_\_\_\_.

- A. Candida albicans.
- B. Candida lipolytica.
- C. Candida utilis.
- D. Saccharomyces cerevisiae.

ANSWER: A

54. Yeast produced chiefly to feed animals is called \_\_\_\_\_.

- A. Food yeast.
- B. Fodder yeast.
- C. Animal yeast.
- D. Dry yeast.

ANSWER: B

55. Many individuals of the same species living together in a defined area form a/an \_\_\_\_\_.

- A. Community.
- B. Genus.
- C. Population.
- D. Ecosystem.

ANSWER: A

56. An ecosystem is comprised of \_\_\_\_\_.

- A. Solely nonliving components.
- B. Living and nonliving components that do not interact.



- C. Living and nonliving components that continually interact.
- D. Living and nonliving components that sometimes interact.

ANSWER: C

57. The largest reservoir of carbon is the\_\_\_\_\_.

- A. Soil.
- B. Atmosphere.
- C. Ocean.
- D. Vegetation.

ANSWER: C

58. The boundaries between biomes (ecotones) are usually seen as\_\_\_\_\_.

- A. Gradual transition zones.
- B. Abrupt changes in vegetation, but not of animals.
- C. Abrupt changes in both vegetation and animals.
- D. Distinct topographic barriers such as mountains and rivers.

ANSWER: A

59. Which of the following lists contains all the ingredients and products of photosynthesis?

- A. Carbon dioxide, water, oxygen, and carbohydrates.
- B. Oxygen, nitrogen, water, and carbohydrates.
- C. Phosphorus, water, carbon dioxide, and oxygen.
- D. Carbohydrates, water, nitrogen, and carbon dioxide.

ANSWER: A

60. Why is it difficult to integrate nitrogen gas from the atmosphere into the nitrogen cycle of the biosphere?

- A. Nitrogen is not very abundant in the atmosphere.
- B. Few organisms can directly utilize atmospheric nitrogen gas.
- C. Most plants do not require organic nitrogen compounds for survival.
- D. Oceans quickly absorb nitrogen gas.

ANSWER: B

61. What human activity has added the most carbon to the atmosphere?

- A. Burning fossil fuels.
- B. Mining fossil fuels.
- C. Cutting down the rain forests.
- D. Increasing soil erosion.

ANSWER: A

62. Which of the following factors influences biotic distributions?

- A. Moisture.
- B. Wind.
- C. Temperature.
- D. all the above.

ANSWER: D

63. The biosphere encompasses the total \_\_\_\_\_ of living material in a region or the globe.

- A. Diversity of species.
- B. Phyla.
- C. Photosynthesis.

D. Weight.  
ANSWER: D

64. In nutrient cycles in general, minerals tend to be dispersed through \_\_\_\_\_.  
A. Plant action.  
B. Surface and subsurface runoff.  
C. Assimilation.  
D. Conduction.

ANSWER: B

65. Soil chemistry is considered a \_\_\_\_\_ factor.  
A. Topographic.  
B. Econtonal.  
C. Biologic.  
D. Edaphic.

ANSWER: D

66. Coliform test is meant for testing the presence of -----.  
A. E.coli  
B. Eubacteria  
C. Eukaryote  
D. None

ANSWER: A

67. 98% of oxygen in the atmosphere comes from \_\_\_\_\_.  
A. Photosynthesis.  
B. The weathering of rocks.  
C. Water from plant transpiration.  
D. Krebs cycle.

ANSWER: D

68. The nitrogen fixing phenomenon is known as \_\_\_\_\_.  
A. Nitroazotrophy.  
B. Nitrotrophy.  
C. Azotrpphy.  
D. Diazotrophy.

ANSWER: D

69. In global biome patterns, general \_\_\_\_\_ characteristics are the most important factor affecting distribution.  
A. geologic.  
B. topographic.  
C. climatic.  
D. soil.

ANSWER: B

70. Obligatory relationship, Highly specific & cannot be replaced by another partner is-----.  
A. symbiosis  
B. synergism  
C. competition  
D. predation.

ANSWER: A

71. A method of pure culturing bacteria by means of an agar plates and an inoculating loop is \_\_\_\_\_.
- A. Streak plate.
  - B. Pour plate.
  - C. Spread plate.
  - D. Serial dilution plating.

ANSWER: A

72. A medium that encourages the growth of some organisms but suppresses others is \_\_\_\_\_.
- A. Enrichment.
  - B. Selective.
  - C. Differential.
  - D. Nutrient.

ANSWER: B

73. \_\_\_\_\_ media are widely used to discriminate closely related organisms or groups of organisms.
- A. Enrichment.
  - B. Selective.
  - C. Differential.
  - D. Nutrient.

ANSWER: C

74. Pure culture of microorganism is called\_\_\_\_\_.
- A. Synchronous culture.
  - B. Axenic culture.
  - C. Diauxenic culture.
  - D. Continuous culture.

ANSWER: B

75. Which type of media is used for fungi cultivation?
- A. Non nutrient agar.
  - B. MacConkey's agar.
  - C. Sabouraud's dextrose agar.
  - D. RPMI.

