

PROVISIONAL ANSWER KEY

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Note:

- 1). All Suggestions are to be sent with reference to website published Question paper with Provisional Answer Key Only.
- 2). All Suggestions are to be sent in the given format only.
- 3). Candidate must ensure the above compliance.

101. The Rumen of ruminants is replaced by _____ in non-ruminants,
(A) Caecum (B) Appendix
(C) Omasum (D) Fundus
102. Which of these following ungulates is NOT a ruminant?
(A) Gaur (B) Wild buffalo
(C) Wild ass (D) Yak
103. Rinderpest disease is commonly known as:
(A) Cattle plague (B) Canine plague
(C) Swine plague (D) Fowl plague
104. TRAFFIC aims to ensure that
(A) Wildlife Trade does not happen
(B) India does not export any animal products
(C) Wildlife population is estimated annually
(D) Trade of wildlife is not a threat to nature
105. The only ape present in wild in India is:
(A) Orangutan (B) Chimpanzee
(C) Gorilla (D) Hoolock Gibbon
106. Chytridiomycosis disease has been particularly implicated in the global decline of _____.
(A) Reptiles (B) Amphibians
(C) Aves (D) Apes
107. For a strong hydrogen bond, a donor containing H atom pairs with an atom on the acceptor molecule, which must be,
(A) Electropositive (B) Electronegative
(C) alkali earth metal (D) Large sized atom
108. The core of a folded protein is most likely to be rich in
(A) Negatively charged residues (B) Positively charged residues
(C) Polar residues of either charge (D) Non-polar residues

109. Which of the following neurotransmitters has inhibitory function?
(A) aspartate (B) glutamate
(C) GABA (D) Substance P
110. Which of the following phospholipids are found in the extra-cytoplasmic leaflet in RBC?
(A) sphingomyelin and phosphatidylcholine
(B) sphingomyelin and phosphatidylserine
(C) phosphatidylserine and phosphatidylcholine
(D) phosphatidylethanolamine and sphingomyelin
111. One common interaction between biotic and abiotic components of an ecosystem is,
(A) Metabolism (B) Secondary production
(C) Photosynthesis. (D) Tertiary production
112. Which is the correct equation for Fick's Law of simple diffusion?
(A) $j = D \left(\frac{\Delta c}{\Delta x} \right)$ (B) $j = -D \left(\frac{\Delta x}{\Delta c} \right)$
(C) $j = -D \left(\frac{\Delta c}{\Delta x} \right)$ (D) $j = D \left(\frac{\Delta x}{\Delta c} \right)$
113. In ecology, is a form of competition in which individuals of different species compete for the same resource in an ecosystem,
(A) Intraspecific competition (B) Interspecific competition,
(C) Non Specific competition (D) Symbiosis
114. In allogenic succession changes are brought by the,
(A) External factors (B) Internal factors
(C) Both internal/external factors (D) No factors are responsible
115. In India total _____ bio geographical zones are found,
(A) 4 (B) 7
(C) 20 (D) 10

116. In biodiversity management the approaches which include methods and tools that protect species, genetic varieties and habitats in the wild is,
(A) *Ex-situ* approaches
(B) *In-situ* approaches
(C) Restoration and rehabilitation approaches
(D) Major land use approaches
117. Which of the following single pass trans-membrane proteins has its N-terminus facing the cytoplasm and C-terminus on the exoplasmic face?
(A) type1
(B) type2
(C) type3
(D) type4
118. In the Evolution of *Homo* the first species was,
(A) *Homo habilis*
(B) *Homo erectus*
(C) *Homo ergaster*
(D) *Homo sapiens*
119. Which of the following coated vesicles has a retrograde transport i.e. from Golgi to endoplasmic reticulum?
(A) COPI
(B) COPII
(C) Clathrin, AP2
(D) Clathrin, AP1
120. Which of the following extracellular matrix protein is the most abundant in animal tissues?
(A) Collagen
(B) Glycosaminoglycans
(C) Laminin
(D) Elastin
121. Developmental anomalies that is caused by the Environmental factors are called,
(A) Malformers
(B) Factogens
(C) Morphogens
(D) Teratogens
122. Following are the mismatches, choose it
- | ORGANELLE | MARKER MOLECULES |
|------------------|---------------------|
| (A) Lysosome | Acid phosphatase |
| (B) Peroxisome | Catalase |
| (C) Mitochondria | Cytochrome oxidase |
| (D) SER | Amino acid permease |

