114. The atomic number of an element is equal to
(1) Number of protons plus the number of electrons
(2) The number of protons plus the number of neutrons
(3) The number of protons in the atom
(4) The number of neutrons in the atom

115. Following are the applications of biophysics except one
(1) Protein-metal interaction
(2) Development of vaccines
(3) Drug discovery and development
(4) Creating transgenic animals and plants

116. Which of the following are all present in animal cells?
(1) Mitochondria, cell membrane, cell wall, cytoplasm
(2) Chloroplasts, cytoplasm, vacuole, nucleus
(3) Nucleus, cell membrane, mitochondria, cytoplasm
(4) Vacuole, cell membrane, nucleus, mitochondria

117. The first light microscope was discovered by
(1) Louis Pasteur
(2) Antonie Fon leeuwenhock
(3) Kary Mullis
(4) Joseph Lister

118. A sample of cells is placed in a salt solution. The cells shrink and the membrane is distorted. Relative to the cell, the soultion is probably
(1) isotonic (2) hypotonic (3) osmotic (4) hypertonic

119. Phospholipids have hydrophilic and hydrophobic areas within the same molecule. This dual nature of the molecule is described by the term
(1) amphipathic (2) electrostatic (3) polar (4) non-polar

120. Which of the following are not true about cell theory?
(1) All living things are made of cells
(2) All cells come from pre-exisiting biotic component
(3) All cells come from a pre-existing abiotic component
(4) Cells performs all functions of the life

121. Mendel's idea that pairs of characters separate during gamete formation is called the law of
(1) Particulate inheritance (2) Dominance
(3) Segregation (4) Independent assortment

122. What is the most common outcome in the F2 generation of a cross between a tall plant and a dwarf plant?
(1) 1 tall : 1 dwarf (2) 3 tall : 1dwarf
(3) 1 tall : 2 medium : 1 dwarf (4) All tall

123. A human female has _____ pairs of autosomes and sex chromosome complement of
(1) 23, XX (2) 23, X (3) 22, XY (4) 22, XX

124. A replicated chromosome consists of two very long strands of identical chromosomal material called
(1) Telomeres (2) Chromatids (3) Centromers (4) Genes

125. DNA synthesis occurs during the _____ phase of the cell cycle.
(1) Gap 1 (G1) (2) Gap 2 (G2) (3) S (4) Mitosis

126. X-inactivation can be used to identify individuals who are
(1) homozygous unaffected (2) heterozygous
(3) homozygous affected (4) missing X-linked genes

127. Hemophilia in humans is due to an X-chromosome mutation. What will be the results of mating between a normal (non-carrier) female and a hemophilac male?
(1) half of daughters are normal and half of sons are haemophilic
(2) all sons are normal and all daughters are carriers
(3) half of sons are normal and half are hemophilic; all daughters are carriers
(4) all daughters are normal and all sons are carriers

128. Which of the following genetic conditions is not sex-linked?
(1) Ichthyosis (2) Colorblindness (3) Sickle-cell anemia (4) Haemophilia

129. Can a male be a carrier for a sex-linked disease?
(1) yes, if the trait is recessive
(2) yes, if the male's father and mother were carriers
(3) no, males have only a single copy of sex-linked genes
(4) no, males have two copies of sex-linked genes

130. Histones are found in
(1) Nucleoi (2) Cytoplasm (3) Cisternae (4) Mitochondria

131. What is the process of heating liquids or food at high temperatures to destroy foodborne pathogens?
(1) high pressure processing (2) Pasteurization
(3) boiling (4) irradiation

132. Which of the following is a micronutrient?
(1) Carbon (2) Manganese (3) Potassium (4) Magnesium

133. Marine microbes are typically_____
(1) acidophiles (2) halophiles (3) alkaliphiles (4) thermophiles

134. To which kingdom do the cyanobacteria belong?
(1) Fungi (2) Eubacteria (3) Protista (4) Plantae

135. Which of the following was the first widely used antiseptic and disinfectant?
(1) Chlorine (2) Phenol (3) Iodine (4) Alcohol

136. Cryopreservation is a method used for preserving samples by
(1) freezing at 0°C (2) freezing at –50°C
(3) freezing in liquid nitrogen at –196°C (4) freezing in liquid nitrogen at –50°C

137. One of method is an indirect measurement of microorganisms
(1) pour plate method (2) Turbidity method
(3) Streat plate method (4) Microscopic method

138. Which of the following obtain energy from the oxidation of inorganic or organic chemicals?
(1) Chemotroph (2) Lithotroph (3) Autotroph (4) Phototroph

139. The average time required for a freshly divided cell to divide into two daughter cells is called
(1) exponential flow rate (2) generation time
(3) division time (4) growth rate

140. An organism is completely dependant on atmospheric O_2 for growth. This organism is a(n)
(1) Osmotolerant (2) Facultative anaerobe
(3) aerotolerant anaerobe (4) Obligate aerobes