ANSWER: C

76. Many microbes when moved from anaerobic to aerobic conditions, will drastically reduce their rate of sugar catabolism and switch over to aerobic respiration. The phenomenon is called as\_\_\_\_\_.
- A. Pasteur effect.
  - B. Robert Koch effect.
  - C. Leevenhoeks effect.
  - D. Redis effect.

ANSWER: A

77. \_\_\_\_\_ is referred as non ionizing radiation.
- A. UV rays.
  - B. X rays.
  - C. Gamma rays.
  - D. Cathode rays.

ANSWER: A

78. \_\_\_\_\_ is referred as biological indicator of autoclave.

- A. Bacillus stearothermophilus.
- B. Bacillus subtilis.
- C. Bacillus megatorium.
- D. Bacillus cereus.

ANSWER: A

79. Example for symbiotic N<sub>2</sub> fixation is -----.

- A. Azotobacter
- B. Acetobacter
- C. Rhizobium
- D. None

ANSWER: C

80. Microbes such as E.coli are able to manufacture vitamin \_\_\_\_\_ in the human intestinal tract.

- A. A.
- B. D
- C. C
- D. K

ANSWER: D

81. \_\_\_\_\_ seem to be the most efficient at degradation of non-biological chemicals.

- A. Algae.
- B. Animals.
- C. Bacteria.
- D. Fungi.

ANSWER: D

82. Which of the following best describes biodegradation?

- A. A minor change in an organic molecule.
- B. Fragmentation of a complex organic molecule.
- C. Complete transformation of the organic molecule to mineral forms.
- D. All of the above.

ANSWER: D

83. Antibiotics tend to be \_\_\_\_\_.

- A. Primary metabolites.
- B. Secondary metabolites
- C. Tertiary metabolites
- D. Quaternary metabolites.

ANSWER: B

84. The primary purpose of sewage treatment plants is to remove the \_\_\_\_\_ from sewage.

- A. Organic matter.
- B. Inorganic matter.
- C. Stones.
- D. Chemicals.

ANSWER: A

85. The anaerobic organism in an anaerobic sludge digester produce various metabolic end products

including acetate, hydrogen gas and carbondioxide which are converted to \_\_\_\_\_ by methanogens.

- A. Methane.
- B. Methanol.
- C. Ethane.
- D. Ethanol.

ANSWER: A

86. Tertiary treatment is sometimes used to reduce the concentration of ions like\_\_\_\_\_.

- A. Potassium and calcium ions.
- B. Calcium and nitrate ions.
- C. Potassium and nitrate ions.
- D. Phosphate and nitrate ions.

ANSWER: D

87. Fungi degrade cellulose bacteria utilizes the glucose is an example for\_\_\_\_\_.

- A. Mutualism.
- B. Antagonism.
- C. Commensalims.
- D. Predation.

ANSWER: C

88. Protozoa grazing on bacteria is an example for\_\_\_\_\_.

- A. Mutualism.
- B. Antagonism.
- C. Commensalims.
- D. Predation.

ANSWER: D

89. Lichens are an example for\_\_\_\_\_.

- A. Mutualism.
- B. Antagonism.
- C. Commensalims.
- D. Predation.

ANSWER: A

90. Lytic enzymes of myxobacteria\_\_\_\_\_.

- A. Mutualism.
- B. Antagonism.
- C. Parasitism.
- D. Predation.

ANSWER: B

91. Conversion of gaseous nitrogen to ammonia is \_\_\_\_\_.

- A. Nitrification
- B. Nitrogenase
- C. Peptidase
- D. Deaminase

ANSWER: B

92. Conversion of substrate to peptide is by\_\_\_\_\_.

- A. Nitrification .

- B. Nitrogenase.
- C. Peptidase.
- D. Deaminase.

ANSWER: C

93. Conversion of substrate to ammonia and organic acid is by\_\_\_\_\_.

- A. Nitrification.
- B. Nitrogenase.
- C. Peptidase.
- D. Deaminase.

ANSWER: A

94. Conversion of ammonia to nitrate is called as\_\_\_\_\_.

- A. Nitrification.
- B. Nitrogenase.
- C. Peptidase.
- D. Deaminase.

ANSWER: A

95. Conversion of substrate to aminoacids\_\_\_\_\_.

- A. Nitrification.
- B. Proteolysis.
- C. Peptidase.
- D. Deaminase.

ANSWER: B

96. The methods of examining water bacteriologically are contained in the book\_\_\_\_\_.

- A. Standard methods for the examination water and wastewater.
- B. Statistical methods for the examination of water and wastewater.
- C. Statistical methods for the examination of water.
- D. Standard methods for the examination water.

ANSWER: A

97. Suspended solids in the waste water consists of \_\_\_\_\_.

- A. 1-100ppm.
- B. 100-1000ppm.
- C. 1000-10,000ppm.
- D. 10,000-1,00,000ppm.

ANSWER: A

98. The strength of waste water is represented by \_\_\_\_\_.

- A. BOD.
- B. COD.
- C. Metals.
- D. MPN.

ANSWER: A

99. The material which accumulates at the bottom of the sedimentation tank is called as \_\_\_\_\_.

- A. Sludge.
- B. Settlement.
- C. Alumina.

D. Casolina.

ANSWER: A

100. The small solids and pebbles in primary water treatment are removed by\_\_\_\_\_.

- A. Screening.
- B. Grit chambers.
- C. Sedimentation.
- D. Trickling filters.

