

1. The following test is used to differentiate *Streptococcus* from *Staphylococcus*:
 - A. Coagulase test
 - B. Catalase test
 - C. Phosphatase
 - D. Indole test
2. Jumping gene is known as:
 - A. Transposon
 - B. Episome
 - C. Cosmid
 - D. Plasmid
3. *Staphylococcus* bacteria secrete all, EXCEPT:
 - A. Lipase
 - B. Cellulase
 - C. Coagulase
 - D. Lecithinase
4. Quellung reaction is due to _____ swelling.
 - A. Capsular
 - B. Flagellar
 - C. RBC
 - D. Ribosomal
5. Gram negative cocci is:
 - A. *Staphylococcus*
 - B. *Streptococcus*
 - C. *Neisseria*
 - D. *Salmonella*
6. Medusa head colony is found in:
 - A. *Clostridium*
 - B. *Bacillus*
 - C. *Pseudomonas*
 - D. *E. coli*
7. All of the following are acid fast bacteria EXCEPT:
 - A. *Cryptosporidium*
 - B. *Mycoplasma*
 - C. *Mycobacterium*
 - D. *Nocardia*
8. Widal test is an example of:
 - A. Flocculation
 - B. Precipitation
 - C. Agglutination
 - D. Both "A" and "B"
9. Genome of Herpes Simplex Virus comprises of:
 - A. ssDNA
 - B. dsDNA
 - C. ssRNA
 - D. dsRNA
10. All of the following methods are used for serological diagnosis, EXCEPT:
 - A. CFT
 - B. PCR
 - C. SRH
 - D. Western blot
11. Which of the following virus is not associated with respiratory infections?
 - A. Rotavirus
 - B. *Adenovirus*
 - C. Influenza virus
 - D. RSV
12. HCV belongs to genus:
 - A. *Togavirus*
 - B. *Flavivirus*
 - C. *Filovirus*
 - D. *Retrovirus*
13. Aflatoxin is produced by:
 - A. *Candida*
 - B. *Penicillium*
 - C. *Aspergillus flavus*
 - D. *Clostridium*
14. HIV infects most commonly:
 - A. CD4+ cells
 - B. CD8+ cells
 - C. B-lymphocytes
 - D. Basophils
15. Which one is an essential part of life cycle of *Toxoplasma gondii* is spread by:
 - A. Dog
 - B. Cat
 - C. Human
 - D. Sheep
16. Cell mediated immunity is mainly carried out by:
 - A. T cells
 - B. B cells
 - C. Macrophages
 - D. Monocytes
17. Vaccination is based on the principle of:
 - A. Agglutination
 - B. Phagocytosis
 - C. Immunological memory
 - D. Clonal deletion
18. Reaction of soluble antigen with antibody is _____.
 - A. Agglutination
 - B. Precipitation
 - C. Flocculation
 - D. CFT
19. Preliminary screening can be done by:
 - A. restriction enzyme
 - B. dyes
 - C. antibiotics
 - D. radiation
20. All of these are antigen presenting cells EXCEPT:
 - A. T cells
 - B. B cells
 - C. Dendritic cells
 - D. Langerhans cells
21. Which of the following is not included in intrinsic determinants of a disease?
 - A. Specie
 - B. Environment
 - C. Genetics
 - D. Both "A" and "B"
22. Which of the following substance can only induce immune response after binding to a larger molecule?
 - A. Antigen
 - B. Virus
 - C. Hapten
 - D. Antibody

23. To identify participants based on their disease / outcome status, compare presence of risk factor:
- Case-control
 - Experimental
 - Cross-sectional
 - None of these
24. ___ is an example of arthropod vector borne disease?
- Avian influenza
 - Tuberculosis
 - Spirochetosis
 - CRD
25. Latent infection is seen in viral infections EXCEPT:
- HIV
 - EBV
 - Rotavirus
 - Cytomegalovirus (CMV)
26. Endotoxin for Gram-negative organism is:
- Polysaccharide
 - Glycoprotein
 - Lipoprotein
 - Lipopolysaccharide
27. Which of the following is not an oncogenic virus?
- HTLV-1
 - Adenovirus
 - Papilloma virus
 - HBV
28. Which of the following is obligate anaerobe?
- Clostridium
 - Bacillus*
 - Staphylococcus*
 - Klebsiella*
29. _____ refers only to the number of new cases of a disease occurring in a given period.
- % positivity
 - Prevalence
 - Hyperendemic
 - Incidence
30. Fungi that possess a capsule is:
- Candida*
 - Aspergillus*
 - Cryptococcus*
 - Mucor*
31. The dose required to kill 50% of the lab animals tested under standard called _____.
- ID₅₀
 - MLD₅₀
 - TCIC₅₀
 - LD₅₀
32. All are used in Gram's staining, EXCEPT:
- Methylene blue
 - Iodine
 - Safranin
 - Crystal violet
33. Viruses do not contain:
- DNA
 - RNA
 - Enzyme
 - Cell wall
34. _____ is chain forming, & round shaped bacteria.
- Pneumococcus*
 - Streptococcus*
 - Staphylococcus*
 - Diplococcus*
35. All the following can be zoonotic EXCEPT:
- Influenza A H5N1
 - Hantaviruses
 - Poliomyelitis
 - Rabies
36. Presence of maternal Abs _____ the effect of vaccine.
- Antagonize
 - Enhance
 - Synergize
 - Complement
37. A diagnostic test lacking in _____ results in false positive results.
- Specificity
 - Predictive value
 - Sensitivity
 - Reproducibility
38. Which one of the following is NOT included in innate immune response?
- phagocytosis
 - complement activation
 - antibodies production
 - NK cells activation
39. Viruses are:
- Obligate intracellular parasites
 - Have their own metabolism
 - Divide by binary fission
 - Have both DNA and RNA
40. The vector of plague is:
- Flies
 - Mosquitoes
 - Ticks
 - Fleas
41. Positive tuberculin test is an example of:
- hypersensitivity type-I
 - hypersensitivity type-II
 - hypersensitivity type-III
 - hypersensitivity type-IV
42. Process of binding primer to DNA template is called:
- Denaturation
 - Annealing
 - Extension
 - Bounding
43. _____ reagent is used to precipitate DNA.
- Isopropanol
 - SDS
 - Phenol
 - Chloroform
44. _____ enzyme is used to synthesize DNA using an mRNA template.
- Taq polymerase
 - Alkaline Phosphatase
 - Reverse transcriptase
 - Nuclease

45. Making routine observations on health, productivity & environment is called as:
- GIS
 - Monitoring
 - Surveillance
 - Cohort studies
46. _____ disease is transmitted from parrot to human.
- Typhoid
 - Bird flu
 - Psittacosis
 - Cholera
47. The ability of the immune system to recognize self-antigens versus non-self-antigen is an example of:
- Specific immunity
 - Humoral immunity
 - Cell mediated immunity
 - Tolerance
48. The coagulase test is used to differentiate between *Staphylococcus aureus* from:
- Streptococci*
 - Micrococci*
 - Enterococci*
 - other staphylococci
49. All are antigen-antibody interaction in living host EXCEPT:
- Neutralization
 - Precipitation
 - Opsonization
 - Agglutination
50. Which of the following is a type of leukocytes and are included in agranulocytes?
- Neutrophils
 - Basophils
 - Monocytes
 - Eosinophils
51. Which one is NOT protective mechanism of body:
- Fever
 - Necrosis
 - Phagocytosis
 - Inflammation
52. Bioterrorism microbial agents are classified based upon:
- Pathogenicity
 - Spread
 - Availability
 - Both "A" and "B"
53. Which one of the following immunoglobulins can cross the blood placental barrier?
- Ig G
 - Ig M
 - Ig A
 - Ig D
54. Hematopoietic stem cells are precursor cells for all of the following EXCEPT:
- Lymphocytes
 - Monocytes
 - Erythrocytes
 - Vascular smooth muscle cells
55. Macrophages present in liver are called:
- microglial cells
 - alveolar macrophages
 - Kupffer cells
 - wondering macrophages
56. Antibiotic penicillin was introduced by:
- Pasteur
 - Fleming
 - Jenner
 - Lister
57. Prokaryotic cell lacks:
- DNA
 - Ribosomes
 - Mitochondria
 - Plasma membrane
58. Immunity against yellow fever in newborn is an example of:
- Active naturally acquired
 - passive artificially acquired
 - passive naturally acquired
 - artificial immunity
59. All structures are external to cell wall EXCEPT:
- Glycocalyx
 - Flagella
 - Pilli
 - Spores
60. A typical bacterial cell has only _____ volume of a typical eukaryotic cell.
- 1/10
 - 1/100
 - 1/1000
 - 1/10000
61. PCR reaction includes all, EXCEPT:
- DNA ligase
 - four DNTPs
 - DNA template
 - DNA polymerase
62. If disease is endemic, prevalence equals to:
- $C \times I$
 - $I \times D$
 - $P \times D$
 - $C \times D$
63. Southern hybridization is used to identify:
- A specific protein
 - A specific RNA seq
 - A specific DNA sequence
 - Both "A" and "B"
64. All of the following bacteria are members of family *Enterobacteriaceae* EXCEPT:
- E. coli*
 - Shigella*
 - Staphylococcus*
 - Salmonella*
65. A library of DNA fragments results from the use of:
- Viruses
 - Restriction endonucleases
 - DNA ligases
 - Plasmids

66. Swarming growth is the characteristic of Gram-negative bacteria known as:
- Clostridium*
 - Proteus*
 - Pasteurella*
 - Pseudomonas*
67. Mesophilic bacteria CANNOT grow at temperature:
- 16°C
 - 25°C
 - 35°C
 - 38°C
68. Facultative anaerobic bacteria grow in presence of:
- only O₂
 - O₂ and also CO₂
 - only CO₂
 - N₂
69. Mannitol salt agar is an example of:
- Selective medium
 - Differential medium
 - Both "A" and "B"
 - Enrichment medium
70. Translation occurs in:
- Nucleus
 - Cytoplasm
 - Ribosomes
 - Both "A" and "B"
71. An intron is found in:
- DNA
 - RNA
 - mRNA
 - tRNA
72. Signal responsible for the end of transcription is:
- Stop codon
 - RNA polymerase run out
 - End of DNA chain
 - Terminator
73. Plasmids are inserted in bacterial cell from environment:
- Transformation
 - DNA ligase
 - Transfection
 - Transduction
74. Which of following could NOT be a portal of entry?
- Meninges
 - Skin
 - Placenta
 - Small intestine
75. Highly communicable pathogen, especially via direct contact is known as:
- Zoonotic
 - Contagious
 - Nosocomial
 - Communicable
76. Motility of the bacteria can be observed by:
- Hanging drop method
 - Soft agar method
 - Both "A" and "B"
 - Pour plate method
77. O157:H7 is pathogenic type of:
- Salmonella typhi*
 - E. coli*
 - S. aureus*
 - Streptococcus*
78. All of the following bacteria are non-spore forming bacteria EXCEPT:
- E. coli*
 - Clostridium*
 - Streptococcus*
 - Leptospira*
79. The ability of Microscope to distinguish two objects into two separate objects, is called:
- Magnification power
 - Wavelength
 - Resolving power
 - None of these
80. A sudden outbreak of disease in which number of cases increase beyond expected trends is known as:
- Endemic
 - Epidemic
 - Sporadic
 - Pandemic
81. Serum is collected from _____ blood.
- Heparinized
 - Unclotted
 - Clotted
 - All of these
82. Amboceptors are Abs raised against RBCs of:
- Sheep
 - Cow
 - Goat
 - Horse
83. GET buffer in plasmid isolation of bacteria contains:
- Glucose
 - EDTA
 - Tris
 - All of these
84. Majority of the antigens are:
- Protein
 - Nucleic acid
 - Lipids
 - Carbohydrates
85. RNAi' stands for which of the following:
- RNA inducer
 - RNA insertion
 - RNA interference
 - RNA intron
86. The botulism intoxication occurs due to:
- An enterotoxin
 - A neurotoxin
 - A mycotoxin
 - All of these
87. An animal that only acts as short-term transmitter:
- Passive carrier
 - Mechanical carrier
 - Biological carrier
 - Asymptomatic carrier

88. Adenine and guanine are example of which class of nitrogen base:
- Large
 - Pyrimidines
 - Small
 - Purines
89. Which of the following is not a function of capsule?
- Attachment
 - Motility
 - Biofilm
 - Used as nutrition
90. Whiff test is used for the diagnosis of:
- Entamoeba*
 - Giardia*
 - E. coli*
 - Trichomonas*
91. _____ is Gram positive rod & spore forming bacteria.
- Pseudomonas*
 - Staphylococcus*
 - Salmonella*
 - Bacillus*
92. Which of the following vaccine is recommended for pregnant women?
- Tetanus
 - Tuberculosis
 - AIDS
 - Poliomyelitis
93. Natural competence was first time described in:
- E. coli*
 - Streptococcus*
 - Staphylococcus*
 - Bacillus*
94. In genomic DNA isolation, TE buffer functions as:
- Block endonucleases
 - Maintain pH
 - Denature protein
 - Both "A" and "B"
95. An example of non-communicable disease is:
- Measles
 - Tuberculosis
 - Leprosy
 - Tetanus
96. *E. coli* O157:H7 produces _____.
- Colon toxin
 - Neurotoxin
 - Exotoxin
 - Shiga toxin
97. Treatment with which salt gives properties of competency to bacterial cells?
- NaCl
 - HgCl
 - NaHCO₃
 - CaCl₂
98. Lyophilization means:
- Sterilization
 - Burning to ashes
 - Exposure to formation
 - Freeze-drying
99. _____ is NOT an example of inflammation?
- Pain
 - Sweating
 - Heat
 - Swelling
100. Typhoid is usually diagnosed by:
- Typhidot test
 - Widal test
 - Precipitation test
 - Typhidot and widal tests
101. *Clostridium bacillus* is:
- Facultative anaerobe
 - Facultative aerobe
 - Obligate anaerobe
 - Obligate aerobe
102. α -hemolytic streptococci are also known as _____.
- Streptococcus pyogenes*
 - Virulence group
 - Viridans group
 - CoNS
103. _____ is/are used to determine glucose fermentation by bacteria?
- Methyl red test
 - TSI test
 - Urease test
 - MR test and TSI test
104. Protein particles which can cause disease are:
- Virions
 - Nucleoida
 - Bacteriophages
 - Prions
105. Bacteria are more sensitive to antibiotics at which phase of growth curve?
- Decline phase
 - Lag phase
 - Log phase
 - Stationary phase
106. Syphilis is a bacterial STD, caused by _____.
- Trichomonas vaginalis*
 - Treponema pallidum*
 - Leptospira*
 - Neisseria gonorrhoea*
107. Staining material of Gram-negative bacteria is
- Crystal violet
 - Safranin
 - Carbol fuchsin
 - Methylene blue
108. The bacterium that is most commonly used in genetic engineering is:
- Staphylococcus*
 - Klebsiella*
 - Proteus*
 - Escherichia*
109. In autoclave, the principle involved is:
- Dry heat
 - Moist heat
 - Steam under pressure
 - Moist heat and steam under pressure

110. ____ is NOT an example of immuno-diagnostic test.
- PCR
 - Serum plate agglutination test
 - ELISA
 - FAT
111. Staph-110 used for the isolation of *Staphylococcus*, is an example of _____ medium.
- Selective
 - Enrichment
 - Differential
 - General purpose
112. Production of RNA from DNA is called:
- Translation
 - Transcription
 - RNA splicing
 - Replication
113. Metachromatic granules are found in:
- Mycoplasma*
 - Tuberculosis
 - Diphtheria
 - Tetanus
114. Example of anaerobic medium is:
- Nutrient agar
 - Selenite F broth
 - Robertson cooked-meat medium
 - MacConkey agar
115. All of following are waterborne diseases EXCEPT:
- Cholera
 - Scabies
 - Giardiasis
 - Salmonellosis
116. Existence of Tuberculosis in population of Faisalabad is an example of:
- Epidemic
 - Endemic
 - Pandemic
 - Sporadic
117. Mycotoxins are produced by:
- Bacteria
 - Viruses
 - Fungi
 - Protozoa
118. In polymerase chain reaction, extension step is done at temperature:
- 50-60 °C
 - 95 °C
 - 37 °C
 - 72 °C
119. Basophils have receptors for _____ antibodies.
- IgG
 - IgE
 - IgA
 - IgD
120. Enzymes are chemically:
- Lipids
 - Proteins
 - Carbohydrates
 - Lipoproteins
121. Which of the following has optimum growth temperature greater than 45°C?
- Mesophilic
 - Psychrophiles
 - Psychrophilic
 - Thermophiles
122. The enzyme _____ unzips and unwinds the DNA.
- DNA polymerase
 - Helicase
 - Primase
 - Reverse transcriptase
123. *Helicobacter pylori* possesses _____ that helps to neutralize stomach acid (HCl).
- Coagulase
 - Urease
 - Hyaluronidase
 - Catalase
124. Capnophiles bacteria grow at optimum in:
- Small percentage of CO₂
 - Excess CO₂
 - Excess of O₂
 - Absence of O₂
125. First line of body defense is:
- Antibody molecules
 - Antigen molecules
 - Phagocytic cells
 - Unbroken skin
126. 'Toxic shock syndrome' is caused by the toxin of:
- Staphylococcus aureus*
 - Streptococcus pyogenes*
 - Vibrio cholerae*
 - Proteus vulgaris*
127. _____ reagent is used to precipitate DNA.
- SDS
 - Isopropanol
 - Phenol
 - EDTA
128. The nosocomial infections are acquired from:
- Plants
 - Hospitals
 - Animals
 - Community
129. Virus family causing mumps is also responsible for:
- Hepatitis
 - Rabies
 - Measles
 - Smallpox
130. Carcinoma refers to
- Malignant tumors of the connective tissue
 - Malignant tumors of the colon
 - Malignant tumors of skin or mucus membrane
 - Malignant tumors of the lungs
131. Batch fermentation is also called:
- Open system
 - Closed system
 - Sub-merger system
 - Continuous system

132. Live bacterial cells can be examined:

- A. In dark field microscope
- B. After Gram staining
- C. After special staining
- D. Acid-fast staining

133. IgM type of antibodies has been found to occur in:

- A. Monomer
- B. Dimer
- C. Trimer
- D. Pentamer

134. Which sequence is a palindrome?

- A. 5'-GATTA-3'
- B. 5'-GACTTT-3'
- C. 5'-GACCAA-3'
- D. 5' AGGCCT 3'

135. Bacterial cells are at their metabolic peak during:

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

136. The antibiotic acting on cell was is:

- A. Chloramphenicol
- B. Rifampin
- C. Polymyxins
- D. Penicillin

137. Which of the following is a motile bacterium?

- A. *Klebsiella pneumoniae*
- B. *Bacillus anthracis*
- C. *Proteus vulgaris*
- D. *Shigella flexneri*

138. Migration of leukocytes in response to specific chemicals towards the site of injury or infection:

- A. Specific immunity
- B. Phagocytosis
- C. Inflammation
- D. Chemotaxis

139. _____ is a vector to transmit Dengue virus to man.

- A. Male Culex
- B. Male Aedes
- C. Female Aedes
- D. Female Culex

140. The organisms which grow best in the presence of a low concentration of oxygen:

- A. Microaerophilic
- B. Anaerobic
- C. Facultative anaerobic
- D. Obligate aerobes

141. Which one the following blood cells primarily functions as phagocytic cells?

- A. B-lymphocytes
- B. T-lymphocytes
- C. Eosinophils
- D. Neutrophils

142. Acquired immunity is:

- A. Natural
- B. Artificial
- C. Active
- D. All of these

143. Formation of nitrate from ammonia is called:

- A. Ammonification
- B. Denitrification
- C. Nitrogen fixation
- D. Nitrification

144. Main site of action of tetanus toxin:

- A. Muscle fibers
- B. Neuromuscular junction
- C. Postsynaptic terminal of spinal cord
- D. Presynaptic terminal of spinal cord

145. Which of the following is a start codon?

- A. GUG
- B. UGA
- C. GAA
- D. AUG

146. Acquisition of naked DNA by intact bacteria is:

- A. Transduction
- B. Transcription
- C. Conjugation
- D. Transformation

147. T4 enzyme is an example of:

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

148. _____ are thin and help in attachment and colonization.

- A. Fimbriae
- B. Sex pilli
- C. Capsule
- D. Cell wall

149. _____ is the killing of all microorganisms both in vegetative and sporing states.

- A. Disinfection
- B. Pasteurization
- C. Sterilization
- D. Antisepsis

150. _____ technique requires previously diluted samples carpeted over agar plate.

- A. Streak plate
- B. Spread plate
- C. Pour plate
- D. Stab tube

151. _____ is Gram positive spherical & chain forming.

