

MICROBIOLOGY

1. This combines with the 50S subunit ribosome and inhibits protein synthesis
 - (A) chloramphenicol
 - (B) tetracycline
 - (C) streptomycin
 - (D) tyrocidine
2. In northern blotting
 - (A) RNA is in the gel
 - (B) DNA is in the gel
 - (C) Antibody is in the gel
 - (D) Protein is in the gel
3. In Swiss cheese, during ripening, the characteristic eyes are due to
 - (A) lactic acid production by *L.bulgaricus*
 - (B) gas production by *Propionibacterium* species
 - (C) high temperature lactic cultures like *S. thermophilus*
 - (D) lactic fermentation using *S. cremoris*
4. The precursor from CSL which is incorporated into penicillin to give benzylpenicillin is
 - (A) phenylethylamine
 - (B) phenoxyacetic acid
 - (C) benzoic acid
 - (D) penicillanic acid
5. Plasmids are generally used as vectors, due to their
 - (A) ability to withstand high temperatures
 - (B) ability to multiply within the cell
 - (C) ability to get hydrolyzed quickly
 - (D) ability to hydrolyze RNA

6. This complexes with toxic metals and radionuclides, and thus is used as detoxifying agent.
- (A) Starch
 - (B) Acrylamide
 - (C) Alginic acid
 - (D) Gelatin
7. Limulus ameocyte lysate (LAL) bioassay is used to monitor for
- (A) steroids
 - (B) endotoxins
 - (C) exotoxins
 - (D) squalene
8. The major factor responsible in the tissue rejection process is
- (A) Polyclonal Ab produced against foreign Ag
 - (B) Monoclonal Ab produced against foreign Ag
 - (C) MHC protein present on the cells
 - (D) Cytotoxic T-cell reacting against the foreign Ag
9. The pH of a tissue culture medium was changed from 6 to 3, this change would
- (A) Precipitate the proteins in the medium
 - (B) Increase the number of hydrogen ions thousand fold
 - (C) Dissolve all the salts
 - (D) Halve the concentration of the hydroxyl ions
10. In Bt cotton, the Bt protein
- (A) Causes more cotton production
 - (B) Increases the protein content
 - (C) Stops egg laying by adult
 - (D) Prevents larvae from further feeding
11. A person without thymus will not be able to
- (A) Develop an inflammatory response
 - (B) Reject a tissue transplant
 - (C) Produce antibodies
 - (D) Fight cold and cough

12. The Monod model relates
- (A) the biomass produced to the substrate utilized
 - (B) the biomass concentration to the product concentration
 - (C) the specific growth rate to the substrate availability
 - (D) the specific growth rate to the biomass concentration
13. It's a water-in-oil emulsion with the heat killed tubercle bacteria
- (A) Freund's complete adjuvant
 - (B) Freund's incomplete adjuvant
 - (C) Complement
 - (D) None of the above
14. What is diauxie?
- (A) Nothing really. The cells just start growing
 - (B) The stage wise uptake of nutrients
 - (C) A requirement for growth factors
 - (D) Microbiological die-off
15. This is prepared by cleavage of DNA polymerase with subtilisin, giving a large enzyme fragment, which has no 5' to 3' exonuclease activity, but which still acts as a 5' to 3' polymerase.
- (A) Klenow fragment
 - (B) Okazaki fragment
 - (C) Telomerase
 - (D) Hind III
16. The analysis of a gene reveals that 30% of the nucleotides is G residues. Calculate the values for A + T.
- (A) 30%
 - (B) 40%
 - (C) 50%
 - (D) 60%
17. The enzyme used in the prevention of chill –haze in beer is
- (A) Amylase
 - (B) Lipase
 - (C) Cellulase
 - (D) Papain

18. Removal of debris and coarse materials from waste waters that may clog the equipment in the plant is known as
- (A) Preliminary treatment
 - (B) Primary treatment
 - (C) Preparatory treatment
 - (D) None of the above
19. Which of the following appears first in the circulation on stimulation?
- (A) IgM
 - (B) IgG
 - (C) IgD
 - (D) IgE
20. A protein having both structural and enzymatic properties is
- (A) Actin
 - (B) Trypsin
 - (C) Myosin
 - (D) Collagen
21. The RBC is
- (A) Rotating Biological Chain Reactor
 - (B) Rotating Biological Contactor
 - (C) Rotating Biological Centrifuge
 - (D) Round Biological Chamber
22. The single letter symbol for lysine is
- (A) L
 - (B) K
 - (C) Y
 - (D) S
23. Advantages of trickling filters is
- (A) Ponding occurs
 - (B) Bio-coenoses develop within the reactor
 - (C) Specific area of voidage is less
 - (D) The action is not filtration