123. The sliding of outer microtubule doublets against one another to produce ciliary bending is because of the given protein,
(A) Tubulin (B) Nexin
(C) Kinesin (D) Dynein
124. β -oxidation occurs in the case of mammalian cells in,
(A) Mitochondria (B) Mitochondria and peroxisome
(C) Peroxisome (D) Glyoxisome
125. Tick mark the % of DNA expected to be constituted of light nitrogen after 3 generations where in the Meselson and Stahl experiment, *E. coli* cells grown on heavy nitrogen were transferred to light nitrogen.
(A) 25% (B) 50%
(C) 75% (D) 100%
126. Haematopoietic stem cells (HSCs) exist in the,
(A) Medulla of the bone marrow (B) Cortex of the bone marrow
(C) Medulla of kidney (D) Cortex of the kidney
127. A stretch of DNA that has the ability to replicate autonomously is called a,
(A) Replicon (B) Genome
(C) Plasmid (D) Chromosome
128. During replication of DNA, which one of the following enzyme polymerizes the Okazaki fragments?
(A) DNA polymerase I (B) RNA polymerase
(C) DNA polymerase III (D) DNA polymerase II
129. In ATP synthase, F_0 acts as
(A) H^+ Channel (B) Cl^- carrier
(C) Electron carrier (D) ATPase
130. The following junctions mechanically attach cells to their neighbors or to the extracellular matrix and perform the key function of holding the cells together into tissue.
(A) Occluding junction (B) Tight junction
(C) Anchoring junction (D) Communicating junction

131. The endosymbiont theory of plastids is supported by all of the following properties, EXCEPT
- (A) Introns in plastid DNA genes
 - (B) Antibiotic sensitivity of plastid ribosomes
 - (C) Circular DNA in plastids
 - (D) Ribosome size in plastids
132. The following properties are not associated with DNA polymerase I.
- (A) 5' to 3' exonuclease activity
 - (B) 5' to 3' endonuclease activity
 - (C) 3' to 5' exonuclease activity
 - (D) 5' to 3' polymerase activity
133. The heterolactic fermentation means there is the,
- (A) Production of lactic acid as well as other acids.
 - (B) Production of lactic acid as well as other alcohols.
 - (C) Production of lactic acid as well as other acids and alcohols.
 - (D) Production exclusively of lactic acid
134. The use of biological organisms, usually microorganisms, to remove contaminants, especially from polluted water,
- (A) Is a Bio remediation
 - (B) Is a Phytoremediation
 - (C) Is a Stimulation
 - (D) Is a Augmentation
135. The following statement is INCORRECT,
- (A) DNA Pol III has ability of nick translation
 - (B) DNA Pol I is made up of single polypeptide
 - (C) Rolling circle replication is also known as σ -replication
 - (D) Mitochondrial DNA replicates by D-loop formation
136. Which of the following gene IS NOT transcribed from the promoter for β -galactosidase?
- (A) Lac A
 - (B) Lac Y
 - (C) Lac I
 - (D) Lac Z
137. Kozak is associated with,
- (A) Translation
 - (B) Transcription
 - (C) DNA replication
 - (D) DNA repair

138. RIA was first introduced by,
(A) Hoar and Randall (B) Engvall and Perlmann
(C) S.A Benson and Rosalyn Yalow (D) Carl Laglar
139. Analysis of hormone like aldosterone, insulin, growth hormone, thyroxin is done by,
(A) The application of RIA (B) The application of ELISA
(C) The Folch et al; method (D) The Lowry et al; method
140. RAPD is a useful technique,
(A) To study genomic sequence of DNA.
(B) To construct DNA map
(C) To break DNA sample into fragments and digested by restricting enzymes.
(D) Which is non PCR based.
141. RFLP is a useful technique,
(A) Based on PCR.
(B) In which small quantity of DNA required
(C) To study genomic sequence of DNA.
(D) Which can detect 1-10 loci
142. A triple-stranded intermediate is postulated to occur during,
(A) Excision repair
(B) Eukaryotic DNA replication
(C) Rec A mediated DNA recombination
(D) Thymidine dimer photo reactivation
143. A method to detect whether two mutations are located on the same gene or different genes is
(A) Karyotyping (B) Generalized transduction
(C) Complementation analysis (D) hfr mapping
144. The Ames test is a mass screening approach used for the detection of
(A) Mutagenic carcinogen (B) Toxins
(C) Lactose intolerance (D) Phenylketonuria