ANSWER: B

101. Clostridium has been isolated from the \_\_\_\_\_ of red-meat animals.

- A. Skin.
- B. Blood.
- C. Lymphonodes.
- D. Feces.

ANSWER: C

102. Undesirable microorganisms like psychrotrophic bacteria can cause contamination of meat during \_\_\_\_\_ storage.

- A. Chilling.
- B. High temperature.
- C. Chemical.
- D. None of the above.

ANSWER: A

103. Mucor, Cladosporium, Thamnidium are the organisms that contaminate meat which are the examples of \_\_\_\_\_.

- A. Bacteria.
- B. Virus.
- C. Molds.
- D. Protozoa.

ANSWER: C

104. Bacterial genera like Pseudomonas, Alcaligenes, and Micrococcus can grow at \_\_\_\_\_ temperatures.

- A. High temperature.
- B.
- C.
- D. Chilling.

ANSWER: D

105. Films used to wrap meats \_\_\_\_\_ bacteria and affect the growth of those already there.

- A. Decrease.
- B. Increase.
- C. Keep out.
- D. Retains.

ANSWER: C

106. Chemicals added to meats, such as spices, salt or nitrates and nitrites in \_\_\_\_\_ processes.

- A. Chilling.
- B. Storage.

- C. Evacuation.
- D. Curing.

ANSWER: D

107. \_\_\_\_\_ in meat help kill spores of anaerobic bacteria by heat and inhibit germination of surviving spores.

- A. Phosphorous.
- B. Sulphur.
- C. Nitrates.
- D. Nitrites.

ANSWER: C

108. Normal microflora in milk is-----.

- A. Lactobacillus
- B. Vibrio
- C. Mycobacterium
- D. Nocardia.

ANSWER: A

109. Which one of the following is NOT an example for meat product?

- A. Pickle.
- B. Dry sausages.
- C. Dry salamis.
- D. Dry cervelats.

ANSWER: A

110. \_\_\_\_\_ also plays a role in the color of meats.

- A. Phosphorous.
- B. Nitrate.
- C. Sulphur.
- D. Oxides.

ANSWER: B

111. \_\_\_\_\_ is the term implies a sour odor and perhaps taste.

- A. Souring.
- B. Acidity.
- C. Alkalinity.
- D. None of the above.

ANSWER: A

112. Which of the following stimulate membrane fusion process?

- A. PEG
- B. EG
- C. GEP
- D. PE

ANSWER: A

113. Lipopolysaccharides are also called as \_\_\_\_\_.

- A. Endotoxin.
- B. exotoxin.
- C. polytoxin.



D. toxoids.  
ANSWER: A

114. Genetic engineering improved the activity of subtilism at the strongly alkaline pH of \_\_\_\_\_ manufacture.

- A. detergents.
- B. cheese.
- C. therapeutic.
- D. soft drink

ANSWER: A

115. The term \_\_\_\_\_ is applied to any off-taste or off odor.

- A. Curing.
- B. Preservation.
- C. Taint.
- D. Salting.

ANSWER: C

116. The incidence of \_\_\_\_\_ on poultry carcasses and the role of poultry processing in transmitting \_\_\_\_\_ have received considerable attention.

- A. Salmonellae, Salmonellosis.
- B. Shigella, Shigellosis.
- C. Staphylococcus, skin infections.
- D. None of the above.

ANSWER: A

117. There is a high incidence of \_\_\_\_\_ in poultry processing plants and on the processed bird.

- A. Camphylobacter jejuni.
- B. Psuedomonas putida.
- C. E. coli.
- D. Staphylococcus sp.,

ANSWER: A

118. Most poultry is preserved by -----.

- A. Irradiation.
- B. Chilling.
- C. Chemicals.
- D. High temperature.

ANSWER: B

119. Poultry can be kept in good condition for months if ----- is prompt.

- A. Irradiation.
- B. Chemicals.
- C. Freezing.
- D. Asepsis.

ANSWER: C

120. Salt tolerant organisms are called as \_\_\_\_\_.

- A. Saccharolytic organisms.
- B. Halophilic organisms.
- C. Proteolytic organisms.

D. Thermophilic organisms.

ANSWER: B

121. Example for halophilic bacteria is \_\_\_\_\_.

- A. E. coli.
- B. Enterotoxigenic E. coli.
- C. Alcaligenes.
- D. Streptococcus sp.

ANSWER: C

122. Many of the microbiological spoilage problems in vegetables are really \_\_\_\_\_.

- A. Infection.
- B. Contamination.
- C. Market diseases.
- D. None of the above.

ANSWER: C

123. Sorting spoiled fruits or vegetables or trimming spoiled parts removes \_\_\_\_\_.

- A. Microorganisms.
- B. Infection.
- C. Contamination.
- D. Diseases.

ANSWER: A

124. Adequate \_\_\_\_\_ at the plant causes a reduction in number of microorganisms on the food prepared from vegetables.

- A. Asepsis.
- B. Chemical application.
- C. Temperature.
- D. Washing.

ANSWER: D

125. What is blanching?

- A. Removal of microorganisms.
- B. Keep out of microorganisms.
- C. Killing of microorganisms.
- D. Heating to inactivate enzymes.