24. The ratio of intensity of transmitted light to that of incident light is called
- (A) absorbance
 - (B) transmittance
 - (C) reciprocal of transmittance
 - (D) logarithm of transmittance
25. One of the following is used in waste water treatment
- (A) air lift reactors
 - (B) membrane bioreactors
 - (C) hollow fiber reactors
 - (D) continuously stirred tank reactor
26. The first discovered example of a positive regulation in bacteria was
- (A) *L-ara* operon
 - (B) *lac* operon
 - (C) *trp* operon
 - (D) *glu* operon
27. In glycerol production, the inhibitor effect is
- (A) glycerol -3-phosphate production is repressed
 - (B) conversion of glycerol -3-phosphate to glycerol is repressed
 - (C) conversion of glycerol-3-phosphate to DHAP is repressed
 - (D) acetaldehyde production is repressed
28. The repeat unit size in base pairs of the telomeres
- (A) 8 base pairs
 - (B) 6 base pairs
 - (C) 4 base pairs
 - (D) 3 base pairs
29. 1-fluoro-2, 4-dinitrobenzene is known as
- (A) Edman's reagent
 - (B) Sanger's reagent
 - (C) Folin's reagent
 - (D) Ninhydrin reagent

30. In an enzyme assay, when $[S]$ is much less than the K_m , the rate
- (A) approaches V_m
 - (B) is independent of $[S]$
 - (C) is independent of $[E]$
 - (D) is proportional to $[S]$
31. The mannitol supplied in the incubation mixture of protoplast isolation, functions primarily as
- (A) source of energy
 - (B) buffer
 - (C) osmotic stabilizer
 - (D) N-source
32. In fluidized bed reactors
- (A) Temperature gradients are very high
 - (B) Temperature is more or less uniform
 - (C) Hotspots are formed
 - (D) Segregation of solids occurs
33. An example of Gram positive plant pathogenic bacterium is
- (A) *Pseudomonas*
 - (B) *Erwinia*
 - (C) *Xanthomonas*
 - (D) *Corynebacterium*
34. The different phases of the cell cycle are in the following order
- (A) G1, S, G2, M
 - (B) S, G1, G2, M
 - (C) G2, S, M, G1
 - (D) M, G2, S, G1
35. When 20 Ci of radioactive elements were kept for 40 days, the radioactivity was reduced to 5 Ci, then the half life of the radioactive element is
- (A) 10
 - (B) 15
 - (C) 20
 - (D) 30

36. In which component of a mitochondrion, ATP is synthesized
- (A) Crista
 - (B) Matrix
 - (C) $F_0 - F_1$ complex
 - (D) Outer membrane
37. The function of penicillin in the production of glutamic acid by *Micrococcus glutaricus* is
- (A) increase glutamic acid production
 - (B) increase the purity of glutamic acid
 - (C) act as inducer
 - (D) increase cell wall permeability for glutamic acid release
38. In prokaryotes, ETC and oxidative phosphorylation occur
- (A) in the cytosol
 - (B) attached to the cell wall
 - (C) in the plasma membrane
 - (D) in vacuoles
39. The kinetics of microbial cell death is
- (A) arithmetic
 - (B) exponential
 - (C) logarithmic
 - (D) None of the above
40. In electrophoresis, if the pH is above the isoelectric pH of a protein, it will
- (A) migrate to the anode
 - (B) migrate to the cathode
 - (C) remain stationary
 - (D) precipitate
41. While constructing genomic library, one of the following combinations of restriction enzymes is most ideal. Recognize the combination
- (A) EcoR1 and Sau3A1
 - (B) EcoR1 and BamH1
 - (C) BamH1 and Sau3A1
 - (D) BamH1 and HindIII