145. The following is NOT a function of liver,
(A) Detoxification of drugs (B) Production of bile
(C) Storage of glucose (D) Storage of vitamin C
146. Following is the function of hepatic portal circulation,
(A) To collect absorbed nutrients for metabolic processing or storage
(B) To carry toxins to the venous system for disposal through the urinary tract
(C) Hormone distribution
(D) To transfer bile to the liver from the pancreas
147. During ovulation, all of the following occur EXCEPT
(A) Formation corpus luteum
(B) FSH and LH plasma level surge
(C) Estrogen production reaching its lowest point
(D) Rupture of the graafian follicle
148. Most of the CO₂ transported in blood is,
(A) Dissolved in plasma
(B) As carbamino compounds formed from plasma proteins
(C) As carbamino compounds formed from hemoglobin
(D) As HCO³⁻
149. The T wave of ECG indicates,
(A) Atrial depolarization
(B) Ventricular depolarization
(C) Ventricular repolarization
(D) Atrial repolarization
150. The following is responsible for the ejection of milk from mammary glands in mammals.
(A) Prolactin (B) Oxytocin
(C) Serotonin (D) Melatonin

151. The antigen processing cell in higher organism is,
(A) Megakaryocyte (B) T-cell
(C) Macrophage (D) Eosinophil
152. The following amino acid is NOT synthesized from Pyruvate in bacteria and plants.
(A) Isoleucine (B) Leucine
(C) Valine (D) Alanine
153. About fertilization event following is not true,
(A) The fast block to polyspermy is achieved by changing the electric potential of the egg plasma membrane
(B) Fertilization envelope is developed with the help of mucopolysaccharides
(C) Cortical granule reaction is mechanical block to polyspermy
(D) Sodium permeability is decreased across the egg plasma membrane
154. Each antigenic determinant of the variable region of an antibody is known as,
(A) Idiotype (B) Allotype
(C) Autotype (D) Isotype
155. Erythrocytes are derived from.
(A) Myeloid stem cells (B) Lymphoid stem cells
(C) Megakaryocytes (D) Monocytes
156. Based on the principles of Mendel, number of different genotypes will be obtained for F₂ generation in a trihybrid cross.
(A) 3 (B) 81
(C) 27 (D) 9
157. Reversion as well as suppression can nullify the effect of nonsense mutation. Which of the following processes will help to distinguish between the two kinds of revertants?
(A) Complementation (B) Transgenesis
(C) Test for allelism (D) Recombination

158. The mutation in tumor suppressor gene falls under the following classes.
(A) Frame shift mutation (B) Loss of function mutation
(C) Dominant negative mutation (D) Gain of function mutation
159. A cis-trans complementation test is carried out to identify
(A) If two mutations are allelic in nature
(B) If two genes interact with each other
(C) The number of genes influencing a phenotype
(D) To understand the dominance/recessive relationships between alleles
160. The following DOES NOT represent a strategy for phytoremediation.
(A) Phytodegradation
(B) Phytomining
(C) Continuous removal through hyper accumulators
(D) Chelate-mediated extraction of pollutants
161. Which wild cat is endemic to India?
(A) *Panthera leo pardus* (B) *Panthera leo persica*
(C) *Panthera tigris* (D) *Acinonyx jubatus*
162. In which year was the Wildlife (Protection) Act passed by the parliament in India?
(A) 1975 (B) 1972
(C) 1978 (D) 1973
163. Study of evolutionary history of a species or a larger group of organisms is called:
(A) Euphenics (B) Taxonomy
(C) Phylogeny (D) Euthenics
164. "Father of Modern Taxonomy" who gave binomial nomenclature,
(A) Carolus Linnaeus (B) Jean Baptiste de Lamarck
(C) Robert Brown (D) Charles Robert Darwin
165. Eukaryotic DNA synthesis is inhibited by,
(A) Ampicillin (B) Aphidicolin
(C) Cyclohexamide (D) Chloramphenicol

166. The following enzymes DOES NOT require a primer.
- (A) DNA dependent RNA polymerase
 - (B) RNA dependent DNA polymerase
 - (C) Taq DNA polymerase
 - (D) DNA dependent DNA polymerase
167. The following is most likely to lead to a loss of gene function.
- (A) Missense mutation in the open reading frame.
 - (B) A sequence change in the 3' untranslated region
 - (C) A Frameshift mutation in coding region
 - (D) A change from T to C in the promoter region
168. Cells which are responsible for myelin formation in the peripheral nervous system are,
- (A) Astrocyte
 - (B) Oligodendrocyte
 - (C) Schwann cell
 - (D) Microglial cell
169. The fovea of eye,
- (A) Is the region of highest visual acuity
 - (B) Contains only red and green cones
 - (C) Contains only rods
 - (D) Has the lowest light threshold
170. The following statement about circulatory systems is true.
- (A) Capillaries have thicker walls than veins
 - (B) The systemic circulation carries blood to and from the lungs
 - (C) All invertebrates have an open circulatory system
 - (D) Hormones are transported in the blood
171. Which amino acid does Indole-3-acetic acid (IAA) resemble?
- (A) Glutamic acid
 - (B) Tryptophan
 - (C) Aspartic acid
 - (D) Tyrosin