ANSWER: D

126. Sweating of vegetables products during handling increases \_\_\_\_\_.

- A. Microbial numbers.
- B. Acidity.
- C. Temperature.
- D. None of the above.

ANSWER: A

127. \_\_\_\_\_ of grapes before extraction reduces number of organisms in the expressed juice, but pressing introduces contamination.

- A. Chilling.
- B. Heating.
- C. Ripening.

D. None of the above.

ANSWER: B

128. LTH in pasteurization stands for-----

- A. Light to Heavy
- B. Low temperature holding
- C. Low time holding
- D. All

ANSWER: B

129. Organisms that grow well between 20 C and 45 C with optima between 30 C and 40 C are referred to as \_\_\_\_\_.

- A. Psychrotrophs.
- B. Mesophiles.
- C. Thermophiles.
- D. Halophiles.

ANSWER: B

130. Appertization is used to kill microorganisms in -----

- A. Food.
- B. Water.
- C. Soil.
- D. None.

ANSWER: A

131. The killing of microorganisms by heat is supposed to be caused by \_\_\_\_\_.

- A. Proteins
- B. Enzymes.
- C. Nucleic acids.
- D. None of the above.

ANSWER: A

132. The heat resistance of microorganisms usually is expressed in terms of \_\_\_\_\_.

- A. Thermal death point.
- B. Thermal death time
- C. Thermal death rate
- D. None of the above.

ANSWER: B

133. The rate of killing of microorganisms is expressed in terms of \_\_\_\_\_.

- A. Thermal death point.
- B. Thermal death time
- C. Thermal death rate
- D. Absolute thermal death time.

ANSWER: C

134. \_\_\_\_\_ may be pasteurized for 1 min at 82-85 degrees Celsius in bulk.

- A. Milk.
- B. Grape wine.
- C. Water.
- D. Fruit wine

ANSWER: B

135. Clostridium botulinum causes

- A. Botulism
- B. Typhoid
- C. Cholera
- D. All

ANSWER: A

136. \_\_\_\_\_ is incipient or gentle boiling, with the temperature about 100 degrees Celsius.

- A. Baking.
- B. Roasting.
- C. Frying.
- D. Simmering.

ANSWER: D

137. \_\_\_\_\_ gets the outside of the food very hot, but the center ordinary does not reach 100 degrees Celsius.

- A. Baking
- B. Frying
- C. Roasting
- D. Simmering

ANSWER: B

138. In the food industry, the term \_\_\_\_\_ implies a specific time and temperature for a thermal process

- A. Dry.
- B. Fry.
- C. Cook.
- D. Heat.

ANSWER: C

139. \_\_\_\_\_ a food may mean anything from a small increase in temperature up to heating to 100 degrees Celsius.

- A. Baking.
- B. Roasting.
- C. Cooking.
- D. Warming up.

ANSWER: D

140. Canning is often replaced by \_\_\_\_\_.

- A. Tankers.
- B. Hermetically sealed containers.
- C. Flask.
- D. None of the above.

ANSWER: B

141. All are fermented products except \_\_\_\_\_.

- A. Antibiotics.
- B. Beverages.
- C. Enzymes.
- D. Softdrinks.

ANSWER: D

142. The detection and isolation of high yielding strains from the natural resources, such as soil, is called \_\_\_\_\_.

- A. Selection.
- B. Screening.
- C. Identification.
- D. Improvement.

ANSWER: B

143. screening programmes include \_\_\_\_\_.

- A. Primary screening.
- B. Secondary screening.
- C. Primary and secondary screening.
- D. Quartnary screening.

ANSWER: C

144. Primary screening programmes serve to \_\_\_\_\_.

- A. Select industrially useful microorganism.
- B. Use simple technique
- C. Apply fundamental principle
- D. Identify new organism.

ANSWER: A

145. ----- is useful in screening of microorganisms capable of producing organic acids, amines, vitamins, etc.

- A. Primary screening
- B. Secondary screening
- C. Tertiary screening
- D. Quaternary screening.

ANSWER: A

146. \_\_\_\_\_ is the simplest screening technique employed in detecting and isolating antibiotic producers.

- A. Crowded plate technique.
- B. Auxanography
- C. Enrichment culture technique
- D. Use of an indicator dye.

ANSWER: A

147. The pH indicating dyes may be employed in some screening methods for detecting microorganisms capable of producing \_\_\_\_\_.

- A. Amines.
- B. Organic acids or amines
- C. Organic acids
- D. Aminoacid.

ANSWER: B

148. Who designed the Enrichment Culture technique?

- A. Pasteur.
- B. Beijerinck.

C. Hook.

D. Jenner.

ANSWER: B

149. The zone of stimulated growth can be seen in\_\_\_\_\_.

A. Amine producers.

B. Antibiotic producers.

C. Growth factor producers

D. Acid producers.

ANSWER: C

150. \_\_\_\_\_ is employed for detecting microorganisms able to produce growth factors extracellularly.