42. Type IV hypersensitivity is caused by
- (A) IgE
 - (B) IgM
 - (C) Immune complex
 - (D) CMI
43. Oxygen demand increases when
- (A) the carbon source concentration is more reduced
 - (B) the carbon source is more reduced
 - (C) the carbon source concentration is less reduced
 - (D) carbon source is less reduced
44. The inhibition of glycolysis by oxygen is called
- (A) Hypochromic effect
 - (B) Bernoulli effect
 - (C) Pasteur effect
 - (D) Bohr effect
45. Methylated DNA has not been found in
- (A) *Drosophila*
 - (B) *E. coli*
 - (C) *Homo sapiens*
 - (D) *Arabidopsis thaliana*
46. Growth of bacteria requiring p-amino benzoic acid is inhibited by
- (A) pantothenic acid
 - (B) tetrahydrofolic acid
 - (C) folic acid
 - (D) sulfonamides
47. The chemical which induces premature polypeptide chain termination
- (A) Actinomycin
 - (B) Streptomycin
 - (C) Erythromycin
 - (D) Puromycin

48. SWL contains
- (A) 1% sugar
 - (B) 1.5% sugar
 - (C) 2% sugar
 - (D) 2.5 % sugar
49. Under aerobic conditions, cellular yield coefficient is used to estimate
- (A) Carbon requirements for biomass production
 - (B) Nitrogen requirements for biomass production
 - (C) Energy requirements for biomass production
 - (D) All the above
50. Which of the following is unchanged in the Lineweaver and Burk plot of an enzyme by the presence of an uncompetitive inhibitor?
- (A) X-intercept
 - (B) Y-intercept
 - (C) Slope
 - (D) None of the above
51. Origin of replication in *E.coli* is recognized by a complex of proteins called as
- (A) Replisome
 - (B) DNA polymerase
 - (C) Primosome
 - (D) Ribosome
52. Chitin is a polymer of
- (A) Glucosamine
 - (B) N-acetylglucosamine
 - (C) N-acetyl galactosamine
 - (D) Glucose and maltose
53. Which of the following is false about anaerobic waste water treatment processes?
- (A) Less sensitive to upsets by toxicants
 - (B) Produce less sludge than aerobic process
 - (C) Slower than aerobic process
 - (D) All the above

54. Phosphorous accumulates inside the cells as polyphosphates under
- (A) Microaerophilic conditions
 - (B) Anaerobic conditions
 - (C) Aerobic conditions
 - (D) Conditions of nutrient depletion
55. Eukaryotic cells containDNA polymerases.
- (A) 3
 - (B) 4
 - (C) 5
 - (D) 6
56. Beet molasses
- (A) is limiting in biotin for yeast production
 - (B) is 70-75% sugar
 - (C) best molasses ever
 - (D) is hydrol
57. The addition of antifoams in an aerated bioreactor will decrease oxygen transfer rates because antifoams
- (A) decrease bubble coalescence
 - (B) reduce surface tension of the liquid
 - (C) decrease bubble size
 - (D) increase substrate availability
58. In fermentor sterilization, the thermal death characteristics of which organism is used?
- (A) *Bacillus megaterium*
 - (B) *Bacillus macerans*
 - (C) *Bacillus stearothermophilus*
 - (D) *Coxiella burnetti*
59. When *Saccharomyces cerevisiae* is grown in a medium with a high concentration of glucose, the cells will
- (A) ferment only if the dissolved oxygen concentration is high
 - (B) ferment only if the dissolved oxygen concentration is low
 - (C) ferment regardless of the concentration of dissolved oxygen
 - (D) None of the above

60. Which of the following is best described as a secondary metabolite?
- (A) Penicillin
 - (B) Glutamic acid
 - (C) Acetic acid from oxidation of alcohol
 - (D) Ethanol from fermentation of glucose
61. The region of the air lift reactor in which the air is sparged is called
- (A) the down comer
 - (B) the air riser
 - (C) the disengagement zone
 - (D) flotsam
62. Antibiotic that damages the cytoplasmic membrane
- (A) Chloramphenicol
 - (B) Polymyxin
 - (C) Penicillin
 - (D) Cycloserine
63. Identify the variety of surface ripened cheese
- (A) Monterey
 - (B) Limburger
 - (C) Gouda
 - (D) Edam
64. The Orleans process is used in the manufacture of
- (A) Interferon
 - (B) Dextran
 - (C) Vinegar
 - (D) 2,3-butanediol
65. Picornaviridae are
- (A) Viruses composed of single stranded (+) type RNA
 - (B) Viruses composed of single stranded (-) type RNA
 - (C) Viruses composed of single stranded DNA
 - (D) Viruses composed of double stranded RNA