141. In the Air lift bioreactor mixing is accomplished by
(1) Agitator (2) Air from sparger
(3) Baffle (4) Draught tube

142. Main functions of baffles in a bioreactor is
(1) To prevent a vortex
(2) To increase aeration
(3) To reduce interfacial area of oxygen transfer
(4) To reduce aeration rate

143. To optimize the bioreactor system, which one of the following system is least important for anaerobic fermentation?
(1) Culture agitation to maintain oxygen supply
(2) Restriction of entry of contaminating organisms
(3) Control of parameters like pH and temperature
(4) Maintenance of constant culture volume

144. In large scale fermentation the preferred method of sterilization is
(1) Chemical method
(2) Radiation
(3) Filtration
(4) Heat

145. For turbine aeration agitaion unit the power consumption
(1) Is same for gassed and ungassed systems
(2) Increase with decreasing turbine diameter
(3) Decreasing with decreasing turbine diameter
(4) Is smaller for gassed system than for ungassed systems

146. Increasing the stirrer speed improves the value of
(1) Reynolds number
(2) Power number
(3) Mixing time
(4) $K_L A$

147. A batch reactor is characterized by
(1) Constant Residence Time
(2) Variation in extent of reaction and properties of the reaction mixture with time
(3) Variation in reactor volume
(4) Very low conversion

148. Which one of the follwiing pieces of information cannot be obtained from a computer controlled bioreactor?
(1) Dissolved oxygen
(2) Substrate concentration
(3) Molecular mass of end product
(4) Rate of Biosynthesis of the end metabolite

149. Chemostat can be operated at dilution rate _____than the specific growth rate when the cell recycle is used.
(1) Higher
(2) Lower
(3) Uncertain
(4) Equal to specific growth rate

150. Plug-flow reactor is characterized by
(1) High capacity
(2) Presence of axial mixing
(3) Presence of lateral mixing
(4) Constant composition and temperature

151. DNA double helix is identified by
(1) Mendal
(2) Jacob and Monod
(3) John C.Kendrew
(4) Watson and Crick

152. A nucleoside molecule consists of
(1) Chemical base + sugar & phosphate molecule
(2) Chemical base & phosphate molecule
(3) Chemical base + sugar molecule
(4) sugar & phosphate molecule

153. Okazaki fragments consists of
(1) DNA (2) RNA (3) RNA & DNA (4) t-RNA

154. Phenylketonuria an inborn error of phenylalanine metabolism is due to
(1) Excess of Phenylalanine hydroxylase
(2) Excess of Phenylalanine transferase
(3) Lack or reduced levels of Phenylalanine hydroxylase
(4) Excess of Phenylalanine

155. Phenylketonuria disease is inherited as an
(1) Autosomal recessive (2) Autosomal dominant
(3) Co-dominance (4) Dominant

156. Mutations_____ effect is called silent mutations.
(1) with drastic (2) with partial (3) with multi (4) without apparent

157. The synthesis of the single strand of messenger RNA on the DNA is known as
(1) replication (2) translation
(3) mutation (4) transcription

158. A weak attractive force acting over only very short distances, resulting from attraction of induced dipoles is
(1) van der Waals force (2) hydrogen bonds
(3) electrostatic force (4) hydrophobic and hydrophilic forces

159. A mutation occurring in any cell that is not destined to become a germ cell is called as
(1) Germ line mutation (2) silent mutation
(3) spontaneous mutation (4) somatic mutation

160. The chromosome state in which each type of chromosome except for the sex chromosomes is always represented twice is
(1) Diploid state (2) haploid state
(3) multiploid state (4) uniploidy state

161. Totipotency refers to
(1) Ability of single cell to undergo Apoptosis
(2) Ability of single cells to divide & differentiate
(3) Ability of single cell to stay undivided
(4) Ability of single cell to mutate

162. Callus is

(1) A Differentiated mass of cells
(2) An Undifferentiated mass of cells
(3) A dead mass of cells
(4) An organ of a plant

163. BAP is a

(1) Auxin (2) Cytokinin (3) Gibberellin (4) Ethylene

164. In in vitro culture, Excess of Cytokinin supply results in

(1) Shoot formation
(2) Embryo formation
(3) Root formation
(4) Flower induction

165. Macerozyme is

(1) An enzyme mix used for cutting DNA
(2) An enzyme mix used to fuse plasmids in plants
(3) An enzyme mix used to isolate protoplast
(4) An enzyme mix used to join DNA

166. Virus free plants can be obtained from

(1) Callus culture
(2) Meristem culture
(3) Root culture
(4) Anther culture

167. Viability of protoplasts can be assessed by

(1) FDA
(2) Safranine
(3) Acetocaramine
(4) Eosin

168. Cybrids are

(1) Cytoplasmic bridges
(2) Cytoplasmic hybrids
(3) Protoplasmic bridges
(4) Protoplasmic connections

169. Plant Transformation refers to
(1) Transfer of plant from *in vitro* to green house
(2) Transfer of plant from green house to field
(3) Transfer of foreign gene into plant
(4) Transfer of foreign protein in plant