A. Use of an indicator dye.

B. Auxanography.

C. Enrichment culture technique

D. Crowded plate technique.

ANSWER: B

151. The formation of inhibitory zones around certain colonies is the indication of \_\_\_\_\_.

A. Antibiotic producers

B. Vitamin producers.

C. Growth factor producers

D. Acid producers.

ANSWER: A

152. The colonies surrounded by a clear zone on the surface of nutrient agar containing casein at pH 10-12.

A. Amylase producers.

B. Alkaline proteases producers

C. Antibiotic producers

D. Vitamin producers.

ANSWER: B

153. Secondary metabolites are\_\_\_\_\_of the microorganism.

A. Growth stimulators

B. Life.

C. Components.

D. Not essential for growth and reproduction

ANSWER: D

154. The term 'fermentation' is derived from the Latin verb fervere. What is the meaning of this word?

A. To produce

B. To act.

C. To boil.

D. To ferment

ANSWER: C

155. The success of a screening program depends on\_\_\_\_\_.

A. Kinds of organisms

B. Methods for detection of activity.

C. Both kinds of organisms and methods

D. Influence of sources

ANSWER: C

156. The enrichment method like extreme pH values (pH 2-4) used to isolate\_\_\_\_\_.

- A. Psychrophiles.
- B. Acidophiles.
- C. Mesophiles.
- D. Alkalophiles.

ANSWER: B

157. The enrichment method like High NaCl concentrations used to isolate\_\_\_\_\_.

- A. Halophiles.
- B. Acidophiles
- C. Mesophiles
- D. Alkalophiles

ANSWER: A

158. The enrichment method like Low temperatures (4-15 C) used to isolate\_\_\_\_\_.

- A. Psychrophiles.
- B. Acidophiles
- C. Mesophiles
- D. Alkalophiles

ANSWER: A

159. Crowded plate technique is -----.

- A. Primary Screening.
- B. Secondary Screening.
- C. Both.
- D. None.

ANSWER: A

160. Agar plates with casein, used for the selection of colonies which produce clear zones on the turbid plates?

- A. Amylases.
- B. Proteases.
- C. Lipases.
- D. Phosphatases.

ANSWER: B

161. Strain improvement is done by\_\_\_\_\_.

- A. Isolation.
- B. Cultivation
- C. Mutation.
- D. Freezing.

ANSWER: C

162. \_\_\_\_\_is the recombination techniques also useful in improvement of strains.

- A. Transformation.
- B. Restriction.
- C. Mapping.
- D. Deletion.

ANSWER: A

163. The primary goal of an industrial strain development program is the\_\_\_\_\_.
- A. Increase in the yield
  - B. Increase in the growth.
  - C. Increase in the conditions
  - D. Increase in the yield of the desired product.

ANSWER: D

164. Use of genetic methods in the strain development are\_\_\_\_\_.
- A. Strain optimization
  - B. Quality change in the spectrum of antibiotics.
  - C. Production of modified secondary metabolites
  - D. All the above

ANSWER: D

165. Molasses used as\_\_\_\_\_ source.
- A. C
  - B. N
  - C. P
  - D. M

ANSWER: A

166. Which substrate used as N source?
- A. Corn steep liquor
  - B. Malt extract.
  - C. Ethonal.
  - D. Starch.

ANSWER: A

167. A batch fermentation can be considered to be a\_\_\_\_\_system.
- A. Open.
  - B. Closed.
  - C. Verical.
  - D. Tubular.

ANSWER: B

168. Citric Acid produced by----- fermentation.
- A. Surface.
  - B. Deep.
  - C. Both Aand B
  - D. None.

ANSWER: C

169. The substrate is metabolized or toxic substances have been formed, growth slows down or is completely stopped is\_\_\_\_\_.
- A. Lag
  - B. Log
  - C. Stationary
  - D. Death

ANSWER: C



170. \_\_\_\_\_ phase the energy reserves of the cells are exhausted.

- A. Stationary
- B. Log
- C. Lag
- D. Death

ANSWER: D

171. In the \_\_\_\_\_ process, substrate is added in increments as the fermentation progresses.

- A. Continuous.
- B. Batch.
- C. Fed-batch.
- D. Solid state.

ANSWER: C

172. In the fed-batch method the critical elements of the nutrient solution are added in \_\_\_\_\_ concentrations at the beginning of the fermentation.

- A. Small.
- B. Large.
- C. Very large.
- D. Little.

ANSWER: A

173. In the production of organic acids, the pH value may be used to determine the rate of \_\_\_\_\_ feeding.

- A. Nitrogen.
- B. Glucose.
- C. Amino acids.
- D. Lipids.

ANSWER: B

174. In fermentations with critical osmotic values, feeding can be regulated by monitoring the \_\_\_\_\_ content in the exhaust air.

- A. pO<sub>2</sub>-value.
- B. CO<sub>2</sub>.
- C. CO.
- D. pO<sub>2</sub>-value or the CO<sub>2</sub>.

ANSWER: D

175. In \_\_\_\_\_ fermentation, sterile nutrient solution is added to the bioreactor continuously and an equivalent amount of converted nutrient solution with microorganisms is simultaneously taken out of the system.

- A. Continuous.
- B. Batch.
- C. Fed-batch.
- D. Solid state.

ANSWER: A

176. Homogenously mixed bioreactor and Plug Flow Reactor are the two basic types of \_\_\_\_\_ fermentation.

- A. Solid state

- B. Fed-batch
- C. Continuous
- D. Batch

ANSWER: C

177. Which type of reactor is run as either a chemostat or a turbitostat.

- A. Homogenously mixed bioreactor.
- B. Plug Flow Reactor
- C. Tower reactor
- D. Tubular reactor.