66. Negri bodies, inclusion bodies in Purkinje cells and cells of the hippocampus are diagnostic of
- (A) Vesicular stomatitis
 - (B) Mumps
 - (C) Rabies
 - (D) Influenza
67. Mammals cannot synthesize
- (A) linoleate and linolenate
 - (B) palmitic acid and linoleic acid
 - (C) oleic acid and linoleic acid
 - (D) palmitic acid and oleic acid
68. The outer membrane of the Gram negative cell wall is anchored to the underlying peptidoglycan by means of
- (A) Pseudomurein
 - (B) Braun's lipoprotein
 - (C) Teichoic acids
 - (D) Core polysaccharide
69. The resolving power of the unaided human eye is
- (A) 10 micrometre
 - (B) 100 micrometre
 - (C) 1000 nanometre
 - (D) 1000 nanometre
70. MacConkey agar is modified according to need. Choose the correct answer from the following
- (i) If swarming of *Proteus* species is *not* required, sodium chloride is omitted.
 - (ii) Crystal violet at 0.0001% is included to inhibit Gram-positive bacteria.
 - (iii) MacConkey with sorbitol is used to isolate an enteric pathogen *E. coli* O157.
- (A) (i), (ii) and (iii) are incorrect
 - (B) (i), (ii) are correct, but (iii) is incorrect
 - (C) (i), (ii) and (iii) are all correct
 - (D) (i) and (iii) are incorrect, but (ii) is correct

71. When tryptophan is converted by tryptophanase, roseindol is formed by adding Kovac's reagent containing
- (A) p-dimethylaminobenzaldehyde
 - (B) p-aminobenzoic acid and aldehyde
 - (C) tetramethylparaphenylene diamine dihydrochloride
 - (D) p-dimethylaminocinnamaldehyde
72. Identify this medium based on the composition- yeast extract, peptone, sodium thiosulfate, sodium citrate, ox, gall, sodium cholate, saccharose, sodium chloride, ferric citrate, bromothymol blue, thymol blue and agar.
- (A) Simmon's citrate agar
 - (B) TCBS agar
 - (C) EMB agar
 - (D) XLD agar
73. Select the correct choice for the statement-*The redox indicator used in oxidase test*
- (i) *hydrochloride salt of N,N,N',N'-tetramethyl-p-phenylenediamine*
 - (ii) *hydrochloride salt of p-dimethyaminocinnamaldehyde*
 - (iii) Wurster's blue is the trivial name and the radical cation is a characteristic blue-violet colour
 - (iv) It loses two electrons in one-electron oxidation steps
- (A) (i) is correct, (ii), (iii) and (iv) are incorrect
 - (B) (i), (iii) and (iv) are correct, while (ii) is incorrect
 - (C) (i) and (ii) are correct, (iii) and (iv) are incorrect
 - (D) (ii), (iii) and (iv) are correct, while (i) is incorrect
74. The Crystal® VC Rapid Diagnostic Test (RDT) Procedure is used for
- (A) *E.coli*
 - (B) *V.parahaemolyticus*
 - (C) *P.aeruginosa*
 - (D) *V.cholerae*
75. Peroxisomes and glyoxysomes are
- (A) energy transforming organelles
 - (B) membraneless organelles
 - (C) macrobodies
 - (D) microbodies