- A. *Streptococcus*
- B. *Staphylococcus*
- C. *Bacillus*
- D. Diplococcus

152. Negri bodies are observed in cells infected by:

- A. Cytomegalovirus
- B. Rabies virus
- C. Herpes simplex virus
- D. Pox virus

153. Temperature of autoclave at 15 psi will be _____.

- A. 110°C
- B. 115°C
- C. 121°C
- D. 125°C

154. ____ is a culture medium having liquid consistency.
- Broth
 - Agar
 - Soft agar
 - All of these
155. Which of the following is an example acid-fast bacterium?
- Vibrio*
 - Staphylococcus*
 - Mycobacterium*
 - Leptospira*
156. _____ is a pigment giving golden color to colonies.
- Catalase
 - Staphyloxanthin
 - Coagulase
 - Hemolysin
157. Streptolysin O is inactivated by _____.
- CO₂
 - Nitrogen
 - Oxygen
 - Serum
158. Influenza virus genome is _____?
- dsRNA
 - ssRNA
 - dsDNA
 - ssDNA
159. All are accessory proteins of HIV EXCEPT?
- Vif
 - Tat
 - Vpu
 - Vpr
160. Trichomoniasis can be diagnosed by _____.
- Demonstration of cysts by fecal examination
 - Acidic vaginal pH
 - Whiff test
 - Demonstration of oocysts by fecal examination
161. All Gram-Negative bacilli have _____?
- Capsule
 - Exotoxin
 - Endotoxin
 - DNase
162. _____ can cause food INTOXICATION?
- Staphylococcus aureus*
 - Streptococcus pyogenes*
 - E. coli*
 - Salmonella*
163. Enhancement of size using ocular and objective lens is called _____.
- Magnification
 - Resolution
 - Contrast
 - All of these
164. _____ contains substances favoring the growth of organism being sought.
- Selective
 - Enrichment
 - Differential
 - General purpose
165. Which of the following is an example general purpose medium is _____?
- Selenite F broth
 - Mannitol salt agar
 - MacConkey agar
 - Nutrient agar
166. MacConkey agar, it differentiates b/w _____ fermenting and non-fermenting bacteria.
- glucose
 - lactose
 - mannitol
 - sucrose
167. BCG vaccine is used for the prevention of ____.
- Botulism
 - Tuberculosis
 - Cholera
 - Anthrax
168. What is the reservoir for *Treponema pallidum*?
- Humans
 - Wild rodents
 - Soil
 - Domestic Animals
169. All protozoan pathogens have a _____ phase?
- Cyst
 - Sexual
 - Trophozoite
 - latent
170. All are correct for *Giardia lamblia* EXCEPT?
- It has only trophozoite stage.
 - It is transmitted by the fecal oral route.
 - It can be diagnosed by the string test
 - It is a heart shape protozoan.
171. Cholera toxin is a form of _____.
- Exotoxin
 - Endotoxin
 - Neurotoxin
 - Hemolytic toxin
172. If viral 'DNA' integrates in host cell chromosomes, with no progeny production, process is called:
- Lytic cycle
 - Lysogenic cycle
 - Replicative cycle
 - Translational cycle
173. Cell-mediated immune response is mediated by:
- B-lymphocytes
 - Endothelial cells
 - T-lymphocytes
 - Granulocytes
174. Passive immunity lasts for the period of:
- About 10-days
 - 6-9 months
 - 9-10 years
 - All of the above
175. _____ is an endospore forming AEROBIC bacteria.
- Bacillus anthracis*
 - Clostridium botulinum*
 - Bacillus and Clostridium*
 - Staphylococcus aureus*

176. Sporulation is a process of _____.
- Reproduction
 - Preservation
 - Replication
 - None of these
177. Thickest layer of spore envelope is _____.
- Core
 - Spore wall
 - Cortex
 - Spore coat
178. India ink is an example of _____.
- Principle stain
 - Basic stain
 - Counter stain
 - Acidic stain
179. 100X objective lens is also known as _____.
- Dry lens
 - High dry lens
 - Scanning lens
 - Oil immersion lens
180. Rod shaped bacteria are known as _____.
- Cocci
 - Bacilli
 - Vibrio
 - Coco-bacilli
181. Mordant used in Gram's staining is _____.
- Acid alcohol
 - Safranin
 - Gram's iodine
 - Crystal violet
182. _____ is an instrument effectively used to sterilize metals, glassware, powders, oils, and waxes.
- Autoclave
 - Hot air oven
 - Water bath
 - Seitz filter
183. Bacteria that can only be grown in the absence of oxygen, are commonly cultivated in _____.
- Deep agar tube
 - Anaerobic jar
 - Both "A" and "B"
 - Broth culture
184. Visible growth of bacteria on solid medium is ____.
- colony
 - turbidity
 - sediment
 - None of these
185. Immune individuals will not harbor it thus reducing occurrence of pathogens is concept of _____.
- Innate immunity
 - Herd immunity
 - cell mediated immunity
 - Autoimmunity
186. Sugar solution is commonly sterilized by _____.
- Autoclave
 - Hot air oven
 - Filtration
 - X-rays
187. A culture containing a single kind of microorganisms is known as ____.
- Colony culture
 - Liquid culture
 - Mixed culture
 - Pure culture
188. ____ is major Ig present in human serum & can provide naturally acquired immunity for new born?
- IgA
 - IgG
 - IgE
 - IgM
189. Failure to eliminate self-reactive cells results in ____.
- Negative selection
 - Autoimmunity
 - Positive Selection
 - Tolerance
190. Active immunity is induced by:
- Injection of γ -globulins
 - Placental transfer of Abs
 - Injection of antibodies
 - Infection
191. T-cells are produced from:
- Bone marrow
 - Thymus
 - Spleen
 - Thyroid gland
192. Antibodies are produced from:
- T lymphocytes
 - Plasma Cells
 - NK cells
 - Eosinophils
193. Immunological memory is provided by:
- B lymphocytes
 - T lymphocytes
 - B cells and T cells
 - Phagocytes
194. In human body "*Brucella*" resides in the:
- Reticuloendothelial system
 - Respiratory tract
 - Genital Tract
 - Gastrointestinal tract
195. Light chain does not originate from ____ region.
- variable
 - diversity
 - joining
 - constant
196. Vaccine used against viral infection is:
- Mumps vaccine
 - Cholera vaccine
 - Sub-cellular vaccine
 - Typhoid vaccine
197. _____ immune cells mainly act against helminth worm?
- Lymphocytes
 - Eosinophils
 - Basophils
 - Neutrophils

198. Monoclonal antibodies recognize a single:

- A. Antigen
- B. Bacterium
- C. Epitope
- D. B cell

199. Which of the following cells do not have MHC class II surface molecules?

- A. Ig producing plasma cells
- B. Dendritic cells
- C. Cytotoxic T cells
- D. Macrophages

200. Small chemical groups on the antigen molecule that can react with antibody:

- A. Epitope
- B. Paratope
- C. Isotope
- D. Allotope

201. To be antigen, the chemical molecule (protein) needs:

- A. High molecular weight
- B. Chemical complexity
- C. High MW and chemical complexity
- D. Nucleic acid

202. The immunity acquired by inoculation of living organism of attenuated virulence is:

- A. Artificial active immunity
- B. Passive immunity
- C. Natural active immunity
- D. Local immunity

203. Fluid extruded from clotted blood is known as ____.

- A. Plasma
- B. Serum
- C. buffy coat
- D. Lymph

204. Which PRR recognizes distinct molecular structures, abundant to many cells and there is ten in humans?

- A. Nod-like receptors
- B. RIG-like receptors
- C. Toll-like receptors
- D. PAMP of neutrophils

205. A signaling molecule from microbes recognized by phagocytes is:

- A. Complement
- B. PAMP
- C. Pyrogen
- D. Lectin

206. Which of the following is NOT produced by phagocytes?

- A. Hydroxyl radical
- B. Superoxide anion
- C. Hydrogen peroxide
- D. Bradykinin

207. Acquired / adaptive immune cells include?

- A. Lymphocytes
- B. Eosinophils
- C. Basophils
- D. Neutrophils

208. Reproduction in bacteria occurs by:

- A. Budding
- B. Bursting
- C. Binary Fission
- D. Fragmentation

209. Bacteria eating viruses are known as:

- A. Phagocytes
- B. Viricides
- C. Prophages
- D. Bacteriophages

210. Which of the following is Gram-positive bacteria?

- A. Staphylococcus
- B. *E. coli*
- C. *Salmonella*
- D. *Pseudomonas*

211. In plasmid DNA isolation, _____ is used to neutralize the solution, enabling DNA to renature.

- A. NaCl
- B. potassium acetate
- C. acetic acid
- D. All of these

212. In genomic DNA isolation, disruption of nucleoproteins and degradation of proteins is carried out by:

- A. SDS
- B. proteinase K
- C. isopropanol
- D. Alcohol

213. "Cryptococcus" is transmitted in form of:

- A. Endospores
- B. Yeast
- C. Conidia
- D. Spores

214. Selective media for TB bacilli is:

- A. NNN media
- B. Lowenstein-Jensen (LJ) medium
- C. Mannitol Salt Agar (MSA)
- D. MacConkey media

215. Widal test is used for:

- A. Typhoid fever
- B. Salmonella
- C. Brucellosis
- D. All of these

216. Cell wall of 'fungi' is made up of:

- A. Peptidoglycan
- B. Murine
- C. Chitin
- D. Cellulose

217. Ascoli's test helps to confirm lab diagnosis of ____.

- A. Tetanus
- B. Anthrax
- C. Typhoid
- D. Cholera

218. Transfection is insertion of DNA into _____ cells.

- A. bacterial
- B. eukaryotic
- C. Viruses
- D. Both "A" and "B"

219. In agarose gel electrophoresis, loading buffer gives _____ to sample.

- A. Color
- B. Density
- C. Shade
- D. Color and density

220. The virulence factor of botulism is a/an _____.

- A. Endotoxin
- B. Enterotoxin
- C. Neurotoxin
- D. Hemolysin enzyme

221. Which of the following is a spirochete?

- A. Gonococci
- B. Treponema
- C. *Staphylococcus*
- D. *Streptococcus*

222. Once the Phagosome and lysosome fuse, the structure is known as:

- A. Lysophagosome
- B. Macrophage
- C. Membrane attack complex
- D. Phagolysosome

223. T-lymphocytes mature in which tissue/organ?

- A. Thyroid
- B. Bone marrow
- C. Thymus
- D. Tonsils

224. Place following events of phagocytosis in the order. 1.Chemotaxis 2.Ingestion 3.Digestion 4.Attachment

- A. 1,2,4,3.
- B. 4,1,2,3.
- C. 1,4,2,3.
- D. 4,2,3,1.

225. An enzyme found in our tears, saliva, serum, and mucus that degrades the peptidoglycan of the cell wall of Gram-positive bacteria is called?

- A. Amylase
- B. Lysozyme
- C. Keratinase
- D. Peptidase

226. Internalization of the pathogen via endocytosis encase the pathogen in a membrane vacuole known as a?

- A. Lipid bilayer
- B. Lysosome
- C. Phagosome
- D. Phagolysosome

227. Which of the following is primarily human pathogenic bacteria?

- A. *S. typhi*
- B. *E. coli*
- C. *S. aureus*
- D. *Mycobacterium*

228. An enrichment medium for *Salmonella* is _____.

- A. Alkaline peptone water
- B. MacConkey broth
- C. Nutrient broth
- D. Selenite F broth

229. TE buffer functions as:

- A. Maintain pH
- B. Block endonucleases
- C. Both "A" and "B"
- D. Denature proteins

230. Agarose gel electrophoresis is a widely used method that separates molecules based on:

- A. Electrical charge
- B. Size
- C. Shape
- D. All of these

231. A 25-year-old medical technology student interning in a clinical microbiology laboratory is diagnosed with brucellosis. How could accidental exposure in a laboratory setting occur?

- A. Working with *Brucella* on an open bench
- B. Direct contact with abraded skin
- C. Ingestion
- D. All of these

232. 0.7% agarose gel provides good resolution for _____ DNA, while 2% gel for _____ DNA.

- A. Large, small
- B. small, large
- C. Both 'A' & 'B'
- D. None of these

233. Innate immunity involves all EXCEPT?

- A. Anatomical barriers
- B. Phagocytosis
- C. Inflammatory mechanisms
- D. Antibody production

234. You enter a dusty room, feel an itch in your nose, and sneeze. This is an example of the operation of which of the following innate immune mechanism?

- A. The low pH of the environment.
- B. The physical barrier produced by hairs.
- C. Phagocytosis by macrophages.
- D. Mucus joint with movement of cilia of lining cells.

235. Which of the following is a distinction between the innate and adaptive immune systems?

- A. Only one system to produce cytokines.
- B. Antigenic specificity in only one system.
- C. Only one system to recognize virally infected cells.
- D. Only one system to mediate cell cytotoxicity.

236. Stomach clears out pathogens by?

- A. Secreting HCl
- B. Normal microflora
- C. Phagocytosis
- D. All of these

237. Kupffer cells are macrophages found in _____.

- A. Lung
- B. Bone
- C. Kidney
- D. Liver

238. Temperature rising chemicals are?

- A. Thermogens
- B. Pyrogens
- C. Pyogenic
- D. All of these

239. Physical barriers of immune system are:

- A. Skin and the mucosal membranes.
- B. Skin, body temperature and mucosal membranes.
- C. Skin, inflammation and the mucosal membranes.
- D. The bones and the mucosal membranes.

240. Chemical barriers include:

- A. Tears, sweat, saliva, stomach acid and feces.
- B. Tears, breast milk, sweat, saliva, stomach acid.
- C. Hair, breast milk, sweat, saliva, stomach acid.
- D. Tears and urine.

241. Interferons protect which of the following?

- A. Only viral infected cells
- B. Only bacterial infected cells
- C. Healthy host cells
- D. Blood cells

242. RNA contains:

- A. Alanine
- B. Thymidine
- C. Uracil
- D. Arginine

243. Time taken for a bacterium to multiple from 1 to 2?

- A. Incubation time
- B. Growth rate
- C. Generation time
- D. Both "B" and "C"

244. Self-replicating, small circular DNA molecules present in bacterial cell are known:

- A. Plasmids
- B. Cosmids
- C. Plasmomeros
- D. Plastids

245. Some of the dust particles are not expelled by sneeze and make their way further down the respiratory tract but not yet into the alveolar space. Here their elimination is the job of which of the following?

- A. Released granular contents of your granulocytes.
- B. The low pH of the environment.
- C. The physical barrier produced by hairs.
- D. Mucus joint with movement of cilia of lining cells

246. Formation of proteins in ribosomes occur through process known as:

- A. Central dogma
- B. Transcription
- C. Translation
- D. Both "A" and "C"

247. Mostly bacteria grow in aerobic conditions, but some require more CO₂ for their growth, these are known as:

- A. Halophiles
- B. Acidophiles
- C. Capnophiles
- D. Hyperthermophiles

248. Transfer of antibodies from mother to her baby through breast milk is example of:

- A. Active natural acquired immunity
- B. Passive artificial acquired immunity
- C. Passive natural acquired immunity
- D. Active artificial acquired immunity

249. Penicillin is an antibiotic obtained from:

- A. A capsular bacterium
- B. A yeast
- C. A fungus
- D. An alga

250. Viruses that infect bacteria are known as _____.

- A. virons
- B. bacteroids
- C. bacteriophages
- D. retroviruses

251. The Kingdom of recyclers is known as _____.

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

252. Unicellular yeast cells reproduce by _____.

- A. Sporing
- B. Conidiation
- C. Budding
- D. Both "A" and "B"

253. Interferons protect healthy cells by production of?

- A. Antibacterial proteins
- B. Antifungal proteins
- C. Antiviral proteins
- D. Antiprotozoal proteins

254. Branch of Microbiology related with study of fungi:

- A. Protozoology
- B. Phycology
- C. Mycology
- D. Biotechnology

255. Penicillin acts by inhibiting:

- A. Cell wall synthesis
- B. RNA synthesis
- C. Folate synthesis
- D. DNA gyrase

256. Schizogony is mode of reproduction in:

- A. Algae
- B. Protozoa
- C. Fungi
- D. Embryophata

257. Disease that effects many people at different countries is termed as:

- A. Sporadic
- B. Epidemic
- C. Pandemic
- D. Endemic

258. Some bacteria form dormant structure during harsh environmental conditions is known as:

- A. Endospore
- B. Capsule
- C. Cyst
- D. Bud

259. Many clostridial diseases require a/an _____ environment for their development.

- A. living tissue
- B. anaerobic
- C. aerobic
- D. low-pH

- 260. Bacterial cells multiply rapidly during:**
- Lag phase
 - Log phase
 - Death phase
 - Stationary phase
- 261. A group of fungal hyphae are called _____.**
- Filtering body
 - Mycelia
 - Conidia
 - Yeast
- 262. Most human pathogenic bacteria are:**
- Psychrophiles
 - Psychrotrophes
 - Thermophiles
 - Mesophiles
- 263. DNA contains:**
- Alanine
 - Thymine
 - Uracil
 - Arginine
- 264. Type of immunity through vaccination is:**
- Active natural acquired immunity
 - Passive artificial acquired immunity
 - Passive natural acquired immunity
 - Active artificial acquired immunity
- 265. Shrinkage of the cell occur in _____ environment.**
- Hypotonic
 - Hypertonic
 - Isotonic
 - None of these
- 266. Bacterium is _____ type of organism.**
- Prokaryotic
 - Eukaryotic
 - Acellular
 - May be prokaryotic or eukaryotic
- 267. Botulin toxin prevents release of what chemical that initiates the signal for muscle contraction?**
- Serotonin
 - Acetylcholine
 - Dopamine
 - Norepinephrine
- 268. An infection peculiar to swine causes _____ when transmitted to humans.**
- Anthrax
 - Diphtheria
 - Tuberculosis
 - Erysipeloid
- 269. _____ DOES NOT predispose to gas gangrene?**
- Surgical incisions
 - Compound fractures
 - Puncture wounds
 - Dislocated shoulder
- 270. In general, humans are rather prone to _____ with tubercle bacillus but are resistant to _____?**
- disease, infection
 - infection, disease
 - TB, Leprosy
 - Leprosy, TB
- 271. Malaria is caused by pathogen known as _____.**
- Plasmodium
 - Paramecium
 - Pseudomonas
 - Pasteurella
- 272. First phase of a bacterial growth curve is**
- Log phase
 - Lag phase
 - γ phase
 - Exponential
- 273. Spirochete bacteria move with the help of:**
- Pseudopodia
 - Axial filament
 - Endoflagella
 - Both "B" and "C"
- 274. Viruses are:**
- Living
 - Non-Living
 - Only living inside cells
 - Capsular
- 275. All of the following prokaryotes are bounded by a cell wall EXCEPT:**
- Spirochetes*
 - Actinomyces*
 - Mycoplasma*
 - Streptococcus*
- 276. Tubercles are granulomas with a central core containing TB bacilli and enlarged _____.**
- Neutrophils
 - Lymphocytes
 - Eosinophils
 - Macrophages
- 277. Conversion of DNA to RNA is:**
- Transcription
 - Transduction
 - Translation
 - Replication
- 278. The bases Adenine and Thymine are paired with:**
- Double hydrogen bonds
 - Single hydrogen bonds
 - Triple hydrogen bonds
 - Both "B" and "C"
- 279. Fungi reproduce by:**
- Sexual Spores
 - Fragmentation
 - Asexual spores
 - All of these
- 280. For TB control, vaccine is based on attenuated "Bacille Calmette-Guérin" (BCG) strain of _____.**
- Mycobacterium tuberculosis*
 - Mycobacterium avium complex*
 - Mycobacterium bovis*
 - Mycobacterium paratuberculosis*
- 281. Antibiotics are the drugs which commonly kill?**
- Bacteria
 - Virus
 - Algae
 - Protozoa