ANSWER: A

178. In the ----- cell growth is controlled by adjusting the concentration of one substrate.

- A. Turbitostat.
- B. Chemostat.
- C. Stechiostat.
- D. Thermostat.

ANSWER: B

179. In the ----- cell growth is kept constant by using turbidity to monitor the biomass concentration and the rate of feed of nutrient solution is appropriately adjusted.

- A. Idiostat.
- B. Thermostate.
- C. Chemostat.
- D. Turbitostat

ANSWER: D

180. In which type of continuous fermentation, the culture solution flows through a tubular reactor without back mixing.

- A. Homogenously mixed bioreactor
- B. Plug Flow Reactor
- C. Tower reactor
- D. Tubular reactor.

ANSWER: B

181. Penicilin is commercially produced by

- A. *P. notatum*
- B. *P. chrysogenum*
- C. *P. citrinum*
- D. *P. roquefortii*

ANSWER: B

182. In a continuous process under steady state conditions, cell loss as a result of outflow must be balanced by \_\_\_\_\_ of the organism.

- A. Growth.
- B. Addition.
- C. Supplementation.
- D. Stimulation.

ANSWER: A

183. The \_\_\_\_\_ vessel is the best understood and most widely used bioreactor and is quite flexible.

- A. Stirrer.
- B. Gas phase.
- C. Pressure.
- D. Pump.

ANSWER: A

184. Which of the following is the best definition of fermentation?

- A. The reduction of glucose to pyruvic acid
- B. The oxidation of glucose with organic molecules serving as electron acceptors
- C. The complete catabolism of glucose to carbon dioxide and water.
- D. The production of energy by substrate-level phosphorylation.

ANSWER: B

185. Continuous feed during fermentation is used to maintain

- A. Temperature.
- B. Water level.
- C. Product concentration
- D. Substrate concentration.

ANSWER: D

186. Wine is made from fruit juices by

- A. The addition of alcohol.
- B. Bacterial production of carbon dioxide.
- C. The addition of sugar
- D. Anaerobic fungal growth.

ANSWER: D

187. Which of the following is an undesirable contaminant in wine making?

- A. Acetobacter.
- B. Lactic acid bacteria.
- C. Clostridium.
- D. Bacillus.

ANSWER: A

188. Water soluble vitamin B12 is also called

- A. Cobalamin.
- B. Thiamine.
- C. Niacin
- D. Riboflavin

ANSWER: A

189. All of the following are industrial products produced by microbes except

- A. Amino acids in food supplements.
- B. Antibiotics.
- C. Industrial enzymes
- D. Uranium

ANSWER: D

190. Methane made from biomass is produced by

- A. Anaerobic respiration.
- B. Fermentation

C. The Krebs cycle.

D. Oxidation.

ANSWER: A

191. Which of the following pairs is mismatched?

A. Propionibacterium - Swiss cheese

B. Penicillium- blue cheese

C. Streptococcus- yogurt.

D. Bacillus- hard cheese.

ANSWER: D

192. The use of \_\_\_\_\_ in citric acid production dates back to 1917.

A. Aspergillus niger.

B. Aspergillus oryzae.

C. Yeast.

D. Lactobacillus casei

ANSWER: A

193. Optimum pH for the growth of yeast in alcohol production is\_\_\_\_\_.

A. 4-4.5.

B. 4.8-5.

C. 5-6.

D. 6-7.

ANSWER: B

194. Alcohol fermentation is \_\_\_\_\_process

A. Anaerobic.

B. Aerobic.

C. Facultative anaerobic.

D. Microaerophilic.

ANSWER: A

195. In alcohol fermentation, fermented liquid is\_\_\_\_\_.

A. Must.

B. Steep.

C. Wash.

D. Mash.

ANSWER: C

196. Strain Streptomyces olivaceus used for the production of\_\_\_\_\_.

A. B12.

B. Alcohol.

C. Amylase.

D. Citric acid

ANSWER: A

197. Which one paved a way for present day molecular biotechnology?

A. Genes of frog could be successfully transplanted and expressed in E.coli.

B. Production of new recombinant plasmids

C. Only a.

D. Both a and b.

ANSWER: D

198. Streptomycin is a -----.

- A. Antibiotic
- B. Pesticide
- C. Fungicide
- D. Insecticide

ANSWER: A

199. Cloning in Bacillus as vectors is possible due to \_\_\_\_\_.

- A. Secrete proteins
- B. Absolutely pathogenic
- C. Obligate anaerobes.
- D. Mutants forms.

ANSWER: A

200. Which one of the plasmid that is widely used from Streptomyces lividans?

- A. pBR322.
- B. pHB14.
- C. pIJ101.
- D. pIJ104.

ANSWER: C

201. Which selectable markers have more advantages in selection process by using yeast?

- A. ura3 and lys2.
- B. amp R and tet R.
- C. ura3 and ura5.
- D. amp R and kan R

ANSWER: A

202. Which one is a plasmid vector for use in fungi?

- A. Yeast episomal plasmids
- B. Yeast replicating plasmids.
- C. Yeast centromere plasmids
- D. All the above.