76. Indole acetic acid belongs to a group of hormones known as
- (A) Cytokinins
 - (B) Gibberellins
 - (C) Auxins
 - (D) Abscissic acid
77. The flattened, bulb like structure, produced by the fungi, which allows them to penetrate their host plants directly is known as
- (A) appressorium
 - (B) propagule
 - (C) biotroph
 - (D) aecium
78. The openings on fruits, stems and tubers that are filled with loosely connected cells to allow passage of air are known as
- (A) Hydathodes
 - (B) Lenticels
 - (C) Porins
 - (D) Stomata
79. Cutin is an insoluble polyester of
- (A) C_{12} and C_{20} hydroxy fatty acids
 - (B) C_{20} hydroxy fatty acids
 - (C) C_{12} hydroxy fatty acids
 - (D) C_{16} and C_{18} hydroxy fatty acids
80. The wild fire disease of tobacco is caused by
- (A) *Pseudomonas syringae*
 - (B) *Pseudomonas aeruginosa*
 - (C) *Pseudomonas putida*
 - (D) *Pseudomonas solanacearum*
81. The disease caused by the bacterium *Agrobacterium tumefaciens* is
- (A) Corn smut
 - (B) Crown gall
 - (C) Banana wilt
 - (D) Root knot

82. When plants are infected with pathogens,
- (A) The rate of respiration generally increases
 - (B) The rate of respiration generally decreases
 - (C) Transpiration is usually decreased
 - (D) Photosynthesis usually increases
83. The causative agent of smuts that cause the ears and grains to be transformed into greenish black mass or soot is
- (A) *Puccinia*
 - (B) *Phytophthora*
 - (C) *Ustilago*
 - (D) *Fusarium*
84. The saponins present in oats and which have antifungal membranolytic activity is
- (A) Tomatine
 - (B) Avenacin
 - (C) Zeatin
 - (D) Lectin
85. The precursor of the wound hormone traumatin, that also acts as a signal transducer of the defense reaction in plant-pathogen interactions is
- (A) Jasmonic acid
 - (B) Gibberellic acid
 - (C) Indol acetic acid
 - (D) Glutamic acid
86. Phytoalexins
- (A) Are produced during compatible biotrophic infections
 - (B) Are produced by healthy cells adjacent to the localized damaged and necrotic cells in response to materials diffusing from the damaged cells
 - (C) Do not accumulate around both resistant and susceptible necrotic tissues
 - (D) Are not produced after stimulation by phytopathogenic microorganisms or by chemical and mechanical injury
87. During drought conditions, plants produce a hormone known as
- (A) Indole acetic acid
 - (B) Ethylene
 - (C) Abscissic acid
 - (D) Indole butyric acid

88. Cybrid cells
- (A) contain the nucleus of one cell and the cytoplasm of the other cell
 - (B) contain the nuclei and the cytoplasm of both protoplast cells
 - (C) contain only the nuclei of both protoplast cells
 - (D) contain only the cytoplasm of both protoplast cells
89. Cauliflower mosaic virus is a
- (A) ds DNA virus
 - (B) ss DNA virus
 - (C) ss RNA virus
 - (D) ds RNA virus
90. Bordeaux mixture used against downy mildew is a product of the reaction of
- (A) Copper sulfate and calcium hydroxide
 - (B) Sodium sulfate and calcium hydroxide
 - (C) Calcium sulfate and calcium hydroxide
 - (D) Zinc sulfate and calcium hydroxide
91. The pH of normal unpolluted rain is usually
- (A) pH 7.0
 - (B) pH 6.0
 - (C) pH 5.6
 - (D) pH 4.5
92. Protoplasts are used for genetic engineering because
- (A) they have diploid nucleus
 - (B) they have no cell wall
 - (C) they have no cell membrane
 - (D) they have intact cytoplasm
93. Ectomycorrhizae is an association of
- (A) bacteria and plant
 - (B) cyanobacteria and fungi
 - (C) bacteria and fungi
 - (D) fungi and plant root

94. When sterilizing at 15 lbs pressure for 20 minutes, the temperature is
- (A) 110°C
 - (B) 115°C
 - (C) 121°C
 - (D) 125°C
95. The fungus-like members of the kingdom Chromista that have elongated mycelium containing cellulose but no cross walls are
- (A) Myxomycetes
 - (B) Oomycetes
 - (C) Zygomycetes
 - (D) Plasmodiophoromycetes
96. *Xanthomonas campestris* is a seed pathogen that causes
- (A) black rot of Cauliflower
 - (B) root rot of Barley
 - (C) anthracnose of French beans
 - (D) leaf blight of Carrot
97. Koch's postulates-Which of the statements below is false?
- (A) The microorganisms must not necessarily be found isolated with every instance of disease
 - (B) The microorganism must be isolated and brought into pure culture and its specific characters studied
 - (C) When the host is inoculated with the isolated microorganism under optimum conditions, the disease should appear with characteristic symptoms
 - (D) The microorganism be reisolated and on comparison with the original culture, must be found identical
98. A group of plant proteins that bind to specific carbohydrates
- (A) Pectins
 - (B) Lectins
 - (C) Chitins
 - (D) Cutins
99. Haustoria are present in plants like
- (A) Vanda
 - (B) Rhizophora
 - (C) Tinospora
 - (D) Mistletoe