172. The following combination is correct for the yields of citric acid cycle in respiration.
- (A) 4 GTP, 6 NADH, 4 FADH₂, 2 CO₂
 - (B)** 1 GTP, 3 NADH, 1 FADH₂, 2 CO₂
 - (C) 2 GTP, 2 NADH, 6 FADH₂, 2 CO₂
 - (D) 32 GTP, 2 NADH, 4 FADH₂, 4 CO₂
173. Following is ectodermal in origin.
- (A) Hyoid bone
 - (B) Skeletal muscle
 - (C)** Dentin of teeth
 - (D) Tongue
174. Following taxa is NOT included in Amniotes.
- (A)** Dipnoi
 - (B) Reptilia
 - (C) Marsupialia
 - (D) Edentata
175. Colour blindness occurs in only 0.4% of the females and 8% of males worldwide. What do this type of gender biasness of this disorder state about it?
- (A) It is an X-linked dominant disorder
 - (B) It is an autosomal dominant disorder
 - (C) It is an autosomal recessive disorder
 - (D)** It is an X-linked recessive disorder
176. Which is the best method for checking mycoplasma contamination in a mammalian cell line?
- (A) ELISA
 - (B)** PCR
 - (C) Southern hybridization
 - (D) Western hybridization
177. Following bacteria helps in leaching copper from its ore.
- (A)** *Acidithiobacillus ferrooxidans*
 - (B) *Pseudomonas putida*
 - (C) *Deinococcus radiodurans*
 - (D) *Rhodopseudomonas capsulate*
178. Which of the following microbial fermentations are anaerobic?
- (A) Citric acid and propionic acid
 - (B) Penicillin and vitamin B12
 - (C)** Ethanol and acetone-butanol
 - (D) Streptomycin and rifampicin

179. The following disease DOES NOT leave any paleontological evidence.
- (A) Tuberculosis (B) Rickets
(C) Arthritis (D) Cholera
180. The following is true about haplodiploid sex determination.
- (A) Males produce sperm by mitosis
(B) Males produce sperm by meiosis
(C) Males possess $2n$ chromosomes
(D) Females are produced by parthenogenesis
181. For developing transgenic mice, embryonic stem cells are engineered to express the transgene. These cells are selected by,
- (A) Novobiocin (B) Penicillin
(C) Tetracycline (D) Neomycin
182. Lower limits of detection by sensors are important. Which method of detection is more sensitive than glass electrode used for pH measurement?
- (A) Circular dichroism (B) Absorption spectroscopy
(C) Fluorescence spectroscopy (D) Refractive index
183. To replace animal use in testing hepatic toxicity of a drug on trial, which one of the following used *in vitro* to be closest to the *in vivo* scenario?
- (A) Co-culture of liver parenchymal cells and Kupffer cells
(B) Liver slices
(C) Hepatic cell line
(D) Liver cells
184. The unit of geological time which is distinguished by some feature and is shorter than epoch is known as,
- (A) Age (B) Era
(C) Period (D) Eon

185. Arrange the following zones of mountains located in tropical region, in order of increasing altitude:
- (A) Alpine, Temperate, Tropical, Subtropical
 - (B) Temperate, Tropical, Subtropical, Alpine
 - (C) Alpine, Tropical, Subtropical, Temperate
 - (D)** Tropical, Subtropical, Temperate, Alpine
186. Select the odd one from the following:
- (A) Phagotroph
 - (B)** Autotroph
 - (C) Osmotroph
 - (D) Saprotroph
187. According to Lotka-Volterra equation for competition, two species can coexist indefinitely if
- (A) There is no competition at all when they occupy same niche
 - (B) Intraspecific competition is less than interspecific competition
 - (C)** Interspecific competition is less than intraspecific competition
 - (D) There is a zero isocline for each species, where the number of individuals keeps increasing
188. It is NOT TRUE for early succession in community.
- (A) Entropy is high
 - (B)** Net primary productivity is low
 - (C) Niches are wide
 - (D) Ratio of gross production and standing crop biomass remains high
189. Each temporary stage in succession is called,
- (A) Serial stage
 - (B)** Seral stage
 - (C) Climax stage
 - (D) Early stage
190. A forest changing into grassland community is an example of:
- (A)** Retrogressive succession
 - (B) Allogenic succession
 - (C) Autogenic succession
 - (D) Autotrophic succession
191. The following taxa possess the highest number of species.
- (A)** Insecta
 - (B) Reptilia
 - (C) Mammalia
 - (D) Pisces