282. Genital herpes is caused by?
- HSV-1
 - HSV-2
 - HSV-3
 - HSV-4
283. Blood agar is an example of:
- Enrichment media
 - Selective media
 - Enriched media
 - General purpose media
284. A mutation that produces termination codon is:
- Mis-sense mutation
 - Reverse mutation
 - Non-sense mutation
 - Frame shift mutation
285. Gas gangrene bacillus is:
- Facultative anaerobe
 - Obligate aerobe
 - Facultative aerobe
 - Obligate anaerobe
286. If vector ONLY transmits pathogen is called:
- Biological vector
 - Biological reservoir
 - Biological carrier
 - Mechanical vector
287. What genus of organisms is important as decomposers and involve in bioremediation?
- Pseudomonas
 - Brucella
 - Francisella
 - Bordetella
288. Brucellosis is spread from human-to-human contact with ALL BUT which of the following?
- Blood
 - Urine
 - Placenta
 - Cerebrospinal fluid
289. What enzyme possessed by *Helicobacter pylori* helps to neutralize stomach acid?
- Coagulase
 - Urease
 - Hyaluronidase
 - DNase
290. The technique used to kill all microorganisms is:
- Disinfection
 - Sterilization
 - Antisepsis
 - Pasteurization
291. Glassware are sterilized by:
- Hot air oven
 - Autoclave
 - Incineration
 - Boiling
292. _____ CAN NOT be found in the lymph node?
- Lymphoid follicle
 - B cells
 - Red pulp
 - T cells
293. Virulence of tubercle bacillus is due to _____ that avoid destruction by lysosomes/macrophages.
- Exotoxin
 - Cord factor
 - Enterotoxin
 - Endotoxin
294. The form of leprosy associated with severe disfigurement of the face is:
- Tuberculoid
 - Lepromatous
 - Borderline
 - Papular
295. Diphtheria is caused by:
- Staphylococcus*
 - Corynebacterium*
 - Bacillus*
 - Clostridium*
296. _____ reside in sebaceous glands in human skin?
- Bacillus*
 - Propionibacterium*
 - Erysipelothrix*
 - Corynebacterium*
297. The largest virus is:
- Parvo virus
 - Picorna virus
 - Pox virus
 - HIV
298. Endospores can be stained with:
- Malachite green
 - Safranin
 - Methylene blue
 - Crystal Violet
299. All of the following are DNA viruses EXCEPT:
- Parvo virus
 - Pox virus
 - Polio virus
 - Hepatitis B Virus
300. Comparing the two, *Actinomyces* _____ sulfur granules and *Nocardia* is _____.
- Form; Acid-fast
 - Form; Not acid-fast
 - Does not form; Acid-fast
 - Does not form; Not acid-fast
301. _____ fungi that can exist as a mold as well as yeast.
- Hyphae
 - Tinea pedis
 - Dimorphic
 - Spore forming
302. The viruses that attack bacteria are:
- Bacteriophages
 - Bacterial viruses
 - Bacterial pathogens
 - Virions
303. Fungal hyphae may be:
- Septate
 - Non-septate
 - Branched
 - All of these

304. Where are target cells of diphtherotoxin located?

- A. The skin
- B. The skeletal muscles
- C. The lungs
- D. The heart and nervous system

305. Fusion of nuclei in fungi is:

- A. Karyogamy
- B. Progamy
- C. Microgamy
- D. Pregamy

306. Which of the following is a purine?

- A. Adenine
- B. Thymine
- C. Uracil
- D. Cytosin

307. Substitutions that prematurely stops synthesis of protein, by generating stop codon, called as:

- A. Missense mutation
- B. Nonsense mutation
- C. Frameshift mutation
- D. Alternation

308. What type of vaccine is the anthrax vaccine?

- A. Attenuated bacteria
- B. Toxoid
- C. Killed whole bacterial cells
- D. Recombinant

309. Tuberculosis is spread by:

- A. Contaminated fomites
- B. Food
- C. Respiratory droplets
- D. Vectors

310. What causes the major symptoms of tetanus?

- A. Production of tetanospasmin
- B. Multiplication of organisms at the site of infection
- C. Production of botulin toxin
- D. Superinfection due to antibiotic therapy

311. *Clostridium difficile* is associated with:

- A. Myonecrosis
- B. Food poisoning
- C. Antibiotic-induced colitis
- D. Gas gangrene

312. Which of the following can swarm on a plate, making it difficult to distinguish colonies?

- A. *E. coli*
- B. *Shigella dysenteriae*
- C. *Salmonella typhi*
- D. *Proteus vulgaris*

313. Only one of the followings is characteristic of B-cell but not T-cells:

- A. Class I MHC
- B. CD3
- C. Polyclonal activation by concanavalin A
- D. Surface immunoglobulin

314. Robert Koch developed his postulates using _____.

- A. *Bacillus cereus*
- B. *Clostridium tetani*
- C. *Bacillus anthracis*
- D. *Staphylococcus aureus*

315. How are most cases of listeriosis transmitted?

- A. Insect vectors
- B. Respiratory secretions
- C. Transplacental
- D. Contaminated food

316. Which infectious agent is an obligate parasite?

- A. *Mycobacterium tuberculosis*
- B. *Corynebacterium diphtheriae*
- C. *Mycobacterium leprae*
- D. *Clostridium difficile*

317. Which infection can be considered as zoonosis?

- A. Anthrax
- B. Gas gangrene
- C. Diphtheria
- D. leprosy

318. Bacterial cells divide by:

- A. Budding
- B. Binary Fission
- C. Spores
- D. Sexual reproduction

319. A classic symptom of pertussis is:

- A. Diarrhea
- B. Paroxysmal coughing
- C. Convulsions
- D. Headache

320. Complications of typhoid fever are:

- A. Neurological damage
- B. Intestinal perforation
- C. Liver abscesses
- D. Both "B" and "C"

321. How are *Leptospira* species transmitted from their animal reservoirs to humans?

- A. Animal bites
- B. Arthropod vectors
- C. Contact with urine from an infected animal
- D. Inhalation

322. Coliforms are used as indicator organisms of sewage pollution because _____.

- A. They are pathogens
- B. They ferment lactose
- C. They are abundant in human intestines
- D. All of the above

323. A patient with nausea, vomiting, and diarrhea within 5 hours after eating most likely has:

- A. Shigellosis
- B. *E. coli* gastroenteritis
- C. Salmonellosis
- D. Intoxication

324. The bubo of bubonic plague is a/an:

- A. Ulcer where the flea bite occurred
- B. Granuloma in the skin
- C. Enlarged lymph node
- D. Infected sebaceous gland

325. *Escherichia coli* displays which antigens?

- A. Capsular
- B. Flagellar
- C. Somatic
- D. All of these

326. Cardinal manifestation of human brucellosis is:
- Vomiting and diarrhea
 - A pseudo-membrane in the throat
 - A fluctuating pattern of fever
 - Peeling of the skin on the palms and soles
327. Which is not a characteristic of coliform group?
- Non-glucose fermenting
 - Lactose fermenting
 - Oxidase negative
 - Gram negative rods
328. Which one is NOT discovered by Robert Koch?
- Bacillus anthracis*
 - Mycobacterium tuberculosis*
 - Salmonella typhi*
 - Vibrio cholerae*
329. What stage of syphilis has disseminating rash, alopecia, lymphadenopathy, & flulike symptoms?
- Primary syphilis
 - Secondary syphilis
 - Tertiary syphilis
 - Congenital syphilis
330. Which one would be unsusceptible to penicillin?
- Leptospira*
 - Mycoplasma*
 - Chlamydia*
 - Rickettsia*
331. Lyme disease is caused by _____ & spread by _____.
- Borrelia recurrentis*, lice
 - Borrelia hermsii*, ticks
 - Borrelia burgdorferi*, chiggers
 - Borrelia burgdorferi*, ticks
332. Which of following cells do not have MHC II molecules?
- Antibody producing B cells
 - Cytotoxic T cells
 - Dendritic cells
 - Macrophages
333. Indole test indicates the cleavage of _____.
- Lactose
 - Tryptophan
 - Glucose
 - Tyrosine
334. What is the most common human disease?
- Walking pneumonia
 - Strep throat
 - Tuberculosis
 - Dental caries
335. Which of following is related with *Ureaplasma*?
- Genitourinary tract infection
 - Atypical pneumonia
 - Tracheobronchitis
 - Influenza-like illness
336. 'Penicillin' is a drug, destroying cells, if they are in a growing stage, so penicillin is known to be a:
- Bacteriocins
 - Bactericidal
 - Bacteriostatic
 - Bacteria inhibiting
337. Primary virulence factor for *E. coli* is _____.
- Inflammatory response
 - cAMP inducing toxin
 - Toxin disrupts protein synthesis
 - Superantigen
338. Sweat glands produces enzymes like lysozymes, which is more effective against _____.
- Gram Negative Cell Wall
 - Gram Positive Cell Wall
 - Viruses
 - Parasites
339. *Mycoplasmas* attack the _____ of host cells.
- Nucleus
 - Ribosomes
 - Mitochondria
 - Cell membranes
340. *Rickettsia* and *chlamydia* are similar in being:
- Free of a cell wall
 - The cause of eye infections
 - Carried by arthropod vectors
 - Obligate intracellular bacteria
341. What stage(s) of *Chlamydia* is/are infectious?
- Reticulate body
 - Vegetative cell
 - Elementary body
 - Both "A" and "B"
342. Endotoxin is responsible for symptoms caused by which of the following organisms?
- Neisseria meningitidis*
 - Streptococcus pyogenes*
 - Clostridium. tetani*
 - Bacillus anthracis*
343. Which of the following blood cells function primarily as phagocytes in parasitic infections?
- Lymphocytes
 - Eosinophils
 - Basophils
 - Neutrophils
344. What is characteristic of primary syphilis?
- Painful chancre
 - Painless chancre
 - Several painful ulcers in genital region
 - Several painless ulcers in genital region
345. _____ can recognize MHC I molecules.
- B-lymphocyte
 - CD4 + lymphocyte
 - CD8 + T lymphocytes
 - Monocytes
346. APCs can be all but which of the following?
- B-cells
 - Dendritic cells
 - Macrophages
 - T-helper cells
347. Light chains and heavy chains are joined by:
- Covalent bond
 - Hydrogen bond
 - di-sulphide bond
 - ionic bond

348. Which one of the following is NOT a structural chain in class I MHC?
- Alpha-1
 - Alpha-2
 - Beta-1
 - Beta-2
349. Complement component C3 can be cleaved by:
- C3b
 - C3bBb
 - Factor B
 - Factor D
350. At what age does thymus reach its maximal size?
- During the first year of life
 - Teenage years (puberty)
 - Between 40 and 50 years of age
 - After 70 years of age
351. Which of following mediates an initial response to viral infections by the innate immune system?
- Complement components
 - T and B lymphocytes
 - Cytokines
 - Interferons
352. Which one is a messenger that mediates connection between the innate and adaptive immune systems?
- Complement components
 - T and B lymphocytes
 - Cytokines
 - Interferons
353. _____ are resident macrophages present in CNS.
- Kupffer cells
 - Alveolar cells
 - Microglial cells
 - Langerhans
354. If you were a neutrophil recruited to an anaerobic site to kill such a bacterium, which of the following substances would you most likely use?
- IL-12
 - Nitric oxide
 - Cathelicidin
 - Respiratory burst oxidase
355. Which of the following is a "pattern recognition receptor"?
- BCR
 - Interleukin-1 receptor
 - Mannose receptor
 - Fc receptor
356. A molecule that reacts with specific antibody but is not immunogenic by itself is called:
- Carrier
 - Antigen
 - Hapten
 - Immunogen
357. What type of vaccine is used to protect vulnerable individuals from influenza?
- It is an example of a subunit vaccine
 - It is an example of a live attenuated vaccine
 - It is an example of passive immunization
 - It is an example of a recombinant vaccine
358. The initial complement component that is bound by complement-fixing antibodies is:
- C1q
 - C1s
 - C3b
 - C5a
359. The _____ immune system uses _____ as well as antigen recognition molecules and the _____ immune system uses _____ as well as molecules (e.g., interferons).
- Adaptive; Phagocytes; Innate; Lymphocytes
 - Adaptive; Lymphocytes; Innate; Phagocytes
 - Innate; Phagocytes; Adaptive; Lymphocytes
 - Innate; Lymphocytes; Adaptive; Phagocytes
360. Which of the following immune cells uses antibodies as membrane bound receptors?
- T-helper cell
 - Cytotoxic T-cell
 - B-lymphocyte
 - Macrophage
361. Which of the complement pathway among various pathways will activate first?
- Classical pathway
 - Alternate pathway
 - Lectin pathway
 - All act simultaneously
362. Which one of the following is NOT usually included in physical barriers?
- Sweat glands
 - Salivary glands
 - Meibomian glands
 - Lacrimal glands
363. Which of the following is NOT lymphoid tissue?
- Thyroid gland
 - Spleen
 - Lymph node
 - GALT
364. Toll-like receptors are proteins on _____.
- skin cells that provide barriers to infection
 - viruses that stimulate immune reactions
 - phagocytes that recognize foreign molecules
 - lymphocytes that damage parasitic worms
365. _____ is NOT produced by phagocytes?
- hydroxyl radical
 - superoxide anion
 - hydrogen peroxide
 - bradykinin
366. _____ increases chemotaxis, phagocytosis & blood coagulation and serves as endogenous pyrogen.
- Interferon gamma
 - Histamine
 - Prostaglandin
 - Tumor Necrosis Factor
- A. Major Ig present in the human serum is
- IgG
 - IgA
 - IgE
 - IgM

367. _____ is an immune regulator of macrophage, B & T cells.
- Interferon Alpha
 - Interferon Beta
 - Interferon Gamma
 - All of these
368. T-cell antigen receptors are distinguished from antibodies by which of the following?
- TCRs are glycosylated
 - TCRs cannot interact with free antigen
 - T-Cell receptors bind various cytokines
 - T-Cell receptors bind complement to lyse cells
369. Which is LEAST likely to be involved in cell-mediated immunity?
- Macrophage
 - Eosinophils
 - Antibodies
 - T-lymphocytes
370. Which of the following can provide naturally acquired passive immunity for the newborn?
- IgA
 - IgG
 - IgE
 - IgM
371. The major molecules responsible for rejection of transplant is:
- Cytokine
 - Interferon
 - MHC molecule
 - Antibodies
372. Self-renew and ability to differentiate into diverse cell types are two capacities of?
- Pluripotent stem cell
 - Adult stem cell
 - Immature blood cells
 - None of these
373. Which of the following pathogen can counter stomach pH and produce infection in stomach?
- Mycobacterium tuberculosis*
 - Campylobacter jejuni*
 - Helicobacter pylori*
 - Salmonella typhi*
374. Natural infection will produce _____ acquired immunity.
- Natural passive
 - Artificial active
 - Natural active
 - Artificial passive
375. Interferon is composed of:
- Lipids
 - Lipoprotein
 - Glycoprotein
 - Nucleic acid
376. Delayed type of hypersensitivity is seen in:
- Penicillin allergy
 - Contact dermatitis
 - Arthus reaction
 - Anaphylaxis
377. MHC class I is a cell surface molecule present on:
- B cells
 - all nucleated cells
 - APCs
 - T cells
378. MHC class II is a cell surface molecule present on:
- B cells
 - all nucleated cells
 - APCs
 - T cells
379. Humoral immunity involves all the following EXCEPT:
- Tc cells
 - B cells
 - Antibodies
 - Plasma cells
380. _____ is artificial passive acquired immunity.
- γ -globulin injection
 - Inactivated vaccine
 - Ingestion of colostrum
 - Having infection
381. Antibodies
- are carbohydrates
 - are made from α & β chains
 - contain no CHOs
 - contain heavy & light chains
382. B-lymphocytes are involved in _____
- Humoral immunity
 - Cell-mediated immunity
 - Active immunity
 - Passive immunity
383. Hybridoma technique is used for:
- Monoclonal antibodies
 - Polyclonal antibodies
 - Both "A" and "B"
 - None of these
384. Example for cell-mediated immunity is/are:
- Tuberculin type
 - Contact dermatitis
 - Granulomatous
 - All of these
385. In _____ repair, first enzyme complex removes incorrect bases and second enzyme places with correct bases.
- Light repair
 - Back mutation
 - Excision repair
 - All of these
386. Antitoxin is used for _____ immunization.
- Active
 - Passive
 - Both "A" and "B"
 - None of these
387. The cell-mediated immune response is produced by:
- B lymphocytes
 - T lymphocytes
 - B & T lymphocytes
 - Endothelial cells

388. Which of the following DOES NOT kill endospores?

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

389. Virus mediated transfer of host DNA from one cell to another is known as:

- A. Transduction
- B. Transformation
- C. Conjugation
- D. Integration

390. Acquisition and expression genetic material by eukaryotic cells from the environment is known as:

- A. Transformation
- B. DNA ligase
- C. Transfection
- D. Transduction

391. Genes of a pathogen is inserted into a live carrier non-pathogen; recombinant expresses foreign genes:

- A. Subunit vaccine
- B. Killed vaccine
- C. Trojan horse vaccine
- D. Acellular vaccine

392. Class II MHC proteins are:

- A. Recognized by the CD8 protein
- B. Used to mark a cell for killing by cytotoxic T-cells
- C. Used to participate in helper function
- D. Not able to carry an antigen fragment

393. Active immunity can be induced by:

- A. Toxoids
- B. Subclinical infection
- C. Both "A" and "B"
- D. Antitoxin

394. _____ is the least abundant Igs in normal adult.

- A. IgA
- B. IgM
- C. IgD
- D. IgG.

395. Which of following is most resistant to antiseptics?

- A. Spore
- B. Prion
- C. Cyst
- D. Fungus

396. Which of the following is enrichment media?

- A. Selenite F broth
- B. Chocolate media
- C. Egg media
- D. Meat extract media

397. Lyophilization is:

- A. Holding at 72° C for 15 seconds
- B. Competitive inhibition
- C. Freeze-drying
- D. Sterility testing

398. Gene mutation occurs at the time of:

- A. DNA repair
- B. DNA replication
- C. Translation
- D. RNA transcription

399. All of the following can be part of innate immune responses EXCEPT:

- A. B-cells
- B. Alternative pathway of complement system
- C. Natural killer cells
- D. Macrophages

400. The cellular immune response is mediated by:

- A. B cells
- B. T cell
- C. B & T cells
- D. Endothelial cells

401. To influence microbes, mutation must be:

- A. Inheritable
- B. Permanent
- C. Beneficial
- D. Both 'A' & 'B'

402. Which of following features is NOT true for plasmid?

- A. It is a circular piece of DNA.
- B. It is required for normal cell function.
- C. It is found in bacteria.
- D. It can be transferred from cell to cell.

403. What is the smallest unit of heredity?

- A. Chromosome
- B. Gene
- C. Codon
- D. Nucleotide

404. _____ is 'general feeling of illness and discomfort'.

- A. Cystitis
- B. Malaise
- C. Arthritis
- D. Lymphopenia

405. Point mutation involves

- A. Deletion
- B. Insertion
- C. Duplication
- D. Change in single base pair

406. _____ does not have any normal microbiota.

- A. Upper respiratory tract
- B. Ovary
- C. External genitalia
- D. Skin

407. Salt and sugar preserve food because they:

- A. Make them acid
- B. Produce a hypotonic environment
- C. Produce a hypertonic environment
- D. Deplete nutrients

408. An infant with neonatal meningitis has a positive CAMP test, the causative agent is:

- A. *Staphylococcus aureus*
- B. *E. coli*
- C. *Streptococcus agalactiae*
- D. *Haemophilus*

409. _____ two hallmarks of the adaptive immune system?

- A. Immediate and Broad
- B. Innate and Short
- C. Specificity and Memory
- D. Non-specific and Fast

410. Which of the following mutations would likely to cause the greatest impact?

- A. Silent
- B. Missense
- C. Nonsense
- D. Inversion

411. X-rays causes mutation by:

- A. Deletion
- B. Transition
- C. Transversion
- D. Base substitution

412. All Gram-Negative bacilli have _____?

- A. Capsule
- B. Exotoxin
- C. Coagulase
- D. Endotoxin

413. _____ enzyme of HIV-1 converts RNA to DNA.

- A. Protease
- B. Integrase
- C. Reverse transcriptase
- D. RNase

414. *Leptospira* is transmitted (animal to human) by?

- A. Animal scratch
- B. Contact with urine from infected animal
- C. Animal bite
- D. Arthropod vector

415. Which causes food INTOXICATION?

- A. *Clostridium tetani*
- B. *Staphylococcus aureus*
- C. *Streptococcus pyogenes*
- D. *Salmonella*

416. Crimean-Congo hemorrhagic fever (CCHF) is transmitted by a vector i.e. _____.

- A. Mosquitoes
- B. Ticks
- C. Fleas
- D. Sand-fly

417. All are correct for *Giardia lamblia* EXCEPT?

- A. It is transmitted by the fecal oral route.
- B. It has only trophozoite stage.
- C. It can be diagnosed by the string test
- D. It can divide by binary fission.

418. All are correct for anthrax bacilli EXCEPT?

- A. They are spore forming.
- B. They are non-fastidious.
- C. They produce endotoxin.
- D. They have polypeptide capsule.

419. Culture media are commonly sterilized by:

- A. Autoclaving
- B. β -radiation
- C. Hot air oven
- D. Tyndallization

420. All of the following are functions of IgG EXCEPT:

- A. Opsonize bacteria
- B. Be secreted into mucus
- C. Activate complement
- D. Cross the placenta

421. Those mutations that arise in the absence of known mutagen are known:

- A. Induced mutations
- B. Fused mutations
- C. Spontaneous mutations
- D. None of the above

422. DNA is copied during a process called:

- A. Transformation
- B. Replication
- C. Translation
- D. Transcription

423. An example/examples of a nonspecific chemical barrier to infection is/are:

- A. Unbroken skin
- B. Cilia in respiratory tract
- C. Lysozyme in saliva
- D. All of these

424. _____ is nonspecific host defense related to trachea?