100. Keefe's solution
- (A) is a medium for the preservation of green color in plant specimen
 - (B) is a nuclear stain
 - (C) is a fixative
 - (D) is a culture medium for bacteria
101. Loeffler's alkaline methylene blue is
- (A) Flagella stain
 - (B) Spore stain
 - (C) Acid fast stain
 - (D) Capsule stain
102. Process absent in virus or not virus mediated
- (A) Replication
 - (B) Mutation
 - (C) protein synthesis
 - (D) energy liberation
103. Mycoplasma like organisms which have only cell membrane and lacking cell wall are classified as
- (A) Gracilicutes
 - (B) Firmicutes
 - (C) Mollicutes
 - (D) Proteobacteria
104. The change of a cell through uptake and expression of additional genetic material
- (A) Conjugation
 - (B) Transformation
 - (C) Generalized transduction
 - (D) Specialized transduction
105. RNA dependent DNA polymerase is part of genome of
- (A) Influenza virus
 - (B) Herpes virus
 - (C) Adenovirus
 - (D) Papilloma virus

106. Incorporation of 5-bromouracil into DNA will result in conversion of
- (A) AT to GC
 - (B) GC to AT
 - (C) TA to AT
 - (D) CG to GC
107. The function of the sex (F) pilus of *Escherichia coli* involves
- (A) transport of nutrients
 - (B) attachment of cells to inert surfaces
 - (C) movement of cells in a type of twitching motion
 - (D) transfer of DNA between bacteria during conjugation
108. In bacterial genetics, the term competence refers to a bacterium with
- (A) ability to be transformed
 - (B) the F factor integrated into its chromosomal DNA
 - (C) susceptibility to lytic infection by bacteriophage
 - (D) ability to act as a DNA donor during transformation
109. Which of the following is an advantage that ectotherms have over endotherms of the same size?
- (A) They require much less food
 - (B) They are less vulnerable to predation during cold weather
 - (C) They can remain active in cold weather or on cold nights
 - (D) They have higher metabolic rates and grow more quickly
110. As an animal gets larger, which of the following occurs?
- (A) Its surface area grows more rapidly than its volume
 - (B) Its volume grows more rapidly than its surface area
 - (C) Its volume and surface area increase in perfect proportion to each other
 - (D) Its volume increases, but its total surface area decreases
111. Cellulose is fermented in which of the following structures in rabbits?
- (A) Small intestine
 - (B) Caecum
 - (C) Rectum
 - (D) Rumen

112. Which of the following brain regions is responsible for formation of new memories?
- (A) Brain stem
 - (B) Cerebellum
 - (C) Frontal lobe
 - (D) Hippocampus
113. Which of the following classes of muscles is/are voluntary?
- (A) Skeletal muscle
 - (B) Cardiac muscle
 - (C) Smooth muscle
 - (D) All of the above
114. Which of the following developmental processes is not controlled by hormones?
- (A) The initial development of male and female gonads in mammals, soon after fertilization
 - (B) Overall growth in vertebrates
 - (C) Moulting in insects and other invertebrates
 - (D) Metamorphosis in insects and other invertebrates
115. Which of the following modes of asexual reproduction describes the mode of reproduction in Sea anemones?
- (A) Fusion
 - (B) Fission
 - (C) Budding
 - (D) Parthenogenesis
116. What happens during cleavage?
- (A) The neural tube forms
 - (B) The inner cell mass of the blastocyst begins dividing rapidly
 - (C) The zygote divides rapidly without growth, forming a mass of cells
 - (D) Massive movements of cells form the three germ layers
117. What is the most important difference between the innate and adaptive immune responses?
- (A) The innate response does not distinguish between pathogens, while the adaptive response does
 - (B) Only the innate response is activated by antigens
 - (C) The adaptive response generates immunological memory and is more specific than the innate response
 - (D) The innate response does not kill cells; the adaptive response does