ANSWER: D

203. Why is it is theoretically possible for a gene from any organism to function in any other organism?

- A. Ribosomes.
- B. Same genetic code.
- C. Made up of cells.
- D. Similar nuclei.

ANSWER: B

204. Plasmids are important in biotechnology because they are \_\_\_\_\_.

- A. a vehicle for the insertion of recombinant DNA into bacteria.
- B. surfaces for respiratory processes in bacteria
- C. recognition sites on recombinant DNA strands.
- D. surfaces for protein synthesis in eukaryotic recombinants.

ANSWER: A

205. If you discovered a bacterial cell that contained no restriction enzymes, which of the following would you expect to happen?

- A. not easily transformable.
- B. create incomplete plasmids.
- C. unable to replicate its DNA.
- D. easily infected and lysed by bacteriophages.

ANSWER: D

206. Which two enzymes are needed to produce recombinant DNA?

- A. Endonuclease, transcriptase.
- B. DNA polymerase, topoisomerase
- C. Restriction enzyme, ligase.
- D. Polymerase, ligase.

ANSWER: C

207. What is a cloning vector?

- A. An agent, such as a plasmid, used to transfer DNA from an in vitro solution into a living cell.
- B. The sticky end of a DNA fragment.
- C. The laboratory apparatus used to clone genes.
- D. A DNA probe used to locate a particular gene in the genome

ANSWER: A

208. What are the essential characteristics of a cloning vector?

- A. Bacterial cells cannot survive without it.
- B. Bacterial cells replicate it
- C. Bacterial cells take it up.
- D. Both B and C are correct.

ANSWER: B

209. Which one is an essential feature of a suitable plasmid vectors?

- A. Large size.
- B. Ori,inc and par genes
- C. Restriction sites.
- D. Single copy nature.

ANSWER: B

210. Small piece of DNA into which a foreign DNA fragment can be inserted is called as \_\_\_\_\_.

- A. Probe.
- B. Oligonucleotide
- C. Phage.
- D. Cloning vectors

ANSWER: D

211. \_\_\_\_\_ allows protein expression, tagging, single stranded RNA and DNA production and a host of other manipulations.

- A. Vectors.
- B. Ligases.
- C. Nucleases.
- D. Polymerases.

ANSWER: A

212. Blue/white screening possible on culture plate because of the presence of \_\_\_\_\_.

- A. X-gal.
- B. DBM.
- C. Crystal violet.
- D. Methylene blue

ANSWER: A

213. Cell lysis achieved by \_\_\_\_\_ the sample.

- A. Sonication.
- B. Electrophoresis.
- C. PCR.
- D. RFLP.

ANSWER: A

214. Multiple cloning sites are called as \_\_\_\_\_ sequence.

- A. Polylinker.
- B. MPN.
- C. cDNA.
- D. X-gal.

ANSWER: A

215. Cosmid is a hybrid of \_\_\_\_\_.

- A. ? phage DNA and bacterial plasmid.
- B. M13 phage DNA and bacterial plasmid.
- C. Two different plasmid DNAs.
- D. Two different phage DNAs

ANSWER: A

216. \_\_\_\_\_ represents that vector is capable of surviving and replicated in two different species or more than one organisms.

- A. Expression vector
- B. Shuttle vector
- C. Cassette vector
- D. Clonal vector.

ANSWER: B

217. Example for expression vector is \_\_\_\_\_.

- A. PBR322
- B. BAC vectors.
- C. PUC vectors.
- D. Lambda vectors

ANSWER: B

218. The \_\_\_\_\_ promoter that is used in shuttle vectors, so that synthesis of the gene product can be regulated.

- A. Expressive.
- B. Optimizable.
- C. Inducible.
- D. Productive.

ANSWER: C

219. \_\_\_\_\_ plasmid promote conjugative transfer of plasmids.

- A. Resistant.
- B. Fertility.
- C. Male.
- D. Competent.

ANSWER: B

220. Col Plasmids code for \_\_\_\_\_ proteins which kill other bacteria.

- A. Nisin.
- B. Peadiocin.
- C. Colicins.
- D. Bacitracin.

ANSWER: C

221. The 'pBR322' vector developed by \_\_\_\_\_.

- A. Bolivar and Rodriguez
- B. Benson and Raphel.
- C. Berner and Rodriguez .
- D. Bateson and Raphel

ANSWER: A

222. PBR322 has two drug-resistance genes \_\_\_\_\_.

- A. KanR and ampR
- B. TetR and kanR.
- C. TetR and ampR.
- D. TetR and chpR.

ANSWER: C

223. The pUC plasmid contains \_\_\_\_\_ gene which allows direct visual selection of recombinants.

- A. Beta-galactosidase gene
- B. TetR and ampR.
- C. KanR and ampR
- D. TetR and kanR

ANSWER: B

224. Polylinker contains many unique restriction \_\_\_\_\_ used for the gene insertion.

- A. Target sites.
- B. Restriction site.
- C. Repeated site
- D. Reverse site.

ANSWER: A

225. A plasmid is \_\_\_\_\_.

- A. Cell
- B. Protein
- C. Lipid
- D. Extra chromosomal DNA

ANSWER: D

226. Bacteriophage vectors can take upto \_\_\_\_\_ size of gene of interest.

- A. 10 kb



- B. 20kb.
- C. 30 kb.
- D. 40kb.