- A. Lacrimation
- B. Ciliary Lining
- C. Desquamation
- D. Lactic acid

425. Autoclaving is done in:

- A. Dry air at 121°C and 15 lbs pressure
- B. Steam at 100°C for 30 minutes
- C. Steam at 121°C for 30 minutes
- D. Dry air at 160 °C for 30 minutes

426. Culture media are sterilized by:

- A. Autoclaving
- B. β -radiation
- C. Hot air oven
- D. Tyndallization

427. pH of Sabouraud dextrose agar is adjusted to:

- A. 1-2
- B. 4-6
- C. 6-8
- D. 8-10

428. Monocytes are _____ leukocytes that develop into _____?

- A. granular, phagocytes
- B. agranular, mast cells
- C. agranular, macrophages
- D. granular, T cells

429. Which of the following is a sterilizing agent?

- A. Dry heat
- B. Ether
- C. Ethanol
- D. Chlorohexidine

430. _____ is included in GALT.

- A. Thymus
- B. Tonsils
- C. Peyer's patches
- D. Breast lymph nodes

431. _____ is the MOST resistant to antiseptics?

- A. Spore
- B. Prion
- C. Cyst
- D. Fungus

432. Which of the following inflammatory signs specifies pain?
- Tumor
 - Calor
 - Dolor
 - Rubor
433. An example of an exogenous pyrogen is _____.
- Interleukin-1
 - Complement
 - Interferon
 - Endotoxin
434. _____ is an example of an inflammatory mediator that stimulates vasodilation.
- Collagen
 - Histamine
 - Complement C5a
 - Interferon
435. _____ is an example of an inflammatory mediator that stimulates chemotaxis.
- Tumor necrosis factor
 - Serotonin
 - Granulocyte-colony stimulating factor
 - Interleukin-2
436. _____ interferon, produced by T lymphocytes, activates cells called _____ and is involved in destroying viruses.
- Beta, lymphocytes
 - Gamma, fibroblasts
 - Alpha, natural killer cells
 - Beta, fibroblasts
437. Which of the following is the end-product of the complement system?
- Properdin
 - Cascade reaction
 - Membrane attack complex
 - Complement factor C9
438. TNF is NOT involved in the which process?
- Chemotaxis of phagocytes
 - Fever
 - The inflammatory response
 - The classic complement pathway
439. Which of the following statement is true?
- Solid media are enrichment media
 - Nutrient broth is basal media
 - Agar adds nutrient to media
 - Chocolate agar is selective media
440. Choose the correct ones for the decreasing order of resistance to sterilization:
- Prions, bacterial spores, bacteria
 - Bacterial spores, bacteria, Prions
 - Bacteria, Prions, Bacterial spores
 - Prions, bacteria, bacterial spores
441. A signaling molecule from microbes recognized by phagocytes is:
- Pyrogen
 - Pathogen Associated Molecular Patterns
 - Complement
 - Lectin
442. Which of the following microorganism is used as indicator in autoclave?
- Clostridium tetani*
 - Bacillus stearothermophilus*
 - Bacillus anthracis*
 - Clostridium botulinum*
443. MacConkey agar is an example of:
- Enrichment medium
 - Selective medium
 - Differential medium
 - Both "B" and "C"
444. Virus mediated transfer of DNA from one cell to another is known as:
- Transfection
 - Transduction
 - Transformation
 - Transcription
445. Bacteria may acquire characteristics by all of the following EXCEPT:
- Taking up soluble DNA from the environment
 - Through bacteriophages
 - Through conjugation
 - Incorporating part of host DNA
446. The _____ is responsible for antibiotic resistance in bacteria due to slime production.
- Co-aggregation
 - Biofilm formation
 - Mutation evolving in altered target site for antibiotic
 - Mutation evolving a target bypass mechanism
447. Which one statement is correct regarding functions of plasmid?
- Involved in multidrug resistance transfer
 - Imparts capsule formation
 - Imparts pili formation
 - All of these
448. Phage typing is useful as an epidemiological tool in all, EXCEPT:
- Salmonella*
 - Staphylococcus aureus*
 - Vibrio cholerae*
 - Shigella dysenteriae*
449. The segment of DNA between chromosomal and extrachromosomal DNA molecules within cells are:
- Cosmids
 - Plasmids
 - Transposons
 - Episomes
450. True about bacteriophage is:
- Can transmit toxin to bacteria
 - Bacterial which transmits DNA to another bacteria
 - Causes transformation of bacteria
 - Is a virus which invades bacteria
451. Drug resistance transfer by bacteriophage involves:
- Transformation
 - Conjugation
 - Convocation
 - Transduction

452. *S. aureus* differs from *S. epidermidis* by:
- Is coagulase positive
 - Forms white colonies
 - A common cause of UTI
 - Causes endocarditis of prosthetic valve
453. A cook prepared sandwiches for 10 people going for picnic. Eight out of them develop severe gastroenteritis within 4-6 hrs of consumption of the sandwiches. It is likely that on study the cook is found to be carrier of:
- Salmonella typhi*
 - Entamoeba histolytica*
 - Vibrio cholerae*
 - Staphylococcus aureus*
454. Methicillin resistance in *S. aureus* is due to:
- β -lactamase
 - MECA gene
 - AMPC gene
 - Porin develop
455. Acute hematogenous osteomyelitis is commonly caused by:
- S. aureus*
 - Streptococcus pneumoniae*
 - E. coli*
 - Pneumococcus
456. *Staphylococcus aureus* remains in the skin for longer period because of:
- Catalase
 - Coagulase
 - DNAase
 - Hyaluronidase
457. Eight months after prosthetic valve replacement, which of the following pathogen can cause infective endocarditis?
- Staphylococcus aureus*
 - Staphylococcus epidermidis*
 - Streptococcus viridans*
 - All of these
458. *Staphylococcus aureus* secretes all, EXCEPT:
- Lipase
 - Cellulose
 - Coagulase
 - Lecithinase
459. Lancefield grouping of streptococci is done using:
- M protein
 - Group C carbohydrate antigen
 - Group C peptidoglycan cell wall
 - M antigen
460. Streptococci causing dental caries:
- Streptococcus pyogenes*
 - Streptococcus mutans*
 - Streptococcus pneumoniae*
 - Streptococcus bovis*
461. Quelling phenomenon is seen in:
- Pneumococcus*
 - Streptococcus*
 - Staphylococcus*
 - Hemophilus*
462. A person from village is complaining of development of pustules. Extract from pus has shown Gram-positive cocci, showing hemolysis, catalase negative, identified as a group of streptococci. Following test is used:
- Bacitracin sensitivity
 - Novobiocin sensitivity
 - Optochin sensitivity
 - Hemolysis test
463. Hot cold phenomenon is seen due to which toxin of staphylococci:
- Alpha hemolysin
 - Beta hemolysin
 - Gamma hemolysin
 - Theta hemolysin
464. *Staphylococcus* differs from *Streptococcus* by:
- Coagulase test
 - Phosphatase test
 - Catalase test
 - Gram-negative
465. Which of the following statements is correct regarding non-coagulase Staphylococci?
- They are non-pathogenic
 - They commonly infect indwelling prosthesis
 - They may cause scarlet fever
 - They are separated by Gram's staining
466. Catalase positive, β -hemolytic Staphylococci is:
- S. aureus*
 - S. epidermidis*
 - S. saprophyticus*
 - Pneumococci
467. An infant with neonatal meningitis has a positive CAMP test, the causative agent is:
- Staphylococcus aureus*
 - Streptococcus agalactiae*
 - E. coli*
 - Hemophilus influenzae*
468. Most common organism responsible for post-splenectomy infections include:
- Streptococcus*
 - Staphylococcus*
 - Pseudomonas*
 - Influenza Virus
469. In a case of neonatal meningitis, pathogen was found to have properties of β -hemolysis, bacitracin resistance, CAMP positive. Which of following is most likely causative agent?
- Streptococcus pyogenes*
 - Streptococcus pneumoniae*
 - Streptococcus agalactiae*
 - Enterococcus faecalis*
470. A β -hemolytic bacterial isolate is resistant to vancomycin, shows growth in 6.5 % NaCl, is non-bile sensitive. It is likely to be:
- Streptococcus agalactiae*
 - Streptococcus pneumoniae*
 - Streptococcus bovis*
 - Enterococcus faecalis*

471. Sputum specimen of a 70 years old male culture showed α -hemolytic colonies on blood agar. Further processing of this organism is most likely to yield:
- Staphylococcus aureus*
 - Streptococcus pneumoniae*
 - Legionella*
 - Streptococcus pyogenes*
472. Most common organism causing sore throat:
- Staphylococcus*
 - Hemophilus*
 - Bacillus*
 - Streptococcus*
473. Quellung reaction is due to:
- Mitochondrial swelling
 - Capsular swelling
 - RBC swelling
 - Cell wall swelling
474. Griffith demonstrated biotransformation with:
- Enterococcus*
 - Gonococcus*
 - Pneumococcus*
 - Staphylococcus*
475. A person has received complete immunization against tetanus 10 years ago. Now he presents with a clean wound without any lacerations from an injury sustained 2.5 hours ago. He should now be given:
- Full course of tetanus toxoid
 - Single dose of tetanus toxoid
 - Human tetanus globulin
 - Human tetanus globulin and single dose of toxoid
476. All of the following bacteria are most often associated with acute neonatal meningitis EXCEPT:
- Escherichia coli*
 - Streptococcus agalactiae*
 - Neisseria meningitidis*
 - Listeria monocytogenes*
477. Which deficiency would cause *Neisseria* infection?
- C9
 - C5
 - C7
 - All of the above
478. Differentiation of *Neisseria gonorrhoeae* and *Neisseria meningitidis* is by:
- Glucose fermentation
 - VP reaction
 - Indole test
 - Maltose fermentation
479. _____ is catalase positive but coagulase negative.
- Streptococcus pyogenes*
 - Staphylococcus aureus*
 - Staphylococcus epidermidis*
 - Enterococci
480. A pus cultured on chocolate agar shows Gram-negative cocci, most likely organisms is:
- Hemophilus*
 - Streptococcus*
 - Staphylococcus*
 - Neisseria*
481. CSF in meningococcal meningitis shows:
- Gram-positive diplococci, in pus cells
 - Gram-negative diplococci, in pus cells
 - Gram-negative bacilli, in pus cells
 - Gram-positive bacilli, in pus cells
482. Regarding gas gangrene one of the following is correct:
- It is due to *Clostridium botulinum* infection.
 - Clostridia are Gram-negative anaerobes
 - Clinical features are due to protein endotoxin
 - Gas is invariably present in muscle compartments
483. Which of the following cause/s of Gas gangrene?
- Clostridium novyi*
 - Clostridium septicum*
 - Clostridium perfringens*
 - All of the above
484. Necrotizing gastrointestinal enteritis is caused by?
- Clostridium difficile*
 - Clostridium perfringens*
 - Clostridium tetani*
 - Clostridium botulinum*
485. Nagler's reaction is shown by:
- Clostridium septicum*
 - Clostridium botulinum*
 - Clostridium perfringens*
 - Clostridium tetani*
486. A 10-year-old boy following a road traffic accident presents to the casualty with contaminated wound over the left leg. He has received his complete primary immunization before preschool age and received a booster of DT at school entry age. All of the following can be done EXCEPT:
- Injection of tetanus toxoid
 - Broad spectrum antibiotics
 - Wound debridement and cleaning
 - Injection of human antiserum
487. What types of viruses contain the enzyme lysozyme to aid in their infection?
- Bacteriophage
 - Animal viruses
 - Plant viruses
 - Human viruses
488. All are correct regarding *Cl. tetani*, EXCEPT:
- Soil & intestine of human / animals are reservoirs
 - Predominantly seen in dry and winter season
 - Transmission through contaminated wounds
 - No herd immunity is seen
489. Viruses that can remain latent (usually in neurons) for many years are most likely:
- Togaviruses
 - Herpesviruses
 - Enteroviruses
 - Rhinoviruses
490. The most effective way of preventing tetanus is:
- Surgical debridement and toilet
 - hyperbaric oxygen
 - Antibiotics
 - Tetanus toxoid

491. An 18-year-old male presented with acute onset descending paralysis of 3 days duration. There is also a history of blurring of vision for the same duration. Both pupils are non-reactive. The most probable diagnosis is:
- Poliomyelitis
 - Botulism
 - Diphtheria
 - Porphyria
492. A patient of acute lymphocytic leukemia with fever and neutropenia develops diarrhea after amoxicillin therapy, which of the following organism is most likely to be the causative agent?
- Salmonella typhi*
 - Clostridium perfringens*
 - Clostridium difficile*
 - Shigella flexneri*
493. Swarming growth on culture is characteristic of which Gram-negative organism:
- Clostridium tetani*
 - Clostridium botulinum*
 - Bacillus cereus*
 - Proteus mirabilis*
494. Viruses range in size from
- 1-100 nm
 - 25-300 nm
 - 10-100 μm
 - 400-1000 nm
495. Structural component that is found in all viruses is:
- The envelope
 - DNA
 - Capsid
 - Spikes
496. Chemical component that is found in all viruses is:
- Protein
 - Lipid
 - DNA
 - RNA
497. A common polyhedral capsid shape of viruses is a:
- Pentagon
 - Cube
 - Icosahedron
 - Pyramid
498. Which of the following is the cause of smallpox?
- Varicella zoster
 - Variola virus
 - Vaccinia virus
 - Cowpox virus
499. The following are cell culture types EXCEPT:
- Semi-continuous
 - Primary
 - Continuous
 - Hemagglutination
500. Enteroviruses differ from rhinoviruses mainly by:
- Type of nucleic acid
 - Size
 - Capsid shape
 - Ability to survive in acidic conditions
501. A boy with skin ulcer on leg, culture revealed β -hemolysis. School physician said that similar hemolysis was seen in organism from sore throat, what is the similarity between both pathogens?
- Protein-A is same for both
 - C-carbohydrate antigen is different
 - C-carbohydrate antigen is the same
 - Strain causing both are same
502. A type of cell culture that can reproduce for an extended number of generations and is used to support viral replication is a:
- Primary cell culture
 - Continuous cell line
 - Secondary cell culture
 - Diploid fibroblast cell
503. Bacteriophages are readily counted by process of:
- Immunoassays
 - ELISA
 - Tissue culture
 - Plaque assays
504. Non-motile clostridium is:
- Clostridium perfringens*
 - Clostridium novyi*
 - Clostridium botulinum*
 - Clostridium difficile*
505. Which of the following is not an RNA virus?
- Retrovirus
 - Enterovirus
 - Rhabdovirus
 - Adenovirus
506. In name of family Reovirus, word 'reo' refers to:
- Respiratory enteric orphans
 - Respiratory
 - Enteric
 - Orphans
507. Virus that is well known in causing 'latent infection' is:
- Adenovirus
 - Hepatitis B Virus
 - Influenza virus
 - Herpesvirus
508. Which one of the following statements is NOT true about viral infections?
- Virus infections are all life threatening
 - number of viruses cause similar symptoms
 - Virus infection may cause immunosuppression
 - Some viruses require other viruses for replication
509. Which one of following viruses is not oncogenic?
- Adenoviruses
 - HSV-2
 - HCV
 - EBV
510. Laboratory diagnosis of HIV infection is usually made by which of the following:
- Biochemical tests
 - Growth of virus in chicken embryo
 - Detection of antigen and antibodies
 - Light microscopy

511. What is a primer?
- A short DNA sequence
 - A short RNA sequence
 - A short sequence of oligonucleotide
 - A promoter sequence
512. Direct viral diagnostic techniques include all of the following EXCEPT:
- Electron microscopy
 - Antibodies detection
 - Light microscopy
 - Viral genome detection
513. The first step in all virus infection is:
- Uncoating
 - Migration to nucleus
 - Attachment to cell receptor
 - Transcription
514. The first step in virus replication after uncoating of the positive-sense, single-stranded RNA viruses is which of the following?
- Transcription
 - Translation
 - Genome replication
 - Assembly
515. Rubella has the most serious consequences in:
- Children
 - Pregnant Women
 - Summer months
 - Years with heavy rainfall
516. Immunopathology (immune-mediated disease) may be involved with a severe form of which of the following *Flavivirus* infections?
- Yellow fever
 - West Nile
 - Hepatitis C
 - Dengue fever
517. Infectious bursal disease of chickens leads to loss of which of the following cell types?
- Thymic cells
 - B-lymphocytes
 - Neurons
 - Neutrophils
518. Deltavirus infection is always associated with coinfection with:
- Hepatitis C
 - Dengue fever
 - Hepatitis B
 - Influenza
519. Hemagglutination inhibition assay is used for detection of _____ in the sample.
- Antigen titer
 - Virus titer
 - Antibody titer
 - 4HA titer
520. Rabies virus reaches brain and salivary glands via:
- Blood
 - Lymph
 - SQ tissue
 - Nerves
521. An important paramyxovirus of poultry is:
- Infectious bursal disease virus
 - Newcastle disease virus
 - Avian influenza virus
 - Avian leukosis virus
522. Which of following produces life-threatening disease that can be well treated by fluid replacement?
- Mycoplasma pneumoniae*
 - Mycobacterium tuberculosis*
 - Treponema pallidum*
 - Vibrio cholerae*
523. Which of the following are trace elements?
- Potassium ion
 - Sodium ion
 - Copper ion
 - Magnesium ion
524. NDV is cultivated via _____ in embryonated Eggs.
- Allantoic inoculation
 - Yolk sac inoculation
 - Intra-cerebral inoculation
 - Chorioallantoic membrane inoculation
525. Viral diagnostic techniques include all EXCEPT:
- Electron microscopy
 - Antigen detection
 - Antibodies detection
 - Light microscopy
526. Transfection is insertion of DNA into _____ cells.
- Eukaryotic
 - Bacterial
 - Parasitic
 - Both "A" and "B"
527. In Gram-staining, iodine is used as a _____.
- Fixative
 - Mordant
 - Solublizer
 - Stain
528. Diagnosis of rabies is commonly done by _____.
- Direct Sandwich ELISA
 - Florescent Antibody Technique
 - Hemagglutination assay
 - Hemagglutination inhibition assay
529. In _____ vaccine, genetic material from a pathogen is inserted into a live carrier non-pathogen.
- Subunit
 - Acellular
 - Trojan horse
 - Live attenuated
530. 1% or 0.8% dilution of washed RBCs is prepared for use in HA assays by diluting washed RBCs in _____.
- Distilled H₂O
 - Double distilled H₂O
 - Double distilled deionized H₂O
 - Normal Saline
531. Lag phase is also known as _____.
- Period of initial adjustment
 - Transitional period
 - Generation time
 - Period of rapid growth