170. Ti plasmid contains
(1) RDNA (2) TDNA (3) RRNA (4) TRNA

171. *Agrobacterium rhizogenes* mediated transformation leads to formation of
(1) crown gall tumor (2) haploids
(3) new flowers (4) hairy roots

172. Acetosyringone is
(1) A secretory hormone (2) A secretory Enzyme
(3) A secretory sugar (4) A phenolic exudate

173. Subculturing of freshly isolated cells in cultures is called as
(1) primary culture (2) passages
(3) tertiary culture (4) cell cultures

174. A cell which has length more than twice its width could be termed as
(1) Epithelial (2) 3T3 cells
(3) Mesenchymal cells (4) fibroblastic

175. Serum protect trypsinised cells from proteolysis by
(1) proteast inhibitors (2) lipases
(3) lyases (4) Hydrolysis

176. RPMI 1640 stands for
(1) Roswell park memorial Institute
(2) Rockwell Park Memorial Institute
(3) Rapid Prototyping and Mammal Institute
(4) Rosewood prototyping and manufacturing institute

177. The cells that require attachment for growth is known as
(1) Dependent cells
(2) Anchorage Dependent cells
(3) Independent cells
(4) Anchorage Independent cells

178. The first attempt of organ culture was done using
(1) Raft method (2) Grid method (3) Agar gel (4) Plasma clot

179. Which of the following is not the advantages of organ culture?
(1) The development of foetal organs in vitro is comparable to that in vivo
(2) Provide information on patterns of growth, differentiation and development
(3) Organ cultures may replace whole animals in experimentation
(4) Organ cultures can be maintained only for few months

180. The process of using glass micropipette (0.5 to 5 micrometer) to insert DNA into the nuclear envelope is known as
(1) Shot gun
(2) Microinjection
(3) Electroporation
(4) Gene gun

181. Typan blue will be
(1) Uptake by living cells
(2) uptake by death cells
(3) Partial uptake by living cells
(4) exclude by death cells

182. _____ can be used to increase the viscosity of the medium.
(1) β-mercapto ethanol
(2) carboxyl methyl cellulose
(3) glutathione
(4) lamanin

183. The first bioinformatics database was created by
(1) Richard Durbin (2) Dayhoff (3) Michael j.Dunn (4) D.Pearson

184. The translated genes of genomes that encode proteins are referred to as
(1) Introns (2) Codons
(3) The open reading frame (4) Pseudogenes

185. The identification of drugs through genomic study
(1) Genomics (2) Cheminformatics
(3) Pharmacogenomics (4) Pharmacogenetics

186. An example of Homology and similarity tool
(1) BLAST (2) EMBOSS (3) RASMOL (4) EMBL

187. One of the following is a primary nucleotide database
(1) PDB (2) Gen Bank (3) Swiss Prot (4) Gen Scan

188. Which of the following levels of protein structure is often stabilized by S-S bonds?
(1) Tertiary structure (2) Primary structure
(3) Secondary structure (4) Super secondary structure

189. The level of polypeptide folding in which the primary sequence coils around itself, stabilized by regularly spaced hydrogen bonds is called
(1) Beta sheet (2) Motif (3) Alpha helix (4) Beta turn

190. The following databases are based on protein secondary structure
(1) Blocks and motif (2) SCOP and CATH
(3) PDB and NCBI (4) DDBJ and SWISSPROT

191. DNA complement of GATCCAT is
(1) TACCTAG (2) CUAGGUA (3) ATGGATC (4) CTAGGTA

192. How many Open Reading frames do you expect from a DNA SEQUENCE ?
(1) 1 (2) 4 (3) 6 (4) 3

193. Glutamate synthetase that catalyses the formation of gluramine from glutamate and ammonia belongs to the class of _____
(1) ligases (2) transferases (3) oxidoreductases (4) isomerases

194. The covalent backbone of a peptide involves the _____ carbon of each amino acid followed by a peptide bond.
(1) Aromatic (2) α- carbon (3) β- carbon (4) aliphatic

195. Non-covalent bonds can be broken by _____
(1) Extreme pH and salt concentrations (2) formic acid
(3) hydrazine (4) Sanger's reagent

196. The type of secondary structure abundant in globular proteins is
(1) antiparallel β -sheets (2) parallel β- sheets
(3) α - helics (4) turns

197. The enzyme used for the lysis of bacterial cell wall is _____
(1) pectinase (2) cellulase (3) lysozyme (4) penicillinase

198. Clarification of fruit juices is done using _____
(1) glucose isomerase (2) invertase (3) pectinase (4) amylase

199. Which among the following is NOT a covalent modification for enzyme entrapment?
(1) Diazotization (2) transesterification
(3) alkylation (4) peptide bond formation

200. Replacement of inactivated or unwanted enzyme by reversible immobilization is possible in
(1) Entrapment (2) diazotization
(3) ionic binding (4) microencapsulation