118. What is one of the differences between CD4⁺ and CD8⁺ cells?
- (A) CD4⁺ cells are immature, and CD8⁺ cells are mature
 - (B) CD4⁺ cells are activated, and CD8⁺ cells are not
 - (C) CD4⁺ cells activate cell-mediated responses, and CD8⁺ cells activate humoral responses
 - (D) CD4⁺ cells interact with Class II MHC proteins and CD8⁺ cells interact with class I MHC proteins
119. Which of the following is not found in the cells of higher plants?
- (A) Plasma membrane
 - (B) Chromoplasts
 - (C) Ribosomes
 - (D) Centriole
120. A behaviour is considered adaptive if it increases an individual's fitness. How is fitness measured?
- (A) Strength
 - (B) Speed
 - (C) Body size
 - (D) Number of viable offspring
121. A taxon is
- (A) A group of related plants or animals
 - (B) A type of living organism
 - (C) A group of related families
 - (D) A taxonomic group of any rank
122. The pesticide DDT will be mostly concentrated in
- (A) Tertiary consumers
 - (B) Primary decomposers
 - (C) Primary producers
 - (D) Secondary consumers
123. What does genetic diversity mean?
- (A) The count of species in a territory
 - (B) Species interacting with the abiotic environment
 - (C) Abundance of each species present
 - (D) The complete genetic information of a population, species or a group of species

124. Blue-green algae belong to the kingdom
- (A) Monera
 - (B) Protista
 - (C) Fungi
 - (D) Plantae
125. The group of vertebrates with the greatest capacity for gas exchange across the skin is
- (A) Fishes
 - (B) Amphibians
 - (C) Reptiles
 - (D) Mammals
126. Which of Mendel's laws cannot be observed in a single-factor cross?
- (A) Segregation
 - (B) Dominance
 - (C) Independent assortment
 - (D) Recessiveness
127. The enzyme that allows short segments of DNA to move from one location in the genome to another is
- (A) Transposase
 - (B) Restriction endonuclease
 - (C) DNA polymerase
 - (D) RNA polymerase
128. The movement of landmasses that have changed their positions, shapes, and association with other landmasses is called
- (A) Glaciation
 - (B) Pangaea
 - (C) Continental drift
 - (D) Biogeography
129. Neck is absent in frog. This helps frog in
- (A) Jumping around
 - (B) Swimming in water
 - (C) Respiration
 - (D) Catching prey

130. In frog, the biggest bone of vertebral column is
- (A) Pygostyle
 - (B) Urostyle
 - (C) Urostyle
 - (D) None of the above
131. Hepatic portal system starts from
- (A) Digestive system to liver
 - (B) Kidney to liver
 - (C) Liver to heart
 - (D) Liver to kidney
132. Nissl granules are found in
- (A) Internal ear
 - (B) Uriniferous tubules
 - (C) Bile juice
 - (D) Neuronal cell
133. Which of the following chromosomes are found in salivary glands of *Drosophila*?
- (A) Normal
 - (B) Lampbrush
 - (C) Polytene
 - (D) Heterochromatic
134. In ecological sense, the desert animals are termed as
- (A) Arboreal
 - (B) Cursorial
 - (C) Benthic
 - (D) Xeric
135. Animal species should be preserved mainly because
- (A) They are lovely creatures
 - (B) They are useful to mankind
 - (C) Man cannot recreate a species of animals if it be destroyed
 - (D) Zoologists want to study them

136. Memory cells are produced by
- (A) Only B-cells
 - (B) Only T-cells
 - (C) Mainly T-cells
 - (D) Both B - and T- cells
137. Helper T-cells
- (A) Produce antibodies
 - (B) Stimulate antibody production by B-cells
 - (C) Produce B-cells
 - (D) Produce B-cells as well as Killer cells
138. Heterocysts are specialized for
- (A) Aerobic respiration
 - (B) Photosynthesis
 - (C) Nitrogen fixation
 - (D) Reproduction
139. Coprophilous fungi grow on
- (A) Grasses
 - (B) Dung
 - (C) Animals
 - (D) Wood
140. Sorosis is the fruit that develops from an inflorescence like:
- (A) Spike or Spadix
 - (B) Capitulum
 - (C) Racemose
 - (D) Cymose
141. Female sex organ of Rhodophyceae is
- (A) Carpogonium
 - (B) Archegonium
 - (C) Oogonium
 - (D) Sporogonium