532. Cell culture that can reproduce for an extended number of generations and is used to support viral replication is:
- Primary cell culture
 - Secondary cell culture
 - Continuous cell culture
 - Diploid fibroblast cell culture
533. _____ is the causative agent of PLAGUE.
- Y. enterocolitica*
 - Y. pestis*
 - P. mirabilis*
 - E. coli*
534. Cells that use antibodies to recognize their targets:
- CD4+ T cells
 - CD8+ T cells
 - Macrophages
 - B lymphocytes
535. B-lymphocytes bind and respond to:
- Soluble antigens
 - Virus-infected host cell
 - Bacteria
 - Particulate matter
536. _____ complement pathway/s will activate first.
- Classical
 - Alternative
 - Lectin
 - All act simultaneously.
537. Sample of choice in Marek's disease is _____.
- Liver tissue
 - Feather follicle
 - Pieces of lymph node
 - Bursa of fabricius
538. In AGPT, precipitation band will appear if:
- Antigen antibody reaction is specific
 - Antigen is soluble
 - Conc. of antigen and antibody are optimum
 - All of the above
539. If LD_{50} is $10^{-5.6}$ using 100 μ l of sample, then what will be the virus titer.
- $10^{-4.6}$
 - $10^{-5.6}$
 - $10^{6.6}$
 - $10^{-6.6}$
540. Which one of following is CORRECT about T-cell?
- Has both MHC-I and MHC-II molecules.
 - Can kill infected host cells.
 - Does not require antigen processing/presentation
 - Differentiate into plasma cells
541. Stick method of virus inoculation is used for:
- Newcastle disease virus
 - Fowl pox virus
 - FMD virus
 - Avian influenza virus
542. A T-cell that has the CD8+ marker can be a:
- Cytotoxic T cell
 - Natural Killer T cell
 - Helper T cell
 - T Regulatory cell
543. Regarding MHC-I, which statement is FALSE?
- Ag. presented by MHC-I is recognized by CTL.
 - It typically processes antigens exogenously.
 - Peptide binding cleft is formed by α 1/ α 2.
 - It is present on all nucleated host cells.
544. Treatment with _____ is required for isolation of viruses from tissues; it precipitates _____ present in the sample.
- Formalin, lipids
 - Chloroform, lipids
 - Chloroform, proteins
 - Formalin, proteins
545. _____ is an example of suspension cell line?
- Vero cell line (Monkey Kidney cells)
 - Hela cell line (Human Cervix cells)
 - HEK 293 cell line (Human kidney cells)
 - YAC-1 cell line (Mouse Lymphoma cells)
546. Which one of the following is NOT the desired property for enzyme in ELISA?
- High turnover rate
 - Readily coupled to proteins
 - Resistant to high salt concentration
 - Cheap
547. Light chain DOES NOT originate from ____ region.
- Variable
 - Joining
 - Diversity
 - Constant
548. With respect to lymphocyte antigen receptors, which of the following statements is FALSE?
- The pool of lymphocytes can express several million different antigen receptors.
 - A single lymphocyte can express several thousand antigen receptors.
 - A single lymphocyte can only recognize a single antigenic epitope.
 - A single lymphocyte can express several thousand different antigen receptors.
549. Autoclave standards for decontamination of most microbiological materials is:
- 100°C at 15 psi for 10 minutes
 - 121°C at 15 psi for 10 minutes
 - 100°C at 10 psi for 60 minutes
 - 121°C at 15 psi for 60 minutes
550. Which is true for immunogenicity & antigenicity?
- An antigenic particle is always immunogenic, but the reverse is not true.
 - The terms are synonymous.
 - A particle that is immunogenic will trigger an adaptive immune response.
 - A particle that is antigenic will trigger an adaptive immune response.
551. Which one of the followings is INCORRECT for live vaccine?
- Require larger dose / more boosters
 - Require special storage (cold chain)
 - Can conceivably mutate back to virulent strain
 - Confer long-lasting protection

552. Endoflagellum is present in which class of bacteria?
- Spirilla
 - Spirochetes
 - Bacillus
 - Coccus
553. _____ provokes an overwhelming T-cell response.
- Autoantigen
 - Autoantigen
 - Allergen
 - Superantigen
554. Indirect protection of unimmunized animals is ____.
- Artificial active immunity
 - Herd immunity
 - Artificial passive immunity
 - Natural active immunity
555. Which of the following statements regarding clonal selection theory is INCORRECT?
- Specificity for Ag of T cells produced is identical to the specificity of the TCR on initial T cell.
 - The body is equipped with billions of lymphocytes. Each is devoted to respond to one specific epitope.
 - An epitope triggers the production of a number of lymphocytes, each with different receptors.
 - Antigen binding to a TCR triggers proliferation and differentiation of T cells into effector cells.
556. Which one of the following properties is NOT required for vaccine?
- Should protect against natural exposure
 - Should be cheaper.
 - Should have relatively longer shelf life.
 - Should be less immunogenic
557. In a host, virus-infected host cells are killed by:
- Activated cytotoxic T lymphocytes
 - Activated B lymphocytes
 - Activated T helper cells
 - Monoclonal antibodies
558. The Petroff-Hausser chamber is used for _____.
- Incubation of culture medium
 - Direct microscopic count
 - Viable count
 - To grow anaerobic bacteria
559. Toxoid injection to protect future tetanus infection is an example of:
- Natural passive immunity
 - Artificial active immunity
 - Natural active immunity
 - Artificial passive immunity
560. _____ has the ability induce a malignant tumor.
- Toxic
 - Carcinogenic
 - Corrosive
 - Ignitable
561. Secretory component that facilitates to move across the mucus membrane is present in:
- Ig M
 - Ig G
 - Ig A
 - Ig E
562. Biosafety level that includes most common laboratory microorganisms & involves organisms such as HBV, *Staphylococcus* & enteric pathogen is:
- BSL 1
 - BSL 2
 - BSL 3
 - BSL4
563. Which of the following open biological safety cabinets sterilize both the air entering and leaving the cabinet and utilizes a HEPA filter?
- Class I
 - Class II
 - Class III
 - Class IV
564. Which of the following hazardous chemicals causes serious biological effects following inhalation, ingestion or skin contact with even small amounts?
- Corrosive
 - Toxic
 - Carcinogenic
 - Ignitable
565. Bacterial fimbriae present on the outer cell surface are used for:
- Cellular activity
 - Sexual reproduction
 - Adherence to surfaces
 - Adherence and exchange of genetic information
566. An infection that may occur as a result of accidental needle sticks or through broken glass is classified as which of the following routes?
- Direct inoculation
 - Airborne
 - Ingestion
 - Mucous membrane contact
567. What is the total magnification if the eyepiece is 10X and the objective lens is 40X?
- 40 times bigger
 - 4 times bigger
 - 14 times bigger
 - 400 times bigger
568. _____ is intended to destroy all microorganism and their spores on inanimate surfaces?
- Disinfectant
 - Sterilizer
 - Antiseptic
 - Antibiotic
569. What part of the microscope is used to change the amount of light entering the stage?
- Eyepiece
 - Nosepiece
 - Diaphragm
 - Coarse adjustment knob
570. _____ is used for microorganism that have no known pathogenic potential like *Bacillus subtilis*.
- BSL-I
 - BSL-II
 - BSL-III
 - BSL-IV

571. Membrane filtration method has all the following advantages EXCEPT:
- More turbid samples can be processed easily.
 - Results are available in a shorter period of time.
 - Larger volumes of sample can be processed.
 - The results are readily reproducible.
572. _____ is used as chemical germicide used on skin.
- Disinfectant
 - Antiseptic
 - Sterilizer
 - Moist heat
573. _____ causes visible destruction or irreversible damage to human skin on contact.
- Toxic
 - Carcinogenic
 - Explosive
 - Corrosive
574. Any chemical that can burn and includes both combustible and flammable liquids is called _____.
- Corrosive
 - Toxic
 - Ignitable
 - Explosive
575. _____ are reactive and unstable substances that readily undergo violent chemical changes.
- Toxic
 - Corrosive
 - Explosive
 - Ignitable
576. What is the purpose of a biosafety cabinet in a microbiology laboratory?
- To sterilize materials, such as media and glassware
 - To provide a proper temp. for microbes to grow
 - To prevent sample from contamination
 - For long term storage of microbes at low temp.
577. What lab equipment is used to accurately measure the volume of liquids?
- Balance
 - Erlenmeyer flask
 - Ruler
 - Graduated cylinder
578. What lab equipment is used to measure the amount of matter in an object?
- Balance
 - Graduated cylinder
 - Thermometer
 - Autoclave
579. _____ is used to culture microbes at a specific temp.
- Incubator
 - Autoclave
 - Hot air oven
 - Desiccator
580. _____ is an example of indicator coliform bacterial species used to check quality of drinking water.
- Staphylococcus aureus*
 - Escherichia coli*
 - Salmonella typhimurium*
 - Mycobacterium tuberculosis*
581. _____ contains many different species in a sample.
- Broth culture
 - Pure culture
 - Mixed culture
 - Streak plate culture
582. _____ culture medium is supplemented with highly nutritious material such as serum.
- Differential medium
 - General purpose medium
 - Enrichment medium
 - Enriched medium
583. Crystal violet agar is an example of _____.
- General purpose medium
 - Enriched medium
 - Selective medium
 - Differential medium
584. In microbiology lab, mouth pipetting is done for:
- Dispensing liquid culture medium
 - Dispensing water to wash glass slide
 - To transfer bacterial culture to fresh medium
 - Strictly prohibited for any use
585. The temperature at which the rate of reproduction is most rapid is known as _____.
- Optimum growth temperature
 - Minimum growth temperature
 - Maximum growth temperature
 - None of the above
586. What will be CFU/ml if colonies per plate = 75, Dilution = 10^{-7} and volume added per plate 0.5ml.
- 1.5×10^7
 - 1.5×10^9
 - 1.5×10^8
 - 7.5×10^9
587. Oldest eukaryotic organisms are considered to be:
- Archaea
 - Diplomonads like Giardia
 - Fungi
 - Animals
588. MacConkey agar is an example of:
- Enriched medium
 - Selective medium
 - Differential medium
 - Both 'B' and 'C'
589. Petri dish/plate is commonly labeled:
- On the bottom-side of plate
 - On the top of plate
 - On the side of plate
 - On the inside of plate
590. Isolation of pure culture refers to _____.
- Purification of culture
 - Separation of a single colony
 - Introduction of inoculum
 - To grow microorganism on a surface
591. *Salmonella* from fecal sample is isolated using:
- Crowded-plate technique
 - Pour plate technique
 - Enrichment culture technique
 - Gradient-plate technique

592. _____ is best used for long term storage of microbial samples when carried out properly?
- storage in a freezer
 - storage in a refrigerator on an agar slant
 - storage on a petri plate at room temperature
 - storage in a freezer at ultra-low temperatures
593. Which of the following method is used for viable count of a culture?
- Plate-count method
 - Membrane-filter count
 - Plate-count method and membrane-filter count
 - Direct microscopic count
594. Soil microbes serially degrade nitrogenous organic compounds derived from dead plants and animals to converts them finally into NH_3 , the process is ____.
- Denitrification
 - Nitrogen fixation
 - Nitrification
 - Ammonification
595. The process of killing all microorganisms along with their spores is _____.
- Sterilization
 - Sanitization
 - Disinfection
 - Antisepsis
596. Antimicrobial activity of a NEW compound is checked against all the bacteria EXCEPT:
- Staphylococcus aureus*
 - Salmonella typhimurium*
 - Pseudomonas aeruginosa*
 - Escherichia coli*
597. _____ technique is used for isolation of antibiotic-producing microorganism from soil samples.
- Enrichment culture
 - Pour plate
 - Crowded-plate
 - Streak plate
598. All of followings are the sugars used in Triple sugar iron test to check their fermentation EXCEPT:
- Sucrose
 - Glucose
 - Lactose
 - Dextrose
599. Triple sugar iron test can be used for all EXCEPT:
- To differentiate b/w fermentation of lactose and sucrose
 - To observe H_2S production
 - To observe gas production from glucose fermentation
 - To differentiate b/w fermentation of glucose and lactose
600. Which of the following may account for the small size of the cells?
- The rate of diffusion
 - The surface area/volume ratio
 - The number of mRNAs that can be produced by the nucleus
 - All of the above
601. 20 grams of food sample are mixed with 180 ml of water. What will be the dilution?
- 10^{-2}
 - 10^{-1}
 - 10^{-3}
 - 10^{-4}
602. Which were the scientist lived at the same time?
- Koch and Pasteur
 - Darwin and Woese
 - Van Leeuwenhoek and Ricketts
 - Berg and Hooke
603. The feature of the archaea that distinguishes them from the bacteria is:
- Habitats which are extreme environments
 - Absence of a nuclear membrane
 - Presence of a cell wall
 - Cytoplasmic ribosomes that are 70S
604. Gram staining was introduced by:
- Christian Gram
 - Alfred Gram
 - Robert Cooke
 - Louis Pasteur
605. Which of the following is considered the most unifying concept in biology?
- Taxonomy
 - Anatomy
 - Genetics
 - Evolution
606. Various bacterial species can be subdivided into:
- Subspecies
 - Bio-varieties
 - Sero-varieties
 - All of these
607. A characteristic of protein synthesis in both the archaea and eukarya is:
- Transcription and translation are coupled
 - Translation is inhibited by diphtheria toxin
 - Proteins are synthesized from D-, rather than L-, isomers of amino acids
 - The initiator tRNA is charged with N-formyl-methionine
608. Which of the following show the maximum resistance to physical and chemical agents?
- Viruses
 - Mold spores
 - Bacterial spores
 - E. coli*
609. The virulence of _____ is linked to its cell wall, an exotoxin (PLD) and a protective antigen (CP40).
- Mycobacterium*
 - Campylobacter*
 - Brucella*
 - Corynebacterium*
610. *E. coli* O157:H7 is an example of:
- Enterotoxigenic *E. coli* (ETEC)
 - Enterohemorrhagic *E. coli* (EHEC)
 - Enteropathogenic *E. coli* (EPEC)
 - Enteroinvasive *E. coli* (EIEC)

- 611. Genetic and biochemical similarities between contemporary cyanobacteria and eukaryotic chloroplasts are accepted to mean that:**
- Eukaryotes evolved from bacteria
 - Eukaryotes evolved from archaea
 - Oxygenic photosynthesis first evolved in eukaryotes
 - Cyanobacteria arose from chloroplasts which escaped from plant cells
- 612. *Staph. aureus* differs from *S. epidermidis* by:**
- Is coagulase positive
 - Forms white colonies
 - A common cause of UTI
 - Causes endocarditis of prosthetic valve
- 613. A cook prepares snacks from 10 people going for a picnic. 08 out of them develop severe gastroenteritis within 4-6 hours of consumption of snacks. It is likely that on investigations cook is found to be carrier of:**
- Salmonella typhi*
 - Vibrio cholerae*
 - E. coli*
 - Staphylococcus aureus*
- 614. Ahmad comes from dinner, he complained about diarrhea, vomiting after 4 hours of meal. Most likely causative agent:**
- Salmonella typhi*
 - Vibrio cholerae*
 - E. coli*
 - Staphylococcus aureus*
- 615. _____ is capsulated and shows positive Negler's reaction due to presence of α -toxin.**
- Clostridium tetani*
 - Clostridium botulinum*
 - Clostridium perfringens*
 - Clostridium difficile*
- 616. Giemsa-stained blood smear with bipolar-staining pathogens indicates involvement of:**
- Bacillus anthracis*
 - Pasteurella multocida*
 - Brucella abortus*
 - Mycobacterium bovis*
- 617. Primary differences between cilia and flagella are:**
- Arrangement of microtubules
 - Length and location of basal bodies
 - Number, length and direction of force
 - How the microtubules are fused to each other?
- 618. All Gram-Negative bacilli have _____?**
- Capsule
 - Endotoxin
 - Exotoxin
 - Coagulase
- 619. Causative agent of lockjaw disease is hemolytic on blood agar due to the production of _____.**
- tetanolysin
 - tetanospasmin
 - endotoxin
 - beta-hemolysin
- 620. Which of the following is opportunistic pathogen?**
- Salmonella Typhimurium*
 - Escherichia coli*
 - Proteus mirabilis*
 - Yersinia pestis*
- 621. If result of TSI test show, Red/Yellow with bubbles and black precipitate, what is your interpretation?**
- Glucose fermentation and H₂S production
 - Lactose fermentation with gas and H₂S production
 - Glucose fermentation with gas and H₂S production
 - Glucose fermentation and H₂S production
- 622. Which one of these is extremely resistant to antibiotics and disinfectants?**
- Bacillus anthracis*
 - Pseudomonas aeruginosa*
 - Clostridium tetani*
 - Salmonella Typhimurium*
- 623. Which one of these is NOT correct about *B. mallei*?**
- B. mallei* can grow at 42°C
 - B. mallei* is non-motile
 - B. mallei* is non-hemolytic
 - B. mallei* can ferment glucose
- 624. *Brucella mallei* is classified as Category B bioterrorist agent because:**
- It causes chronic disease in equines
 - It presents as nasal, and cutaneous forms
 - Disease leads to formation of nodules on the skin
 - Infection by inhalation requires small number of pathogens
- 625. Infection with _____ can lead to abortion in pregnant women & can be life-threatening in neonates, elderly, and immunocompromised patients.**
- Clostridium tetani*
 - Klebsiella pneumoniae*
 - Listeria monocytogenes*
 - Mycoplasma mycoides*
- 626. Lumpy jaw disease with yellowish 'sulfur granules' is caused by:**
- Actinomyces bovis*
 - Borrelia anserina*
 - Actinobacillus lignieresii*
 - Mycoplasma bovis*
- 627. Which of the followings is NOT a predisposing factor for enterotoxaemia in elder sheep?**
- Incomplete establishment of normal microbiota
 - Abrupt change to a rich diet
 - Gorging on energy-rich diet
 - Intestinal hypomotility
- 628. _____ is used to determine glucose fermentation.**
- Voges Proskauer test
 - TSI test
 - Catalase test
 - Coagulase test
- 629. Zoonotic cases of TB are usually associated with?**
- Mycobacterium bovis*
 - Mycobacterium tuberculosis*
 - Mycobacterium avium*
 - Mycobacterium caprae*

630. Causative agent of bovine reproductive disease is?
 A. *Campylobacter fetus* subsp. fetus
 B. *Campylobacter fetus* subsp. venerealis
 C. *Campylobacter coli*
 D. *Campylobacter jejuni*
631. All are correct for anthrax bacilli EXCEPT?
 A. They produce endotoxin.
 B. They are spore forming.
 C. They have polypeptide capsule.
 D. They produce non-hemolytic colonies.
632. Shiga toxin is a form of?
 A. Exotoxin
 B. Endotoxin
 C. Neurotoxin
 D. Exfoliative toxin
633. Which of the following drug is NOT used to treat dermatophytosis (fungal disease) in cats and dogs?
 A. Itraconazole
 B. Ciprofloxacin
 C. Fluconazole
 D. Terbinafine
634. Which of the following is NOT the characteristic of all members of *Enterobacteriaceae*?
 A. Motile
 B. Gram-negative
 C. Catalase positive
 D. Facultative anaerobes
635. *Borrelia burgdorferi* is transmitted by:
 A. Ixodes
 B. *Aedes*
 C. *Anapholes*
 D. *Argus*
636. Addition of glycerol in the culture medium enhances the growth of:
 A. *Mycobacterium tuberculosis*
 B. *Mycobacterium avium*
 C. *Mycobacterium bovis*
 D. Both 'A' & 'B'
637. Which causes food INTOXICATION?
 A. *Clostridium botulinum*
 B. *Clostridium tetani*
 C. *Streptococcus pyogenes*
 D. *Salmonella Typhimurium*
638. Colonies of _____ give egg-fried appearance.
 A. *Klebsiella pneumoniae*
 B. *Bacillus anthracis*
 C. *Mycobacterium bovis*
 D. *Mycoplasma bovis*
639. Fowl typhoid is caused by:
 A. *Salmonella Typhimurium*
 B. *Salmonella Pullorum*
 C. *Salmonella Gallinarum*
 D. *Salmonella Enteritidis*
640. _____ is a property of *Listeria monocytogenes*:
 A. It is an extracellular pathogen
 B. It can grow at refrigerator temperatures (4°C)
 C. It is non-motile
 D. After Gram-staining, it exhibits G+ large bacilli
641. Dermatophytosis in human is caused by _____ contracted from infected cats.
 A. *Microsporum capri*
 B. *Trychophyton canis*
 C. *Microsporum canis*
 D. *Epidermyphyton canis*
642. Which of the following is NOT a SEROLOGICAL test used for diagnosis of bovine brucellosis?
 A. Rose-Bengal plate test
 B. Polymerase chain reaction
 C. Brucella milk ring test
 D. Complement fixation test
643. Wooden tongue or timber tongue with history of grazing rough pasture indicates the infection by:
 A. *Borrelia anserina*
 B. *Actinomyces bovis*
 C. *Actinobacillus lignieresii*
 D. *Mycoplasma bovis*
644. Fungi can cause disease by:
 A. Tissue invasion
 B. Toxin production
 C. Induction of hypersensitivity
 D. All of these
645. Virulence factor/s of *C. neoformans* include?
 A. Capsule
 B. Ability to grow at mammalian body temp.
 C. Production of phenol oxidase
 D. All of these
646. All are bounded by a cell wall EXCEPT:
 A. *Actinomyces bovis*
 B. *Mycobacterium bovis*
 C. *Mycoplasma bovis*
 D. *Borrelia anserina*
647. Gas gangrene causing bacillus is:
 A. Facultative anaerobe
 B. Microaerophilic
 C. Obligate anaerobe
 D. Obligate aerobe
648. *Leptospira* is transmitted (animal to human) by?
 A. Animal scratch
 B. Contact with urine from infected animal
 C. Animal bite
 D. Arthropod vector
649. Zearalenone (mycotoxin) is produced by:
 A. *Aspergillus* species
 B. *Fusarium* species
 C. *Penicillium* species
 D. *Claviceps* species
650. Example of anaerobic medium is
 A. Robertson cooked-meat medium
 B. Sabouraud dextrose agar
 C. MacConkey agar
 D. Mannitol salt agar
651. MacConkey agar is an example of?
 A. General purpose medium
 B. Enrichment medium
 C. Differential medium
 D. Enriched medium