192. The following is NOT an endangered animal.
(A) Four-horned antelope (B) Snow leopard
(C) Blackbuck (D) Hispid hare
193. Under which type of conservation strategy does cryo-conservation of the somatic cells of an endangered animal fall?
(A) *In vivo* (B) *In situ*
(C) *Ex situ* (D) *In vitro*
194. Industrial melanism and evolution of Darwin's finches are the examples of,
(A) Natural selection (B) Genetic drift
(C) Bottleneck effect (D) Coevolution
195. Five kingdom classification system was given by:
(A) Carl Woese (B) Copeland
(C) Linnaeus (D) Whittaker
196. Select the odd one out on the basis of the fate of blastopore during embryonic development.
(A) Mollusca (B) Echinodermata
(C) Pisces (D) Mammalia
197. Identify the family of birds known for practicing brood parasitism largely.
(A) Corvidae (B) Gavidae
(C) Cuculidae (D) Spheniscidae
198. Which of the following contains triploblastic acoelomate animals?
(A) Protozoa (B) Cnidaria
(C) Platyhelminthes (D) Aschelminthes
199. Ribosomal RNA is synthesised in,
(A) Ribosomes (B) Cytoplasm
(C) Nucleolus (D) Nucleus
200. Dictyosomes comprising of,
(A) Centromeres (B) Golgi apparatus
(C) Endoplasmic reticulum (D) Nuclear membrane

201. The following is a lysosomal marker enzyme.
(A) Phospholipase (B) Acid phosphatase
(C) Lactate Dehydrogenase (D) Fumarase
202. A gel electrophoresis in which the electric field keeps changing directions is used to separate large molecules of DNA. This technique is called
(A) Southern blot
(B) Northern blot
(C) Pulse field gel electrophoresis
(D) Two dimensional gel electrophoresis
203. Ribophorins are associated with
(A) Ribosomes (B) Nucleus
(C) Endoplasmic Reticulum (D) Plasma membrane
204. Phosphoglycerate mutase is,
(A) Hydrolase (B) Kinase
(C) Phosphatase (D) Isomerase
205. After a vigorous round of exercise, your muscle cells fail to receive the amount of oxygen, which they need to operate the Citric acid cycle. In this case, the glucose in your muscle cells gets converted to
(A) Ethanol via Pyruvate (B) Lactate via Pyruvate
(C) Directly to Lactate (D) Directly to Ethanol
206. Under aerobic conditions, the NAD^+ , which is used in Glycolysis, is refurbished by,
(A) Undergoing mitochondrial oxidation
(B) Reducing Pyruvate to Lactate
(C) Reducing Acetaldehyde to Ethanol
(D) Any of the above, depending on availability of substrate
207. Fructose intolerance can be caused due to deficiency of,
(A) Any of the given three (B) Type B aldolase
(C) Fructose-1,6-bisphosphatase (D) Phosphofructokinase

208. If you are dissecting a Prawn, the hard exoskeleton, which you have to deal with, is actually a polymer of,
(A) N-Acetyl glucosamine
(B) N-Acetyl glucosamine & N-Acetyl muramate
(C) N-Acetyl galactosamine
(D) N-Acetyl galactosamine & N-Acetyl muramate
209. A bear, when in hibernation for, say 6 months, mainly derives its energy from:
(A) Excess food stored as lipids
(B) Excess food stored as glycogen
(C) It wakes up occasionally to feed
(D) It does not need energy since it is hibernating
210. Starch is made up of two different types of glucose polymers: Amylose and Amylopectin. Starch is a,
(A) Heteropolymer
(B) Homopolymer
(C) A mixture of both
(D) Neither
211. In presence of a competitive enzyme inhibitor, which of the following effects is seen on enzyme-substrate reaction?
(A) K_m increases and V_{max} remains same
(B) K_m remains same and V_{max} decreases
(C) K_m increases and V_{max} decreases
(D) K_m decreases and V_{max} increases
212. The number of high energy bonds in ATP is,
(A) 1
(B) 2
(C) 3
(D) 4
213. The following does NOT occur during amphibian metamorphosis.
(A) Growth of Meckel's cartilage
(B) Synthesis of Ornithine cycle enzymes
(C) Porphyrin synthesis
(D) Anokis