142. In Pteridophytes, reduction division occurs when
- (A) Prothallus is formed
 - (B) Sex organs are formed
 - (C) Spores are formed
 - (D) Gametes are formed
143. Lichens are ecologically important because
- (A) They are associations of algae and fungi
 - (B) They can grow in highly polluted areas
 - (C) They are pioneers of vegetation in a lithosphere
 - (D) They are symbiotic with higher plants
144. The catalytic efficiency of two different enzymes can be compared by the
- (A) formation of the product
 - (B) the pH of optimum value
 - (C) the K_m value
 - (D) molecular size of the enzyme
145. When synapsis is complete all along the chromosome, the cell is said to have entered a stage called
- (A) Zygotene
 - (B) Pachytene
 - (C) Diplotene
 - (D) Diakinesis
146. The pathway of the movement of water through cell wall only is called
- (A) Symplast pathway
 - (B) Plasmodesmata pathway
 - (C) Apoplast pathway
 - (D) Vacuolar pathway
147. *Hevea brasiliensis* belongs to the family:
- (A) Fabaceae
 - (B) Lamiaceae
 - (C) Verbinaceae
 - (D) Euphorbiaceae

148. A mutually beneficial association which is necessary for the survival of both the partners is called:
- (A) Symbiosis
 - (B) Commensalism
 - (C) Parasitism
 - (D) Mutualism
149. The correct sequence of flow of electrons in the light reaction is
- (A) PS II, plastoquinone, cytochromes, PS I, ferredoxin
 - (B) PS I, plastoquinone, cytochrome, PS II, ferredoxin
 - (C) PS I, ferredoxin, PS II
 - (D) PS I, plastoquinone, cytochromes, PS II, ferredoxin
150. The chemiosmotic hypothesis of oxidative phosphorylation process is that ATP is formed because
- (A) A proton gradient forms across the inner mitochondrial membrane
 - (B) There is a change in the permeability of the inner mitochondrial membrane towards ADP
 - (C) High energy bonds are formed in mitochondrial proteins
 - (D) ADP is pumped out of the matrix into the inner membrane space

ANSWER KEY**Subject Name: 623 MICROBIOLOGY**

SI No.	Key	SI No.	Key	SI No.	Key	SI No.	Key	SI No.	Key
1	A	31	C	61	C	91	C	121	A
2	A	32	B	62	B	92	B	122	A
3	B	33	D	63	B	93	D	123	C
4	A	34	A	64	C	94	C	124	A
5	B	35	C	65	A	95	B	125	B
6	C	36	C	66	C	96	A	126	C
7	B	37	D	67	A	97	A	127	A
8	C	38	C	68	B	98	B	128	C
9	B	39	B	69	B	99	D	129	B
10	D	40	A	70	C	100	A	130	C
11	B	41	C	71	A	101	C	131	A
12	C	42	D	72	B	102	D	132	D
13	A	43	B	73	B	103	C	133	C
14	B	44	C	74	D	104	B	134	D
15	A	45	D	75	D	105	A	135	C
16	B	46	D	76	C	106	A	136	D
17	D	47	D	77	A	107	D	137	B
18	A	48	C	78	B	108	A	138	C
19	A	49	A	79	D	109	A	139	B
20	C	50	C	80	A	110	B	140	A
21	B	51	C	81	B	111	B	141	A
22	B	52	B	82	A	112	D	142	C
23	B	53	A	83	C	113	A	143	C
24	B	54	C	84	B	114	A	144	C
25	D	55	C	85	A	115	B	145	B
26	A	56	A	86	B	116	C	146	C
27	D	57	B	87	C	117	C	147	D
28	B	58	C	88	A	118	D	148	D
29	B	59	B	89	A	119	D	149	A
30	D	60	A	90	A	120	D	150	A