652. Which of the following is the most commonly affected non-pulmonary site by *Mycoplasma*?
- Meningitis
 - Prosthetic heart valve
 - Septic arthritis
 - Urethritis
653. Which of the following is the current preferred antimicrobial treatment of cutaneous anthrax?
- Aminoglycosides
 - Ciprofloxacin
 - Penicillin
 - Tetracycline
654. *Bacillus anthracis* is unique to other bacteria. It is the only bacteria to possess which of the following?
- An endotoxin
 - A polypeptide capsule
 - A polysaccharide capsule
 - Teichoic acid in its outer cell wall
655. Which of the following diseases could also be transmitted by ticks?
- Q fever
 - Leptospirosis
 - Ehrlichiosis
 - Yellow fever
656. Which of the following are the special laboratory conditions needed to recover *C. jejuni*?
- 98.6 °F (37 °C) aerobic blood agar plates
 - 98.6 °F (37 °C) anaerobic blood agar plates
 - 107.6 °F (42 °C) microaerophilic Skirrow medium
 - 107.6 °F (42 °C) anaerobic Skirrow medium
657. Testing of blood culture revealed Gram-positive cocci, vancomycin-resistant, PYR-positive and the presence of Lancefield group D antigen. Which of the following is the most likely isolate identification?
- Enterococcus faecalis*
 - Staphylococcus aureus*
 - Streptococcus pneumoniae*
 - Streptococcus agalactiae*
658. Verotoxin producing *E. coli* O157:H7 serotype belongs to which group?
- Enteroaggregative *E. coli* (EAEC)
 - Enterhemorrhagic *E. coli* (EHEC)
 - Enteroinvasive *E. coli* (EIEC)
 - Enterotocigenic *E. coli* (ETEC)
659. Which of the following is a key typical characteristic of *H. pylori* as compared to *Campylobacter* species?
- Coagulase production
 - Catalase production
 - Urease production
 - Curved shape
660. A 4-year-old has fever and diarrhea. Blood culture grows a Gram-negative rod. This is most likely to be which of the following?
- Group B *Streptococcus*
 - Listeria* species
 - Salmonella* species
 - Neisseria* species
661. The O antigen used to help characterize members of *Enterobacteriaceae* are found on:
- Capsules
 - Endotoxins
 - Exotoxins
 - Flagella
662. The most frequent source of *L. monocytogenes* infection is through which of the following?
- Human feces
 - Soil
 - Raw milk
 - Ticks
663. The ability of the *Neisseria meningitidis* to colonize the respiratory mucosa is associated with its ability to synthesize:
- Coagulase
 - Collagenase
 - Lipases
 - Pilli
664. UTI as a result of *Proteus mirabilis* facilitates the formation of kidney stones because the organism does which of the following?
- Destroys blood vessels in the kidney
 - Exhibits 'swarming' motility
 - Ferments many sugars
 - Produces a potent urease
665. A woman is noted to have pyelonephritis with shaking chills and fever. Blood cultures are obtained and the Gram-negative is read preliminary as consistent with *Proteus* species. Which of the following bacteria also may be the etiology?
- Escherichia coli*
 - Group B *Streptococcus*
 - Staphylococcus aureus*
 - Streptococcus pyogenes*
666. A man is diagnosed with meningitis. CSF grows out Gram-positive diplococci. This is most likely to be:
- Neisseria meningitidis*
 - Staphylococcus aureus*
 - Salmonella typhi*
 - Streptococcus pneumoniae*
667. Which of the following viral families is known to be causally associated with tumor formation?
- Flavivirus
 - Papovavirus
 - Paramyxovirus
 - Polyoma virus
668. In which of the following sites is *Salmonella typhi* most likely to be found during the carrier state?
- Blood
 - Gallbladder
 - Kidney
 - Lungs
669. Which of the following is mismatched?
- Halophilic – *Salmonella typhi*
 - Severe dehydration – *Vibrio cholerae*
 - Multi-drug resistance – *Pseudomonas aeruginosa*
 - Coagulase positive – *Staphylococcus aureus*

670. A 12-hour-old newborn has a temperature of 103°F. Blood culture grows Gram-positive cocci in chains. This is most likely to be:
- Group A *Streptococcus* (*S. pyogenes*)
 - Staphylococcus aureus*
 - Neisseria meningitidis*
 - Mycobacterium tuberculosis*
671. _____ is primary factor of *S. pneumoniae*?
- Pilli
 - Polypeptide capsule
 - Polysaccharide capsule
 - Coagulase
672. Virulence factors of *Staphylococcus aureus* include all of the following EXCEPT:
- Coagulase
 - Enterotoxin
 - Protein A
 - M protein
673. Short incubation food poisoning caused by ingestion of preformed enterotoxin, is caused by:
- Staphylococcus aureus*
 - Staphylococcus epidermidis*
 - Staphylococcus saprophyticus*
 - Streptococcus pneumoniae*
674. A nurse experienced a needle stick injury. The patient used illicit intravenous drugs. One month later, nurse develops jaundice. Which of following findings would implicate hepatitis B as the etiology?
- Positive anti-hepatitis B surface antibody
 - Positive anti-hepatitis B-core antibody
 - Positive hepatitis B surface antigen
 - Positive anti-hepatitis A antibody
675. A man tests positive for HCV infection. Which of following is the most likely method of transmission?
- Fecal-oral
 - Fomite
 - Intravenous drug (needles)
 - Sexual transmission
676. In an HIV-1 patient, which of following is the most predictive of the patient's prognosis?
- Degree of lymphadenopathy
 - CD4+:CD8+ cell ratio
 - Level of HIV-1 RNA in plasma
 - Rate of decline in anti-HIV antibody
677. Which of the following is the pathogen responsible for blindness in advanced HIV infection?
- Cytomegalovirus*
 - Candida albicans*
 - Mycobacterium tuberculosis*
 - Neisseria meningitidis*
678. A second-year MPhil student is researching the role of HPV in causing cancer. Which of the following types of cancer is HPV most commonly associated with?
- Anogenital
 - Breast
 - Lung
 - Prostate
679. The primary pathologic effect of polio viral infection is a result of which of the following?
- Destruction of infected cells
 - Persistent viremia
 - Immune complex formation
 - Aseptic meningitis
680. Which of the following statements best describes an advantage of the oral polio vaccine when compared to inactivated polio vaccine?
- It can be given to immunocompromised patients.
 - It is not associated with vaccine-related cases of poliomyelitis.
 - It induces local intestinal immunity.
 - It is easily administered as a series of multiple injections.
681. Which of the following paramyxoviruses lacks an envelope viral attachment protein with HA activity?
- Parainfluenza virus
 - Mumps virus
 - Measles virus
 - Respiratory syncytial virus
682. *Escherichia coli* differs from *Klebsiella* by:
- Gram- negative
 - Motile
 - Non- sporogenous
 - Non lactose fermenting
683. Which of the following morphological structures is not associated with *Candida albicans*?
- Yeast
 - Hyphae
 - Pseudohyphae
 - Sporangium
684. A definitive diagnosis of ascariasis can be made by observing which of the following?
- An eosinophilia in a differential WBC count
 - Motile larvae in a stool sample
 - Larvae in radiography of lungs
 - An adult worm passed during a bowl movement
685. Polymyxin inhibits the growth of the microbes by carrying out which of the following actions?
- Inhibition of cell-wall synthesis
 - Damage to cytoplasmic membrane
 - Inhibition of nucleic acid and protein synthesis
 - Inhibition of specific enzyme systems
686. An immunocompromised woman is diagnosed as having meningitis. A latex agglutination test on the CSF for capsular polysaccharide antigen is positive. Which of the following is the most likely the cause?
- Aspergillus fumigatus*
 - Cryptococcus neoformans*
 - Toxoplasma gondii*
 - Nocardia asteroides*
687. Ascariasis is most effectively treated with which of the following drugs?
- Mebendazole
 - Metronidazole
 - Penicillin
 - Niclosamide

688. A woman has chronic diarrhea. Identification of which of the following stages of the organism would provide evidence for cryptosporidiosis?
- Cyst
 - Oocyst
 - Merozoites
 - Egg
689. Which of the following is a host in the life cycle of all trematodes that infect humans?
- Flea
 - Mosquito
 - Snail
 - Sand fly
690. If 35 colonies were counted on a 10^{-2} dilution plate inoculated with a loop calibrated to deliver 0.01 ml of urine, what will be the bacteria/ml in the urine?
- 35,000
 - 350,000
 - 3,500
 - 350
691. What will be your result interpretation, if MPN results shows 0,1,3 after presumptive test?
- Water is potable
 - Error in collecting water sample
 - Dilution of media is incorrect
 - Water is not polluted with *E. coli*
692. Ability to ferment ____ is used to detect coliforms?
- Lactose
 - Glucose
 - Mannitol
 - Dextrose
693. Ames test general requires addition of ____ to make bacterial system comparable to mammalian system.
- Liver homogenate
 - Kidney homogenate
 - Spleen homogenate
 - Blood homogenate
694. Acid fastness of tubercle bacilli is attributed to:
- Presence of mycolic acid
 - Integrity of cell wall
 - Both of above
 - Cell Membrane
695. The majority of non-immunized patients infected with poliovirus would be expected to experience which of the following symptoms?
- Flaccid paralysis of ≥ 1 extremities
 - Aseptic meningitis
 - Muscle spasms and pain
 - Asymptomatic infection
696. ____ protect pneumococci against phagocytosis.
- Haemolysin
 - Hyaluronidase
 - Necrotizing toxin
 - Capsular polysaccharides
697. Routine sugar bacterial culture medium contain:
- 2 % sugar
 - 0.5 - 1 % sugar
 - 0.1 – 0.5 % sugar
 - <0.1 % sugar
698. Antigen becomes more potent because of:
- Increased number of epitopes
 - Larger antigen determinants
 - Repetitive occurrence of antigenic determinants
 - None of the above
699. Fungus is cultured on:
- Nutrient broth
 - Nutrient agar
 - MaConkey medium
 - Sabouraud agar
700. After overnight incubation, the lowest concentration of the drug that restricts the growth of bacterium inoculated is called:
- Minimum inhibitory concentration (MIC)
 - Minimum bacterial concentration (MBC)
 - Lf dose
 - LD50
701. The commonest infectious viral disease of man is:
- Rabies
 - Chicken pox
 - Measles
 - Common cold
702. Chemical contaminants in water can lead to teratogenicity, which can be defined as:
- Ability to cause abortion in pregnant women
 - Ability to cause heritable changes in DNA
 - Ability to cause cancerous growth
 - Ability to cause abnormalities in developing fetus
703. The therapy for genetic disorders which is aimed at mutant gene, to replace it with normal function gene by use of DNA/RNA tumor viruses is known as:
- Active Immunotherapy
 - Genetic counseling
 - Gene therapy
 - Interferon therapy
704. Intracytoplasmic inclusion bodies are seen for:
- Echovirus
 - Rabies virus
 - Cytomegalovirus
 - Influenza virus
705. Transformation is defined as:
- Transfer of DNA into bacterium
 - Infection of bacterium with phage
 - Transfer of phage from one bacterium to another
 - Transfer of DNA to mammalian cell
706. The total number of viable bacteria present in a sample is better determined by:
- Direct microscopic count
 - Colony count or pore plate method
 - Photometric measurement of turbidity
 - Agglutination with specific antiserum
707. The organisms which are devoid of their own metabolic system and obtain energy from the host cell are called:
- Autotrophs
 - Hypotrophs
 - Heterotrophs
 - L-forms

708. Which of the following antibiotic dose not act on cell membrane?

- A. Colistin
- B. Polymyxin
- C. Nystatin
- D. Chloromycetin

709. 'Epitopes' is the:

- A. Effective number of reacting sites on the antigen
- B. Precipitate formed when both antigen and antibody react in appropriate proportions
- C. Distinct combining sites on the surface of a given antigen which is responsible for the specificity of the immune response
- D. Three dimensional lattice structures formed by antigen antibody reaction

710. Number of domains in IgM is:

- A. Four
- B. Tow
- C. One
- D. Five

711. The immunoglobulin which can cross placenta is:

- A. IgG
- B. IgM
- C. IgA
- D. IgD

712. 1 definite host and 2 intermediate hosts are seen in:

- A. *Schistosoma haematobium*
- B. *Diphyllobothrium latum*
- C. *Echinococcus*
- D. *Ascariasis*

713. Which of the following can be prevented by filtering water?

- A. Tapeworm
- B. Roudworm
- C. Pinworm
- D. Guineaworm

714. Cutaneous larva migrant is caused by:

- A. *Ankylostoma braziliensis*
- B. *Ankylostoma duodenale*
- C. *Toxocara canis*
- D. *Toxoplasma gondii*

715. Which of the following crosses placenta?

- A. Malarial parasite
- B. Tuberculosis
- C. Toxoplasmosis
- D. Amoebiasis

716. The best route of administering Anti-lymphocytic globulin is:

- A. Oral
- B. S/C
- C. I/M
- D. I/V

717. All of the following human interferons are mainly induced by viral infections except:

- A. Alpha
- B. Beta
- C. Gamma
- D. Delta

718. Killed vaccines are characterized by all of the following EXCEPT:

- A. Less immunogenic
- B. Protection lasts for a short period
- C. Repeated doses (booster) required
- D. Are given by injection only

719. The correct match is:

- A. Small pox : Guarnieri bodies
- B. *Streptococcus* : Coagulase test
- C. *Corynebacterium* : Paul Bunnell test
- D. *Vibrio* : Schick test

720. The following penicillins are penicillinase resistant EXCEPT:

- A. Methicillin
- B. Ampicillin
- C. Oxacillin
- D. Cloxacillin

721. Carbol fuchsin (used for Zeihl Neelsen staining) consists of all the following EXCEPT:

- A. Basic fuchsin
- B. Absolute alcohol
- C. Formaldehyde
- D. Aqueous phenol

722. "Step-wise" mutation for drug resistance is seen with:

- A. Penicillin
- B. Streptomycin
- C. Garamycin
- D. Kanamycin.

723. Blood groups were first discovered by:

- A. Landsteiner
- B. Richet
- C. Metchnikoff
- D. Jenner

724. Which of the following, regarding acid-fastness of the two Mycobacteria is true?

- A. *Mycobacterium tuberculosis* is more acid-fast than *Mycobacterium leprae*
- B. *Mycobacterium leprae* is more acid-fast than *Mycobacterium tuberculosis*
- C. Both are equally acid-fast
- D. Both are acid-fast but not acid-alcohol-fast

725. Bacterial resistance to antibiotics is transmitted by:

- A. Transduction
- B. Transformation
- C. Mutation
- D. Plasmids

726. Ramsay Hunt Syndrome is caused by:

- A. Virus
- B. Bacteria
- C. Chlamydia
- D. Fungus

727. Which of the following virus has double stranded RNA?

- A. Hepatitis A
- B. Hepatitis B
- C. Polio
- D. Reovirus

728. In electron microscope, wavelength of electrons is:

- A. 0.005 nm
- B. 0.005 μ
- C. 0.5 μ
- D. 0.05 nm

729. Gram positive bacteria are characterized by all of the following EXCEPT:

- A. Thicker
- B. Absent lipids
- C. Absent Teichoic acid
- D. Absence of aromatic amino acids

730. Organelles with hydrolytic enzymes are:

- A. Mitochondria
- B. Lysosomes
- C. Golgi bodies
- D. Ribosomes

731. Mesosomes are:

- A. A kind of Ribosome
- B. A part of cell wall
- C. Formed during cell lysis
- D. Principle sites of respiratory enzymes

732. BSE was first reported from:

- A. France
- B. Canada
- C. United Kingdom
- D. Pakistan

733. COFAL test is used for the diagnosis of:

- A. Equine infectious anemia
- B. AIDS
- C. Avian leukosis
- D. Bovine leukosis

734. The following retroviruses produce tumors, EXCEPT:

- A. Caprine arthritis encephalitis virus
- B. Bovine leukemia virus
- C. Avian leukosis virus
- D. Feline leukemia virus

735. Predilection site for parvovirus is

- A. Bone marrow
- B. Enteric epithelium
- C. Fetus
- D. All the above

736. Following Immunoglobulin classes manifest antiviral activity except:

- A. Ig M
- B. Ig G
- C. Ig A
- D. Ig E and Ig D

737. Term vaccine was coined by:

- A. Robert Koch
- B. Louis Pasteur
- C. Needham
- D. F. Redi

738. The following bacteria have a single curve:

- A. *Borrelia*
- B. *Vibrio*
- C. *Treponema*
- D. *Pasteurella*

739. Albert's stain (used for metachromatic granules staining) consists of all of the following except:

- A. Toluidine blue
- B. Carbol fuchsin
- C. Malachite green
- D. Acetic acid

740. The cell wall of bacteria can be visualized by all of the following EXCEPT:

- A. Azure II staining
- B. Silver impregnation technique
- C. Ultraviolet microscopy
- D. Electron microscopy

741. Gram positive bacteria are more susceptible to all of the following EXCEPT:

- A. Sulfas and penicillin
- B. Basic dyes
- C. Anionic detergents
- D. None of the above

742. Which of the following is not absent in prokaryotes?

- A. Mitochondria
- B. Nucleolus
- C. Muramic acid
- D. Sterols

743. Genotypic variations are not:

- A. Stable
- B. Heritable
- C. Influenced by environment
- D. Not influenced by environment

744. The fungi which do not a sexual stage are called:

- A. Phycomycetes
- B. Ascomycetes
- C. Basidiomycetes
- D. Fungi imperfecti

745. The counter stain used in Zeihl Nielsen staining is:

- A. Carbol fuchsin
- B. Gentian violet
- C. Gram's iodine
- D. Loeffler's methylene blue

746. Hepatitis A virus is:

- A. Double stranded DNA
- B. Single stranded DNA
- C. Double stranded RNA
- D. Single stranded RNA

747. *Staphylococcus* bacteria are:

- A. Chemosynthetic autotrophs
- B. Photosynthetic autotrophs
- C. Chemosynthetic heterotrophs
- D. Photosynthetic heterotrophs

748. Viruses come under the category:

- A. Autotrophs
- B. Hypotrophs
- C. Heterotrophs
- D. L-forms

749. Rhinovirus has:

- A. Double stranded DNA
- B. Single stranded DNA
- C. Double stranded RNA
- D. Single stranded RNA

750. _____ form of water is the most contaminated.

- A. Underground water
- B. Rainwater
- C. Surface water
- D. Water stored in ice caps

751. Rubber catheters are best sterilized by:

- A. Formalin vapor
- B. Glutaraldehyde
- C. Gamma radiation
- D. Autoclaving

752. Which of the following is highly sensitive to heat?

- A. *Staphylococcus*
- B. *Pseudomonas*
- C. Clostridia
- D. Treponema

753. Soiled dressings are destroyed by:

- A. Hot air oven
- B. Autoclaving
- C. Boiling
- D. Incineration

754. Spores of which of the following are used as a microbiological test of dry heat efficiency:

- A. Toxigenic strains of *E. coli*
- B. Toxigenic strains of *Clostridium tetani*
- C. Non-toxigenic strains of *Clostridium tetani*
- D. Non-toxigenic strains of *Proteus*

755. The following is the direct stain for capsule:

- A. Fleming's Nigrosin method
- B. Dry India ink film method
- C. Welch method
- D. Both "A" and "B"

756. The major mechanism of the lethal effect of UV light on bacteria is attributed to its effect on:

- A. Ribosome
- B. Lysosome
- C. Mesosome
- D. DNA

757. Koch's old tuberculin is preserved in:

- A. 70% formalin
- B. 50% glycerine
- C. 2% phenol
- D. Absolute alcohol

758. "Turbidity test" for milk is used to detect its:

- A. Pasteurization
- B. Sterilization
- C. Contamination
- D. *Lactobacillus* contents

759. Microorganisms can be phagocytosed after

- A. Opsonization
- B. Hydrolysis
- C. Cytolysis
- D. Ingestion

760. The colors of acid fast and non-acid fast bacteria are respectively:

- A. Blue, red
- B. Red, blue
- C. Red, black
- D. Black, purple

761. In Albert's staining, the volutin granules are stained _____ against a _____ background:

- A. Bluish black, green
- B. Pink, green
- C. Green, black
- D. Bluish, purple

762. _____ %age of ethanol is used for disinfection.

- A. 30
- B. 70
- C. 80
- D. 90

763. Most effective practical way of sterilization is:

- A. Boiling
- B. Autoclaving
- C. Alpha rays
- D. Gamma rays

764. Due to acidic nature of their protoplasm, bacteria have affinity for:

- A. Basic dyes
- B. Acidic dyes
- C. Neutral dyes
- D. All of the above

765. _____ does not stimulate phagocytes.

- A. Cytokines
- B. C3b
- C. Histamine
- D. γ -IFN

766. Immunogenicity of an antigen is related with

- A. Foreignness
- B. Chemical nature
- C. Immune response
- D. None of these

767. Helper T cell does not activate

- A. B-cells
- B. Macrophages
- C. T-cytotoxic cells
- D. Mast cells

768. _____ is NOT sign of inflammation?