214. Which of the following hormones is responsible for morphological changes happening in first instar larva for conversion to second instar larva in a holometabolous insect?
(A) Juvenile hormone (B) 20-Hydroxyecdysone
(C) Ecdysone (D) 17- β -juvenile hormone
215. The acetyl-CoA formed from fatty acid oxidation is under normal conditions,
(A) Used for Krebs's cycle (B) Converted to Acetone
(C) Converted to Acetoacetate (D) Expelled out of the cell
216. The end product of Purine catabolism in mammals other than humans is,
(A) Allantoin (B) Ammonia
(C) Creatinine (D) Uric acid
217. The alpha helix structure of a protein is stabilized by,
(A) Covalent bonds (B) Hydrogen bonds
(C) Disulphide bonds (D) Ionic bonds
218. Coenzyme involved in hydrogen transfer is,
(A) FAD (B) Thiamine pyrophosphate
(C) ATP (D) Coenzyme A
219. Which intermolecular forces are the strongest among the following?
(A) Van der Waal (B) Hydrogen bond
(C) Dipole-dipole (D) Both a and c
220. Vitamin B₁₂ is chemically,
(A) Pantothenic acid (B) Thiamine
(C) Cyanocobalamin (D) Riboflavin
221. Which of the following is an example of a non-covalent interaction in proteins?
(A) Disulphide bridge (B) Phosphodiester bond
(C) Peptide bond (D) Salt bridge

222. In reverse-phase chromatography stationary phase is _____ and mobile phase is _____.
- (A) Polar; non-polar (B) Non-polar; polar
(C) Polar; polar (D) Non-polar; non-polar
223. The gene for which of the following proteins is used as a tool in molecular phylogenetics?
- (A) Cytochrome P450 (B) Lipoxygenase
(C) Cytochrome Oxidase (D) Cyclooxygenase I
224. The microtubular skeleton of a cilium is called
- (A) Dynein (B) Axoneme
(C) Nexin (D) Basal body
225. The range of environmental conditions in which a species is really found.
- (A) Ecosystem (B) The fundamental niche
(C) The realized niche (D) Benthic region
226. Calvin cycle occurs in,
- (A) Stroma (B) Grana
(C) Outer membrane of chloroplast (D) Inner membrane of chloroplast
227. For a speed of 10,000 rpm, the RCF will be,
- (A) 5590 g (B) 11180 g
(C) 16770 g (D) Insufficient information provided
228. A mixture of two peptides, both with same pI, was run on a gel filtration chromatography column. Peptide X eluted from the column first, followed by Peptide Y. From this it can be said that
- (A) Peptide Y has lower molecular weight than peptide X
(B) Peptide X has lower molecular weight than peptide Y
(C) Both peptides are of equal molecular weight but different polarities
(D) Relative molecular weight cannot be predicted in this case

229. In Hyperkalemia in blood the level of _____ is increased.
(A) Potassium (B) Calcium
(C) Sodium (D) Magnesium
230. Lightly packed form of chromatin is known as,
(A) Heterochromatin (B) Euchromatin
(C) Constitutive heterochromatin (D) Facultative heterochromatin
231. In bioenergetics _____ is a spontaneous reaction that releases energy.
(A) Diffusion (B) Exergonic
(C) Endergonic (D) Osmosis
232. It is a type of transducer is,
(A) Active Sensor (B) Passive sensor
(C) Bidirectional transducer (D) All above given
233. For studying molecular interaction using Fluorescence Resonance Energy Transfer, which of the following is essential?
(A) Excitation wavelengths of both molecules must overlap
(B) Emission wavelengths of both molecules must overlap
(C) Excitation wavelength of one molecule must overlap with emission wavelength of the other
(D) Excitation and emission wavelengths of both molecules must be same
234. Oxysomes are present on,
(A) Outer mitochondrial membrane (B) Inner nuclear membrane
(C) Inner mitochondrial membrane (D) Outer nuclear membrane
235. In remote sensing, the sensors are,
(A) Not in direct contact with the objects or events being observed.
(B) Are in direct contact with the objects or events being observed.
(C) Sometimes A or Sometimes B.
(D) Sometimes in contact with the objects or events being observed.
236. Colchicine, a 'mitotic poison', acts by
(A) Inhibiting protein synthesis (B) Inhibiting tubulin polymerization
(C) Inhibiting RNA synthesis (D) Introducing mutations in DNA