ANSWER: B

227. \_\_\_\_\_ phages contain single stranded DNA molecules.

- A. M13.
- B. PBR 322.
- C. Ti plasmids.
- D. PUC.

ANSWER: A

228. Cosmid cloning vector consisting of the phage \_\_\_\_\_ site inserted into a plasmid

- A. Kan.
- B. Tet.
- C. Amp.
- D. Cos.

ANSWER: D

229. Cosmid vectors are used to clone DNA fragments up to \_\_\_\_\_ in size.

- A. 10 kb.
- B. 20kb.
- C. 30 kb.
- D. 40kb.

ANSWER: D

230. \_\_\_\_\_ site is one of the cohesive, single stranded extensions present at the ends of the DNA molecules of certain strains of lambda phage.

- A. Kan.
- B. Tet.
- C. Amp.
- D. Cos.

ANSWER: D

231. A Cloning vector based on the F Plasmid is \_\_\_\_\_.

- A. PBR322.
- B. BAC vectors
- C. PUC vectors.
- D. Lambda vectors

ANSWER: B

232. BAC is used for cloning relatively large DNA inserts up to \_\_\_\_\_ in size.

- A. 100 kb.
- B. 200 kb.
- C. 300 kb.
- D. 400 kb.

ANSWER: C

233. BAC is generally a \_\_\_\_\_ vector

- A. Expression
- B. Generalized

- C. Genetic.
- D. Regulatory.

ANSWER: A

234. \_\_\_\_\_ is a cloning vector comprising the structural components of a yeast chromosome and able to clone very large pieces of DNA.

- A. PBR322.
- B. BAC vectors.
- C. PUC vectors.
- D. YAC vectors.

ANSWER: D

235. TRP1 and URA 3 are selectable markers in \_\_\_\_\_ vector.

- A. PBR322.
- B. BAC vectors
- C. PUC vectors
- D. YAC vectors

ANSWER: D

236. Telomeres in YAC are provided by the two sequences called \_\_\_\_\_.

- A. TEL.
- B. CEN
- C. KAN.
- D. PRO.

ANSWER: A

237. YAC vectors are used to clone \_\_\_\_\_ of DNA fragments.

- A. 200 kb - 1000 kb in length.
- B. 400 kb - 1200 kb in length.
- C. 600 kb - 1400 kb in length
- D. 800 kb - 1600 kb in length

ANSWER: C

238. \_\_\_\_\_ is a circular plasmid of *Agrobacterium tumefaciens* that enables the bacterium to infect plant cells and produce a crown gall tumor.

- A. M13.
- B. PBR 322.
- C. Ti plasmids
- D. PUC.

ANSWER: C

239. Reporter gene reports on the activity of the \_\_\_\_\_ by which it is controlled.

- A. Promoter.
- B. Regulator.
- C. Controller.
- D. Operator.

ANSWER: A

240. \_\_\_\_\_ vectors can be used to perform what has been called reverse genetics.

- A. Shuttle.
- B. Expression

- C. Cassette
- D. Different.

ANSWER: A

241. The various clones representing all the genes of an organism are referred to as a \_\_\_\_\_ library of that organism library.

- A. Codon.
- B. Gene.
- C. Genome.
- D. Little.

ANSWER: B

242. DNA polymerase also has the ability to use \_\_\_\_\_ as substrates.

- A. 2', 3' - dideoxy nucleotides
- B. 3',2'- nucleotide triphosphates
- C. NTPs
- D. 5' dideoxy nucleotides

ANSWER: A

243. The most common vector for the plants are\_\_\_\_\_.

- A. SV-40 and Bovine papilloma Virus
- B. CaMV and Gemini Virus
- C. Lambda and M13 phage
- D. T4 phage

ANSWER: B

244. Vectors used for sequencing human genome was-----.

- A. BAC
- B. YAC
- C. Retroviral vectors
- D. Vaccinia Virus vectors

ANSWER: B

245. The first engineered plasmid vector is -----

- A. pBR 322
- B. pUC 18
- C. pSC 101
- D. pUC 19.

ANSWER: A

246. Restriction enzymes were discovered by

- A. Nathan, Arber and Smith in 1970
- B. Watson, Crick and Wilkins in 1970.
- C. Boyer and Cohen in 1975
- D. Paul Berg in 1975.

ANSWER: A

247. Who created the first rDNA molecule?

- A. Nathan, Arber and Smith
- B. Watson, Crick and Wilkins
- C. Boyer and Cohen

D. Paul Berg  
ANSWER: D

248. The first successful transformation of an rDNA molecule into a bacterium was carried out by \_\_\_\_\_.

- A. Nathan, Arber and Smith
- B. Watson, Crick and Wilkins
- C. Boyer and Cohen
- D. Paul Berg

ANSWER: C

249. EcoRI is an

- A. Ligase
- B. Polymerase
- C. Restriction enzyme
- D. Gyrase

ANSWER: C

250. Biological knife is \_\_\_\_\_.

- A. Exonuclease
- B. Methylase
- C. Helicase
- D. Restriction endonuclease

ANSWER: D

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