- A. Sweating
- B. Pain
- C. Swelling
- D. Redness

769. Natural transfer of Igs from mother to fetus is

- A. Active immunity
- B. Passive immunity
- C. Non-specific
- D. Artificial immunity

770. The most common antibody in the serum is

- A. IgA
- B. IgD
- C. IgM
- D. IgG

771. Which of the following is NOT involved in non-specific defense?

- A. Lacrimal apparatus
- B. Sweat gland
- C. Mucus
- D. IgM

772. According to clonal deletion theory, self-reacting lymphoid cells become

- A. Normal
- B. Destroyed
- C. Amplified
- D. Activated

773. Which one of the following is not related to Hypersensitivity Type I?

- A. Histamine
- B. Prostaglandins
- C. Perforins
- D. Leukotrienes

774. _____ is NOT related with Antigens?

- A. Epitopes
- B. Globulins
- C. Hapten
- D. Lipoproteins

775. IgM antibodies has been found to occur in

- A. Pentamer
- B. Monomer
- C. Dimer
- D. All forms

776. Autoimmunity develops due to

- A. Immunological tolerance
- B. Self-tolerance
- C. Clonal deletion
- D. None of the above

777. Tetanus is caused by the spread of

- A. Exotoxin in sympathetic system
- B. Exotoxin in parasympathetic system
- C. Endotoxin in Sympathetic system
- D. Endotoxin in parasympathetic system

778. All of the following cause gas gangrene EXCEPT:

- A. *Clostridium botulinum*
- B. *Clostridium welchii*
- C. *Clostridium oedemaiens*
- D. *Clostridium septicum*

779. Following are anaerobic bacteria EXCEPT:

- A. *Nocardia asteroides*
- B. *Actinomyces bovis*
- C. *Clostridium tetani*
- D. None of the above

780. Spirocheates are motile by

- A. Flagella
- B. Cilia
- C. Pseudopodia
- D. all of above

781. Kauffman-White scheme is for classification of *Salmonella*?

- A. Biochemically
- B. Antigenically
- C. Chemotyping
- D. Phage typing

782. All of the following produce hemolysin EXCEPT:

- A. *Clostridium tetani*
- B. *Streptococcus hemolyticus*
- C. *Staphylococcus aureus*
- D. *E. coli*

783. The following are characteristics of *Pseudomonas aeruginosa* EXCEPT:

- A. Produce pigment
- B. Obligate anaerobe
- C. Produce local suppurative lesions
- D. Spore forming and capsulated

784. The following antibodies CANNOT cross placenta EXCEPT:

- A. IgA
- B. IgD
- C. IgM
- D. IgG

785. All of the following are true about interferons EXCEPT:

- A. Virus specific
- B. Antiviral
- C. Host cell specific
- D. Class of proteins

786. The following statements regarding varicella and zoster are true EXCEPT ONE:

- A. They are two diseases caused by one virus
- B. Varicella is the primary illness, whereas zoster is the recurrent form of the disease
- C. They have the same clinical picture
- D. Varicella can be prevented by vaccination

787. The following statements about herpesviruses are true EXCEPT ONE:

- A. There are eight human herpes viruses
- B. All are morphologically identical
- C. All are DNA-viruses
- D. All cause vesicular rash

788. Chlamydia have the following properties EXCEPT:

- A. Possess cell wall
- B. Possess DNA as well as RNA
- C. Are susceptible to antibiotics
- D. Are not filterable

789. Regarding viral pathogenesis, which is WRONG:

- A. Spread of virus in the body through different route
- B. Humoral immunity but not cell mediated immunity (CMI) act against viruses
- C. In cytotoxic infection, cell usually die
- D. Several RNA viruses can cause persistent infection

790. The following diseases are caused by enteroviruses EXCEPT ONE:

- A. Pleurodynea
- B. Glomerulonephritis
- C. Paralysis
- D. Meningitis

791. Spirocheates are

- A. Gram positive rods
- B. Gram negative rods
- C. Gram negative cocci
- D. Acid Fast rods

792. Lyme disease is transmitted by

- A. Flea
- B. Ticks
- C. *Aedes*
- D. *Culex*

793. For virus, choose the WRONG STATEMENT:

- A. The viral envelope contains lipoprotein
- B. Viruses can replicate in non-living media
- C. Viruses need live cells to grow
- D. Viruses have no ribosome

794. Regarding Poliovirus, the WRONG statement is:

- A. Two vaccine are available
- B. There is no vaccine for polio
- C. Can be isolated from throat swab or stool
- D. Sub-clinical infections are common

795. In structure and classification of viruses, circle the WRONG STATEMENT:

- A. Icosahedral symmetry has 12 vertices
- B. Helical symmetry such as Othomyxo virus
- C. Transcription is the formation of protein
- D. Translation is the formation of protein

796. Regarding HCV & HBV, circle the correct answer:

- A. HBV is dsRNA
- B. HCV is ssRNA
- C. Both viruses can grow in cell culture
- D. HBV has not chronicity complication

797. Regarding viral hepatitis, circle the WRONG:

- A. HCV-Abs can't be diagnosed in lab by EIA test
- B. The risk factor for hepatocellular carcinoma by HCV are: underlying liver disease, alcohol, age
- C. HCV-DNA integrate into liver cell chromosomes in most HCC patients.
- D. The RNA and protein of HDV is surrounded by HBsAg

798. An abortive infection is one in which:

- A. The infected cells are killed
- B. Progeny virus is not produced
- C. Transplacental infection of the fetus occurs
- D. Cell multiplication is stopped

799. The human diploid cell vaccine is used for prevention of:

- A. Rabies
- B. Varicella
- C. Hepatitis A
- D. Yellow fever

800. The following viral diseases are characterized by maculopapular rash EXCEPT ONE:

- A. Measles
- B. Rubella
- C. Erythema
- D. Herpangina

801. All of the following are true about cytokines EXCEPT:

- A. Communicators
- B. Interleukine-I
- C. TNF
- D. Perforin

802. The following viruses are associated with congenital infection EXCEPT ONE:

- A. Rubella virus
- B. CMV
- C. Varicella
- D. RSV

803. The following statements regarding HIV are true EXCEPT ONE:

- A. It belongs to the family *Reteroviridae*
- B. It is an oncogenic virus
- C. The virus is present in all body fluids
- D. The sexual route is the main mode of transmission

804. The following viruses are transmitted by the fecal-oral route EXCEPT ONE:

- A. HAV
- B. HEV
- C. HDV
- D. Entero

805. All of the following viruses can be transmitted sexually EXCEPT ONE:

- A. HIV
- B. HBV
- C. HSV-2
- D. Rubella

806. Which of following is a segmented ds-RNA virus?

- A. Togavirus
- B. HAV
- C. Rotavirus
- D. Parvovirus

807. All the following viruses are transmitted by respiratory routes EXCEPT ONE:

- A. Human papilloma virus
- B. Rhinovirus
- C. Adenovirus
- D. Measles virus

808. All the following viruses are disseminated throughout the body EXCEPT ONE:

- A. HIV
- B. HBV
- C. Rabies virus
- D. Human papilloma virus

809. An important defense function of cytotoxic T lymphocytes in viral infection is to:

- A. Lyse virus infected cells
- B. Fragment viral nucleic acid by nucleases
- C. Neutralize free virus particles
- D. Lyse viral capsid

810. All of the following association are true EXCEPT ONE:

- A. CMV causes heterophil-negative mononucleosis
- B. Mumps virus can cause meningitis
- C. Poliovirus can cause paralytic disease
- D. Astrovirus causes gastroenteritis only in adults

811. The bacterial flagellin is detected by which TLR?

- A. TLR2
- B. TLR6
- C. TLR5
- D. TLR9

812. Each of the following diseases is associated with infection by picornaviruses EXCEPT ONE:

- A. Myocarditis
- B. Hepatitis
- C. Meningitis
- D. Mononucleosis

813. Certain viruses have been associated with birth defects; these teratogenic viruses include EXCEPT:

- A. Rubella virus
- B. CMV
- C. VZV
- D. Rhinovirus

814. Which one of the following statements concerning mumps is CORRECT?

- A. The testes, ovaries and pancreas can be involved
- B. There is no vaccine against mumps
- C. Passive immunization is the only means of preventing the disease
- D. Second episodes of mumps can occur, since there are 2 serotypes

815. Each of the following statements concerning HAV is correct EXCEPT ONE:

- A. The initial site of viral replication is the GIT
- B. The diagnosis is usually made by isolating the virus in cell culture
- C. HAV commonly causes asymptomatic infection in children
- D. It is a member of the family picornaviridae

816. All the following viruses belong to the Picornaviridae EXCEPT ONE:

- A. Rhinoviruses
- B. Poliovirus
- C. Rabies virus
- D. Echovirus

817. Acute hemorrhagic conjunctivitis is caused by which of the following viruses:

- A. Coronavirus
- B. Reovirus
- C. Rhinovirus
- D. Enterovirus

818. Epidemic pleurodynia and myocarditis are both caused by:

- A. Group B Coxsackievirus
- B. Polymavirus
- C. RSV
- D. Reovirus

819. All the following are acceptable specimens for the isolation enterovirus EXCEPT ONE:

- A. Feces
- B. CSF
- C. Throat secretions
- D. Urine

820. When infectious mononucleosis is suspected, all the following tests can be useful EXCEPT ONE:

- A. IgM antibody to EB-VCA
- B. IgG antibody to EB-VCA
- C. Antibody to EB-NAs
- D. Culture

821. Which of the following statements best describes rotavirus?

- A. It is an RNA virus
- B. Tests for detection of antigen are rarely useful
- C. It is rarely a nosocomial pathogen
- D. Person-to-person transmission is rare

822. Infectious mononucleosis is characterized by which of the following statements?

- A. It is caused by rhabdovirus
- B. The causative pathogen is an EBV
- C. Affected person responds to treatment with the production of heterophil antibodies
- D. Ribavirin is the treatment of choice

823. The most sensitive method of detecting infection by CMV in the newborn is:

- A. Isolation of virus
- B. Detection of IgM antibody by IF
- C. Direct detection of antigen by ELISA
- D. Detection of complement fixing antibodies

824. All the following statements about cytomegalovirus infection are true EXCEPT:

- A. It can be cultured from RBCs of infected persons
- B. It can be transmitted transplacentally
- C. It can be activated by immunosuppressive agents
- D. It can cause retinitis

825. All the following statements about human rotaviruses are true EXCEPT that they:

- A. Produce an infection that is seasonally distributed peaking in fall and winter
- B. Produce cytopathic effects in many conventional cell culture systems
- C. Can be sensitively and rapidly detected in stools by the ELISA technique
- D. Have been implicated as a major etiologic agent of infantile gastroenteritis.

826. A gene for insulin has been inserted into a vector for the purpose of obtaining its protein product only. Such a vector is called

- A. Expression vector
- B. Suppression vector
- C. Storage vector for genomic library
- D. None of the above

827. MHC-I molecules make complex with which immune cells to kill intracellular antigens.

- A. Neutrophils
- B. TH cells
- C. CD68 cells
- D. Tc or cytotoxic T-cells

828. The development, maturation and differentiation of T-lymphocytes occur in which organ?

- A. Bursa of Fabricius
- B. Liver
- C. Thymus
- D. Tonsils

829. Birna viruses destroy which organ in chicken

- A. Heart
- B. Bursa of Fabricius
- C. Lungs
- D. Thymus

830. Example of an obligate anaerobic bacterium is

- A. *Bacillus anthracis*
- B. *Brucella abortus*
- C. *Clostridium tetani*
- D. *Salmonella*

831. Which antibody class is mainly involved in mucosal immunity?
- IgY
 - IgA
 - IgD
 - IgE
832. The oldest and traditionally used adjuvant in vaccines is:
- BCG
 - ISCOMS
 - Alum
 - Montanide
833. A plasmid consisting of its own DNA with a foreign DNA inserted into it is called
- Recombinant plasmid
 - Non-coding DNA
 - Junk DNA
 - None of the above
834. The extra chromosomal, self-replicating, double stranded, closed, circular DNA molecules are called:
- Plasmids
 - Phages
 - Viruses
 - Chloroplasts
835. The jumping genes in bacterial DNA are called as
- Volutin
 - Endosomes
 - Histones
 - Transposons
836. TTS is used against tetanus and is an example of
- DNA vaccine
 - Attenuated vaccine
 - Sub-unit vaccine
 - Autogenous vaccine
837. A gene produced for rDNA technology contains a gene from one organism joined to the regulatory sequence of another gene. Such a gene is called:
- Oncogene
 - Junk gene
 - Chimeric gene
 - Oncogene
838. Which Ab class is not present in chicken?
- IgY
 - IgG
 - IgM
 - IgD
839. A recombinant DNA molecule is produced by joining together
- One mRNA with a DNA segment
 - One mRNA with a tRNA segment
 - Two mRNA molecules
 - Two DNA segments
840. A group of genetically similar organisms obtained by a sexual reproduction is called
- Clone
 - Population
 - Assembly
 - None of these
841. After Gram's staining, Gram positive bacteria are:
- Green
 - Yellow
 - Red
 - Blue/violet
842. Example of yeast is
- Mucor*
 - Rhizopus*
 - Candida albicans*
 - Penecillium*
843. Mycolic acid is present in cell wall _____.
- Listeria*
 - Mycoplasma*
 - Staphylococcus*
 - Mycobacterium*
844. To be useful in the preparation of recombinant DNA, a plasmid must have
- No origin of replication
 - An origin of replication
 - The ability to alternate between the linear and circular forms
 - Restriction endonuclease activity
845. The first human protein produced through recombinant DNA technology is
- Insulin
 - Erythropoitin
 - Interferon
 - Somatostatin
846. Humulin, a genetically engineered insulin was produced and marketed for the first time by
- Biocon India Limited
 - Glaxo
 - Eli Lilly and Company
 - Cipla
847. In one of the techniques of recombinant insulin production the genes for α and β polypeptides were inserted into the plasmid by the side of
- Ori
 - β -galactosidase gene
 - Antibiotic resistant gene
 - Restriction endonuclease gene
848. Endonucleases, a group of enzymes cleave DNA.
- Externally
 - Internally
 - Both 'A' and 'B'
 - Neither 'A' nor 'B'
849. Insulin, a protein, consisting of
- 2 Polypeptide chains
 - 3 Polypeptide chains
 - 4 Polypeptide chains
 - More than 4 Polypeptides chains
850. Before the production of recombinant insulin, insulin for the treatment of diabetes in human was obtained from:
- Healthy humans
 - Dead human body
 - Cows and pigs
 - Dogs and cats

851. The first licensed drug produced through genetic engineering is:

- A. Interferon
- B. Insulin
- C. Penicillin
- D. Somatotropin

852. The plasmid generally used for the production of recombinant insulin is:

- A. RK 646
- B. Ti plasmid
- C. ACY 17
- D. pUC 18

853. *Rauolfia serpentina*, to save this plant under the threat of extinction, which of the following techniques is useful?

- A. Genetic engineering
- B. DNA finger printing
- C. Hybridoma technology
- D. In vitro culture

854. _____ are popularly called "Molecular stichers".

- A. Restriction Endonuclease
- B. Ligases
- C. RNA polymerase
- D. DNA polymerase

855. Restriction endonucleases have ability of cutting:

- A. DNA at random sites
- B. DNA at specific sites
- C. Both 'A' and 'B'
- D. DNA and RNA at random sites

856. A clone is a group of organisms produced by:

- A. Asexual method and genetically similar
- B. Asexual method and genetically dissimilar
- C. Sexual method and genetically similar
- D. Sexual method and genetically dissimilar

857. Expression vectors are those:

- A. Produce protein products
- B. Used for genomic libraries
- C. Used for chromosome synthesis
- D. Used for finger printing

858. *E. coli* is generally used for gene cloning because:

- A. It supports the replication of recombinant DNA
- B. It is easy to transform
- C. It is free from elements that interferes with replication and recombination of DNA
- D. All of these

859. An ideal plasmid to be used for recombinant DNA technology must have:

- A. Minimum amount of DNA
- B. Relaxed replication control
- C. One recognition site for one restriction endonuclease
- D. All of these

860. Restriction endonucleases cut DNA at a specific site that is known as:

- A. Ligation site
- B. ori
- C. Restriction site
- D. Replication site

861. Transfer of recombinant plasmid into *E. coli* needs:

- A. Heat treatment
- B. UV-rays treatment
- C. MgCl₂ treatment
- D. lysis

862. During recombinant insulin synthesis, the bond between insulin polypeptide and galactosidase can be removed by using:

- A. Cyanogen bromide
- B. Chymotrypsin
- C. Carboxy peptidase
- D. Amylase

863. Which of the following statement about a vector is correct?

- A. All vectors are plasmids only
- B. Plasmids, phages can be used as vectors
- C. Fungi can also be used as vectors
- D. Cyanobacteria can also be used as vectors

864. Which of the following statement about plasmids is correct?

- A. Plasmids are present in bacteria only
- B. Plasmids are present in all organisms
- C. Plasmids present in bacteria and phages
- D. Plasmids present in plants and animals

865. _____ is autonomously replicating minichromosome.

- A. Virus
- B. Phage
- C. Plasmid
- D. Lichen

866. Which one of the following statement are NOT attributed to plasmids?

- A. They are circular DNA molecule
- B. They have antibiotic resistant genes
- C. They have the ability of autonomous replication
- D. They have DNA that is as long as chromosomal DNA

867. DNA finger printing was first developed by:

- A. David Suzuki
- B. Khorana
- C. Alec Jaffreys
- D. Gilbert

868. Which one of the following statements about plasmids is correct?

- A. Plasmids are mobile.
- B. Plasmids are made up of RNA and proteins.
- C. Plasmids are present in eukaryotes.
- D. Plasmids are present in fungi.