237. Maximum exertion can be sustained by skeletal muscles for not more than a few seconds. This is because,
- (A) The debranching enzyme cannot cope with the requirement of rapid glycogen degradation
 - (B) The muscles cannot store enough glycogen
 - (C) The muscles use up all available oxygen in the first few seconds
 - (D) The phosphorylase enzyme is inactivated after a few reaction cycles
238. A compound is oxidized if it
- (A) Loses electron or loses H atom
 - (B) Loses electrons or gains H atom
 - (C) Gains electron or gains H atom
 - (D) Gains electron or loses H atom
239. IgG has four chains. Purified monoclonal IgG was subjected to electrophoresis. The number of bands visible after a reducing SDS-PAGE will be,
- (A) 1
 - (B) 2
 - (C) 4
 - (D) 8
240. In the reagent mixture of a PCR, what is added as substrate for base-pair addition?
- (A) Deoxyribonucleoside triphosphates
 - (B) Deoxyribonucleotide triphosphates
 - (C) Deoxyribonucleoside diphosphates
 - (D) Deoxyribonucleoside monophosphates
241. Consider two double-stranded polynucleotide fragments of equal length, but different sequences. The fragment with a higher GC content must have,
- (A) A higher melting temperature than the other
 - (B) A lower melting temperature than the other
 - (C) Same melting temperature because of same length
 - (D) Impossible to predict
242. US Navy trained which of the following animals for the mission designed for saving the world's smallest porpoise, vaquita?
- (A) Turtles
 - (B) Sharks
 - (C) Whales
 - (D) Dolphins

243. Termites owe their ability to digest wood to an endosymbiont called *Trichonympha*.sp secretes an enzyme that hydrolyses:
- (A) (β 1-4) linkages (B) (α 1-4) linkages
(C) (α 1-6) linkages (D) (β 1-6) linkages
244. Which protein secreted by the amphibian organizer induces neural tissue formation by inhibiting Bone Morphogenetic Protein?
- (A) β -catenin (B) Dishevelled
(C) Dickkopf (D) Noggin
245. Engrailed expression in *Drosophila melanogaster* defines,
- (A) posterior margin of each Para segment
(B) posterior compartment of each segment
(C) anterior margin of the segment
(D) anterior compartment of each segment
246. What type of cleavage is seen during embryogenesis in birds?
- (A) Equal holoblastic (B) Unequal holoblastic
(C) Discoidal meroblastic (D) Discoidal holoblastic
247. Select the option with correct decreasing hierarchy of taxa:
- (A) Kingdom- phylum- cohort- legion- class- order- family- tribe
(B) Kingdom- phylum- class- order- legion- cohort- family- tribe
(C) Kingdom- phylum- class- legion-cohort- order- family- tribe
(D) Kingdom- phylum- class- legion- cohort- family- order- tribe
248. Which one of the following is a correct match of the animal with its taxonomic group?
- (A) Cestoda – Horse shoe crab; Echinoidea – Octopus
(B) Cestoda – Tapeworm; Echinoidea – Octopus
(C) Cestoda – Tapeworm; Echinoidea – Horse shoe crab
(D) Cestoda – Octopus; Echinoidea – Tapeworm
249. Identify a tiger reserve from the following,
- (A) Bison National Park (B) Campbell National Park
(C) Rajaji National Park (D) Velavadar National Park

250. Which of the following sentences is NOT TRUE about Penguins?
- (A) They have blubber under their skin for thermoregulation
 - (B)** They are classified with the flightless birds under paleognathae
 - (C) Their wings are vestigial and have got modified into flippers
 - (D) Other than Antarctica some species of penguins also live in temperate zone
251. The mode of action of rifampicin in E.coli is through
- (A) cell division
 - (B) RNA polymerase binding to DNA template
 - (C)** initiation of transcription
 - (D) inhibition of the oxidation potential
252. The most abundant protein in human blood is,
- (A) transferrin
 - (B) albumin
 - (C) γ -globulin
 - (D)** hemoglobin
253. Which one of the following cell types in the renal corpuscle can influence glomerular filtration by its contraction?
- (A) Podocytes
 - (B) Endothelial cells of glomerular capillaries
 - (C) Parietal epithelial cells of Bowman's capsule
 - (D)** Mesangial cells
254. Mature dendritic cells are capable of,
- (A) Removing red blood cells
 - (B)** Activating antigen-specific T-cells
 - (C) Producing bradykinin
 - (D) Extracellular killing of target cells
255. The normal serum concentrations of immunoglobulin in humans follow the order:
- (A) IgA>IgM>IgE>IgG
 - (B) IgE>IgG>IgM>IgA
 - (C)** IgG>IgA>IgM>IgE
 - (D) IgM>IgA>IgG>IgE