869. Which one of the following statements about Restriction Endonuclease (RE) is TRUE?

- A. All "RE" cut DNA at specific sites
- B. All "RE" cut DNA at random sites
- C. All "RE" join DNA segments at specific sites
- D. All "RE" join DNA at random sites

870. Transgenic organisms are:

- A. Produced by gene transfer technology
- B. Extinct organisms
- C. Naturally occurring and endemic
- D. Produced by traditional plant breeding technique

- 871. Restriction endonucleases, when present in a host cell act on foreign DNA molecule and cleave them, but they do not act on host DNA molecule. It happens because:**
- Restriction endonuclease cannot act on host DNA
 - Host DNA is packed into chromosomes
 - Host DNA is methylated hence restriction endonucleases can't act.
 - Restriction endonucleases become inactive when they reach host DNA
- 872. The presence of Restriction endonucleases was postulated in 1960 by:**
- Khorana
 - Watson
 - Crick
 - Arber
- 873. The scientists who won Nobel prize for physiology for their discovery of restriction endonucleases are:**
- Jacob and Monod
 - Smith, Nathans and Arber
 - Watson and Crick
 - Alec Jaffreys and Milstein
- 874. Restriction endonucleases are also called:**
- Molecular scissors
 - Molecular stichers
 - DNA synthesis
 - Polymerases
- 875. In restriction endonuclease EcoR1, "E" stands for**
- Extraction
 - The first letter of the genus in which it is present
 - Endonuclease
 - Endangered
- 876. VNTR stands for:**
- Variable nucleotide triplet repeat
 - Variable nucleoside tandem repeat
 - Variable nucleoside triplet repeat
 - Variable number tandem repeats
- 877. Restriction endonucleases recognize specific sequences on DNA called:**
- Non-coding sequences
 - Satellites
 - Palindromes with rotational symmetry
 - Tandem repeats
- 878. Main tools required for recombinant DNA technology are:**
- Vector, desired gene
 - Vector, desired gene, mRNA of desired gene, host, restriction enzymes, ligases
 - Desired gene, host, vector
 - Vector, desired gene, mRNA of desired gene, host
- 879. Prior to the production of recombinant insulin, insulin obtained from cows and pigs were given to patients. Some of the problems faced by this treatment was:**
- The insulin was not active
 - In some humans it induced antibody production
 - It reduces the weight of patients
 - Loss of memory power
- 880. DNA Ligase, used in recombinant DNA technology is obtained from:**
- E. coli* only
 - E. coli* and also Ligase encoded by T₄ phage
 - Saccharomyces*
 - Retroviruses
- 881. Using genetic technique in forensic science is:**
- Genetic finger printing
 - In vitro culture
 - Hybridoma technology
 - Gene therapy
- 882. A technique called southern blotting is used in:**
- Monoclonal antibody production
 - In vitro culture
 - Genetic finger printing
 - Polymerase chain reaction
- 883. Genetic finger printing is useful in:**
- Identifying criminals involved in rape, murder etc.
 - Establishing the parentage of a disputed child
 - Identifying illegal immigrants
 - All of these
- 884. RFLP stands for:**
- Restriction fragment length polymorphism
 - Repeated fragment length polymorphism
 - Renewed fragment length polymorphism
 - Required fragment length polymorphism
- 885. Gene therapy, a technique that helps in**
- Saving endangered species
 - Curing genetic disorders
 - Clonal propagation
 - Producing monoclonal antibodies
- 886. A small, 15-30 bases long nucleotide sequences used to detect the presence of complementary sequences in DNA sample during DNA finger printing is called**
- RFLP
 - Probe
 - VNTR
 - Reporter gene
- 887. A radioactive probe used in DNA finger printing contains**
- 32 P
 - 14 C
 - 12 N
 - pUC18
- 888. Electrophoresis, a technique used in DNA fingerprinting helps to separate:**
- DNA segments
 - Cells from DNA
 - Tissues
 - RNA from DNA
- 889. In DNA finger printing, even a smallest amount of DNA obtained from samples collected at crime place, can be multiplied into millions of copies by using a technique called:**
- Autoradiography
 - Southern blotting
 - Polymerase chain reaction
 - Electrophoresis

- 890. Southern blotting is a technique used in genetic finger printing is called so because:**
- The blotting is done from the south side.
 - It was discovered by a scientist, E.M. Southern.
 - It was popular in South-America.
 - It was popular in southern countries.
- 891. In DNA finger printing, the DNA from the gel is transferred to _____ for hybridization.**
- Nitrocellulose membrane
 - Agarose
 - Autoradiogram
 - PCR
- 892. During DNA finger printing, DNA nucleotides hybridized with probe can be detected through:**
- Electrophoresis
 - Polymerase chain reaction
 - Autoradiography
 - Hybridoma
- 893. In somatic cell gene therapy, the functional genes can be introduced into:**
- Sperm
 - Egg
 - Any body cells
 - Germinal cells
- 894. During the recent tsunami disaster, a child was separated from its parents in Sri Lanka. Later with the help of technique the child was made to reunite with its true parents. The technique is:**
- DNA finger printing
 - Gene therapy
 - Tissue culture
 - Hybridoma technology
- 895. Genes have been transferred into animals with a view to obtain a large-scale production of the proteins encoded by these genes in the milk, blood etc. This approach is also referred generally as**
- In vitro culture
 - Molecular farming
 - Gene therapy
 - Hybridoma technology
- 896. RFLP, VNTR, Probe are some of the terminologies associated with:**
- Hybridoma technology
 - Tissue culture
 - DNA finger printing
 - CFT
- 897. In 1990, the first gene-therapy was conducted on a 4-year-old girl in US. The girl was suffering:**
- AIDS
 - CANCER
 - SCID
 - Malaria
- 898. SCID, a disease can be cured by Gene therapy is due to the deficiency of:**
- ADA enzyme
 - Insulin
 - Glucagon
 - Dystrophin
- 899. A device in which a substrate of low value is utilized by living cells or enzymes to generate a product of higher value is called**
- Bioreactor
 - Test tube culture
 - Electrophoresis
 - Chromatography
- 900. Gene therapy, a method to cure inherited disease by**
- Repairing the faulty gene
 - Introducing the correct copy of the gene
 - Adding new cells to the body
 - Polymerase chain reaction
- 901. During gene therapy, the possible ways through which the genes can be introduced into the cell are:**
- Micro injection
 - Some viruses
 - Both "A" and "B"
 - Erythrocytes
- 902. DNA finger printing helps in:**
- Identifying illegal immigrants
 - Detecting the real parent of child
 - Detecting the suspect involved in crime
 - All of these
- 903. In one type of gene therapy, functional genes are introduced into the sperm or the egg. This is called:**
- Somatic cell gene therapy
 - Germline gene therapy
 - Vegetative cell gene therapy
 - Gametic gene therapy
- 904. Glucose is added to the tissue culture media as:**
- Growth regulator
 - Carbon source
 - Solidifying agent
 - An antibiotic
- 905. Explant is**
- Any cut part of the plant used in tissue culture
 - A plant extract used in tissue culture
 - A source of growth regulators added to media
 - Solidifying agent
- 906. The work 'Hybridization' in DNA finger printing means:**
- Pairing b/w nucleotides of DNA sample with probe
 - Pairing b/w the nucleotides of DNA and mRNA
 - Pairing b/w the nucleotides of probe with mRNA
 - Pairing between the nucleosides with mRNA
- 907. Dolly, the first animal produced through cloning is:**
- Camel
 - Rat
 - Cow
 - Sheep
- 908. Fearing that the child to be born may have a genetic disorder, a couple goes to a doctor. Which one of the techniques will be suggested by the doctor cure genetic disorder?**
- Hybridoma technology
 - Gene therapy
 - ELISA
 - DNA finger printing

909. The genes introduced through somatic cell gene therapy are:

- A. Heritable
- B. Non-heritable
- C. Partially heritable
- D. None of these

910. In biotechnology, mass culturing of cells / microbes can be achieved by using

- A. Test tube culture
- B. Bioreactor
- C. Autoclave
- D. Electrophoresis

911. A bioreactor known for mass culturing of cells / microbes must have

- A. Agitation for mixing of cells and medium
- B. Sterile conditions
- C. Regulation of temperature, aeration, etc.,
- D. All of these

912. In vitro culture of plant parts need

- A. Controlled environmental condition
- B. Aseptic condition
- C. Maintenance of pH
- D. All of these

913. Bioreactors are used for

- A. Large scale production of desired substances by using cells / microbes
- B. Kill bacteria
- C. To store viruses
- D. To get chemicals

914. The basic components of tissue culture media are

- A. Micro and macro nutrients, glucose
- B. Micro and macro nutrients, vitamins, agar
- C. Micro and macro nutrients and growth regulators, glucose
- D. Micro and macro nutrients, growth regulators, agar, vitamins, glucose

915. Agar is added to tissue culture media as:

- A. Carbon source
- B. A growth regulator
- C. Nitrogen source
- D. Solidifying agent

916. Stem cells found in umbilical cord blood is

- A. Totipotent
- B. Pluripotent
- C. Omnipotent
- D. Multipotent

917. Which one of the following statements about plant tissue culture is correct?

- A. The culturing of root is not possible
- B. Any cell that is totipotent can be cultured
- C. The pH of the media need not be maintained
- D. Fruit juices are added to media as carbon source

918. With reference to biotechnology, microinjection is a method of:

- A. Injecting a solution of DNA into nucleus of a cell
- B. Injecting nutrients into a cell culture media
- C. Injecting microbes into a cell culture media
- D. Injecting medicine to human beings

919. Agar, used in plant tissue culture is extracted from:

- A. A fungus
- B. A bacterium
- C. An alga
- D. A virus

920. Totipotency refers to:

- A. The ability of a plant cell to arrest growth of a plant
- B. The ability of a plant cell to develop disease
- C. The ability of a plant cell to develop into a complete plant
- D. The ability of a plant cell to develop into a callus

921. The main aim of human genome project is:

- A. To identify and sequence of all the genes present in the human body
- B. To introduce new genes to human beings
- C. To remove disease causing genes from humans
- D. To improve techniques of finger printing

922. Bt cotton is a:

- A. A cotton variety obtained by crossing two different cotton plants
- B. A cotton variety brought from South America
- C. An insecticide sprayed on cotton plant
- D. A transgenic cotton variety

923. Somatic embryos are:

- A. Embryos developed from zygote after fertilization
- B. Embryos developed from egg without fertilization
- C. Embryo like structure settled from cells of callus
- D. Embryo developed by ovules

924. An amorphous mass of loosely arranged thin-walled parenchyma cells developing from explant is called:

- A. Thallus
- B. Callus
- C. Callose
- D. Embryoids

925. The name "Golden rice" is given to a rice variety because:

- A. It contains traces of gold
- B. It is obtained from areas where gold mining is done
- C. The seeds are golden yellow in color because of the presence of β -carotene
- D. It is made of gold

926. Fruit juice or coconut milk is added to plant tissue culture media because:

- A. It is a source of micronutrients
- B. It is a source of macronutrients
- C. It is a source of growth regulators
- D. It helps in maintaining pH of the media

927. pUC 18 is a

- A. Phage used as a vector
- B. Bacteria used for transformation
- C. Restriction endonuclease
- D. A plasmid

928. The process of introduction of foreign DNA into an animal cells is called

- A. Transversion
- B. Conversion
- C. Inversion
- D. Transfection

929. The cloned sheep “Dolly” had a genotype which is:

- A. Haploid and identical to that of mother’s egg cell
- B. Diploid & alike to that of mother’s somatic cells
- C. Diploid with the haploid set of chromosomes from the father and other from the mother
- D. Diploid & alike to that of the donor’s somatic cells

930. Pluripotent cells derived from the early pre implantation of an embryo in mice are called:

- A. Stem cells
- B. Organ culture
- C. Somatic cell hybridization
- D. Hybridoma

931. A segment of DNA that reads from the same forward and backward is called:

- A. Palindromic DNA
- B. Complementary DNA
- C. Plasmid DNA
- D. Copy DNA

932. The chemical nature of ‘humulin’ produced by recombinant DNA technology is:

- A. Lipid
- B. Protein
- C. Monosaccharide
- D. Vitamin

933. Which of the following is associated with DNA finger printing?

- A. Hybridoma
- B. Site specific mutagenesis
- C. Shotgun cloning
- D. RFLP

934. Which technique would most likely be used to produce a large number of genetically identical offspring?

- A. Cloning and in vitro culture
- B. Polymerase chain reaction
- C. Chromatography
- D. Electrophoresis

935. The restriction endonucleases are called so because:

- A. They have a very restrictive or site specific endonuclease activity
- B. They cut DNA at a few restricted sites
- C. They restrict the entry of foreign DNA into the cell by cleaving the DNA due to endonuclease activity
- D. Their distribution is restricted to only some bacterial cells

936. A hybridoma cell:

- A. Produces different types of antibodies against different types of antigens
- B. Produces only specific antibodies only against a specific antigen
- C. Produces different types of antibodies but only one type of antigen
- D. None of the above

937. A cancerous / myeloma cell in hybridoma helps in:

- A. Continuous growth of hybridoma
- B. Production of antibodies
- C. Both “A” and “B”
- D. Neither “A” nor “B”

938. Which one of the following organism is used for the large scale production of recombinant insulin?

- A. *Plasmodium*
- B. *Agrobacterium*
- C. *Rhizobium*
- D. *E. coli*

939. The unique feature of monoclonal antibody is that:

- A. It is specific to a single antigenic determinant of a single antigen
- B. It is non-specific
- C. It is specific to a few antigenic determinants
- D. Restricted growth

940. ‘Thermal Cycler’ is used in the reaction:

- A. Enzyme linked immune-sorbant assay
- B. Ligation reaction
- C. Polymerase chain reaction
- D. Immobilization reaction

941. Construction of a recombinant DNA involves:

- A. Cleaving DNA with restriction endonuclease and joining with ligase
- B. Cleaving DNA with ligase and joining with endonuclease
- C. Cleaving and joining DNA with restriction endonuclease
- D. Cleaving DNA with restriction endonuclease and joining with polymerase

942. ECOR1 is a:

- A. DNA ligase enzyme
- B. Restriction endonuclease
- C. A vector used for insulin synthesis
- D. A plasmid used as a vector

943. Which one of the following techniques is successfully used to compare two DNA samples?

- A. Hybridoma technology
- B. ELISA
- C. Genetic finger printing
- D. Gene therapy

944. The unique feature of pluripotent stem cells is:

- A. They can develop into any tissue of the body
- B. They can develop into whole individuals
- C. They help in production of monoclonal antibodies
- D. All of these

945. Stem cells can be obtained from:

- A. Embryo only
- B. Any part of the body
- C. Blood only
- D. Embryo, bone marrow, umbilical cord blood etc

946. All antibodies produced through hybridoma are:

- A. Polyclonal
- B. Monoclonal
- C. Non-active
- D. Over-active

947. Which of the following codons is NOT a termination codon for protein synthesis?

- A. UUU
- B. UAG
- C. UAA
- D. UGA

948. A type of β -lymphocyte that produces antibody is:

- A. Plasma cell
- B. Memory cell
- C. Adipocyte
- D. Erythrocyte

949. Which of the following are the two methods of screening?

- A. Hybridization and PCR
- B. ELISA and blotting
- C. ELISA and PCR
- D. PCR and RFLP

950. Monoclonal antibodies are usually produced from:

- A. Myeloma cells
- B. Hybridoma cells
- C. Monocytes
- D. Adipocytes

951. To produce monoclonal antibodies in large scale, the techniques that can be used are:

- A. In vivo in the peritoneal cavity of mice
- B. In vitro in large scale culture vessels
- C. Both "A" and "B"
- D. Neither "A" nor "B"

952. Which one of the following therapies can be suggested to cure a person who is suffering from spinal cord injuries?

- A. Hybridoma
- B. Gene therapy
- C. Stem cell therapy
- D. Recombinant DNA technology

953. cDNA, a term used in recombinant DNA technology means:

- A. Competitive DNA
- B. Chemical DNA
- C. Complex DNA
- D. Complementary DNA

954. Which of the following enzyme is used in PCR?

- A. Taq DNA polymerase
- B. HRP
- C. EcoRI
- D. EcoRII

955. Which of the following enzyme is used in ELISA?

- A. Taq DNA polymerase
- B. HRP
- C. EcoRI
- D. EcoRII

956. Which of the following is helpful in distinguishing DNA of one individual from another?

- A. PCR
- B. Reverse transcriptase
- C. cDNA
- D. RFLP

957. Which of the following is the correct order of organization of genetic material from largest to smallest?

- A. Genome, chromosome, gene, nucleotide
- B. Nucleotide, gene, chromosome, genome
- C. Gene, nucleotide, chromosome, genome
- D. Chromosome, genome, nucleotide, gene

958. A hybridoma is:

- A. A hybrid cell obtained by fusing a β -lymphocyte with a myeloma cell in vitro
- B. A hybrid cell obtained by fusing a β -lymphocyte with a myeloma cell in vivo
- C. A hybrid cell obtained by fusing 2 β -lymphocyte cells in vitro
- D. A hybrid cell obtained by fusing any 2 body cells in vitro

959. Monoclonal antibodies are nowadays used in:

- A. Disease diagnosis
- B. Detection of specific type of pathogen
- C. Very early and accurate detection of cancer
- D. All of these

960. _____ is a non-essential amino acid.

- A. Serine
- B. Threonine
- C. Lysine
- D. Histidine

961. Which of the following is an essential amino acid?

- A. Cysteine
- B. Asparagine
- C. Glutamine
- D. Phenylalanine

962. Peptide bond is a:

- A. Covalent bond
- B. Ionic bond
- C. Metallic bond
- D. Hydrogen bond

963. A tripeptide has:

- A. 3 amino acids and 1 peptide bond
- B. 3 amino acids and 2 peptide bonds
- C. 3 amino acids and 3 peptide bonds
- D. 3 amino acids and 4 peptide bonds

964. Immunoglobulin consists of:

- A. A light chain and two heavy chains joined by disulfide bond
- B. Two light chains and a heavy chain joined by disulfide bond
- C. Two light chains and two heavy chains joined by disulfide bond
- D. Two light chains and two heavy chains joined by hydrogen bond

965. The pattern on paper in chromatography is called:

- A. Chroming
- B. Chroma
- C. Chromatograph
- D. Chromatogram

966. Antibody present in secretions like tears & saliva is:

- A. IgA
- B. IgE
- C. IgG
- D. IgM

967. Unfolding of a protein can be termed as:

- A. Renaturation
- B. Denaturation
- C. Oxidation
- D. Reduction

968. A process by which a protein structure assumes its functional shape or conformation is

- A. Denaturing
- B. Folding
- C. Synthesis
- D. Hydrolysis

969. Which of the following is an IMINO ACID (Secondary amino acid)?

- A. Alanine
- B. Glycine
- C. Proline
- D. Serine

970. Which of the following is a true statement?

- A. IgG is involved in primary immune response
- B. IgM is involved in primary immune response
- C. IgG is involved only in secondary immune response
- D. IgG and IgM both are involved in primary immune response

971. Which of the following enzyme is responsible for the regulation of biological nitrogen fixation?

- A. Dinitrogenase reductase
- B. Dinitrogenase oxidase
- C. Phosphatase
- D. Kinase

972. Which of following is a function of macrophages?

- A. Ingest large particles and cells by phagocytes
- B. Produce and secrete antibodies
- C. Interact with infected host cells through receptors on T-cell surface
- D. Interact with macrophages and secrete cytokines

973. Which of the following is a function of B lymphocytes?

- A. Ingest large particles and cells by phagocytes
- B. Produce and secrete antibodies
- C. Interact with infected host cells through receptors on T-cell surface
- D. Interact with macrophages and secrete cytokines

974. Which of the following is a function of T lymphocytes?

- A. Ingest large particles and cells by phagocytes
- B. Produce and secrete antibodies
- C. Interact with infected host cells through receptors on TCR
- D. Interact with macrophages and secrete cytokines

975. The extra chromosomal, self-replicating, closed, double stranded and circular DNA molecule is generally termed as:

- A. Chromosome
- B. Plasmid
- C. Genomic DNA
- D. Bacteriophage

976. Which of the following is the largest immunoglobulin?

- A. IgA
- B. IgE
- C. IgG
- D. IgM

977. Which of the following antibody first reaches the site of infection?

- A. IgA
- B. IgE
- C. IgG
- D. IgM

978. Where do T-lymphocytes develop into fully competent but not activated T-cells?

- A. The thymus gland
- B. The lymph nodes
- C. The thyroid gland
- D. The bone marrow

979. Which of the following is an example of monosaccharide?

- A. Galactose
- B. Sucrose
- C. Lactose
- D. Maltose

980. The allosteric inhibitor of an enzyme:

- A. Causes the enzyme to work faster
- B. Binds to the active site
- C. Participates in feedback regulation
- D. Denatures the enzyme

981. What is the composition of nucleoside?

- A. a sugar + a phosphate
- B. a base + a sugar
- C. a base + a phosphate
- D. a base + a sugar + phosphate

982. Which of the following is an example of disaccharide?

- A. Glucose
- B. Fructose
- C. Galactose
- D. Maltose

983. Lactose is a disaccharide of which of the following sugar units?

- A. Glucose and fructose
- B. Glucose and galactose
- C. Glucose and sucrose
- D. Glucose and ribose

984. Which of the following is an example of bacterial and yeast polysaccharide?

- A. Starch
- B. Glycogen
- C. Cellulose
- D. Dextran

985. When all monosaccharides in a polysaccharide are same type, such type of a polysaccharide is called a

- A. Glycogen
- B. Homoglycan
- C. Heteroglycan
- D. Oligosaccharide

986. Which of the following are the storage polysaccharides?

- A. Glycogen
- B. Cellulose
- C. Chitin
- D. Glucose

987. The most abundant immunoglobulin is:

- A. IgA
- B. IgE
- C. IgG
- D. IgM

988. Glucose is stored in plants as _____.

- A. Glycogen
- B. Starch
- C. Dextrin
- D. Cellulose

989. Glucose is stored in liver as _____.

- A. Glycogen
- B. Starch
- C. Dextrin
- D. Cellulose

990. Which of the following are the structural polysaccharides?

- A. Glycogen
- B. Starch
- C. Chitin
- D. Glucose

991. Which of the following is an analogous to starch?

- A. Cellulose
- B. Glycogen
- C. Sucrose
- D. Chitin

992. Identify the purine base of nucleic acids in the following:

- A. Cytosine
- B. Thymine
- C. Uracil
- D. Adenine

993. Which of the following are not the components of RNA?

- A. Thymine
- B. Adenine
- C. Guanine
- D. Cytosine

994. What is the composition of nucleotide?

- A. a sugar + a phosphate
- B. a base + a sugar
- C. a base + a phosphate
- D. a base + a sugar + phosphate

995. Group of adjacent nucleotides are joined by:

- A. Phosphodiester bond
- B. Peptide bond
- C. Ionic bond
- D. Covalent bond

996. The sugar molecule in a nucleotide is:

- A. Pentose
- B. Hexose
- C. Tetrose
- D. Triose

997. Building blocks of nucleic acids are:

- A. Nucleotides
- B. Nucleosides
- C. Amino acids
- D. Histones

998. Number of hydrogen bonds between adenine and thymine?

- A. One
- B. Two
- C. Three
- D. Four

999. Number of hydrogen bonds between guanine and cytosine?

- A. One
- B. Two
- C. Three
- D. Four

1000. Arrangement of nucleotides in DNA can be seen by

- A. Ultracentrifuge
- B. X-Ray crystallography
- C. Light microscope
- D. Electron microscope