256. Which of the following chemical bonds is NOT involved in antigen binding by antibody?
- (A) Hydrogen bonds (B) Hydrophobic forces
(C) Covalent bonds (D) Van der Waals forces
257. Arrange the following greenhouse gases in ascending order of their relative contribution in global warming.
A- N_2O ; B- CH_4 ; C- CO_2 ; D- CFC
- (A) $A < B < C < D$ (B) $A < D < B < C$
(C) $B < D < A < C$ (D) $A < C < B < D$
258. Find out the INCORRECT combination.
- (A) Dominant epistasis (12:3:1)
(B) Duplicative dominant genes (13:3)
(C) Duplicate recessive epistasis (9:7)
(D) Codominance (1:2:1)
259. A male *Drosophila* has phenotype of yellow body colour and red eyes. Brown (y^+) is dominant over yellow (y) and red (w^+) is dominant over white (w). Both genes are on X chromosome. What is the genotype of this male?
- (A) $X^{wy} Y$ (B) $X^{wy^+} Y$
(C) $X^{w^+y} Y$ (D) $X^{wy^+} X^{wy^+} Y$
260. P-elements cause hybrid dysgenesis in *Drosophila*. Which one of the following crosses between different cytotypes will lead to dysgenesis?
- (A) M-cytotype (Female) X P-cytotype (Male)
(B) M-cytotype (Female) X M-cytotype (Male)
(C) P-cytotype (Female) X M-cytotype (Male)
(D) P-cytotype (Female) X P-cytotype (Male)
261. If non-disjunction occurs during Meiosis, then which one of the following outcomes is most likely to occur?
- (A) One gametes will be $n+1$, two will be 'n' and one will be $n-1$
(B) Two gametes will be normal and two will be $n-1$
(C) Two gametes will be $n+1$ and two will be $n-1$
(D) Two gametes will be normal and two will be $n+1$

262. The concept of recon was proposed by ___ by studying recombination between_____.
- (A) Seymour; lysis mutants of bacteriophage T4
 - (B) Thomas Hunt Morgan; white eye mutants of *Drosophila melanogaster*
 - (C) Benjamin; biochemical mutants of *Neurospora crassa*
 - (D) Ames; auxotrophic mutants of *Escherichia coli*
263. If a single gene exhibits multiple phenotypic expression, that gene is called as:
- (A) Multitopic gene
 - (B) Phylotropic gene
 - (C) Pleiotropic gene
 - (D) Monotropic gene
264. You have a recombinant protein which you want to purify by affinity chromatography. You have nickel columns available to purify the protein of your interest. Which molecule from the following will you choose to purify your protein?
- (A) GST
 - (B) Proline
 - (C) Histamine
 - (D) Histidine
265. Which one of the following statements is NOT correct for propagation and maintenance of mammalian cells in vitro?
- (A) The cells that are obtained directly from the organism is a primary culture
 - (B) HEPES buffer is generally used to maintain the pH of the culture media.
 - (C) Trypsin is added to cell culture media to maintain cell's health.
 - (D) Transformed cell lines do need external supply of serum to grow.
266. Among the following antigens specific to a pathogen, which one is most likely to be ineligible as a vaccine with long lasting host protective effect?
- (A) A signaling intermediate which is kinase
 - (B) A long chain fatty acid
 - (C) A cell surface protein
 - (D) An enzyme involved in pathogen metabolism

267. Which of the following is a MISMATCH between the plant drug and its source?
- (A) Codeine - *Papaver somniferum*
 - (B) Digitaline - *Artemisia annua***
 - (C) Vinblastine - *Catharanthus roseus*
 - (D) Quinine - *Cinchona ledgeriana*
268. Which of the following is NOT true for natural selection?
- (A) Natural selection is a non-random process
 - (B) Natural selection causes the biological traits to become more or less common in a population.
 - (C) Natural selection drives evolution
 - (D) Natural selection acts on inheritable phenotypic trait.**
269. The Haemoglobin has in general a molecular weight is,
- (A) 650 Daltons
 - (B) 6500 mg
 - (C) 65000 mg
 - (D) 65,000 Daltons**
270. In Electron microscopy normally, etching is conducted immediately after fracture at _____ for 60s in a vacuum.
- (A) -10°C
 - (B) -100°C**
 - (C) -50°C
 - (D) -30°C
271. MicroRNA genes are transcribed by,
- (A) RNA polymerase I and III
 - (B) RNA polymerase II and III**
 - (C) RNA polymerase I
 - (D) RNA polymerase I and II
272. In biology a mathematical model, typically of a sequence is known as,
- (A) Motif**
 - (B) Helix
 - (C) Domain
 - (D) Sensors
273. Colligative properties of solutions are properties,
- (A) That depend upon the concentration of solute molecules or ions,**
 - (B) That depends upon the identity of the solute.
 - (C) That depends upon the solvent.
 - (D) Depends upon B and C

274. Radioisotopes, help doctors diagnose thyroid disorders and metabolic disorders are,
(A) Iodine 123 and Iodine 125 (B) C12
(C) Cesium136 (D) Cobalt62
275. The Urea breath test is used to detect the presence of the,
(A) *E.coli*
(B) *Lactobacillus.sp*
(C) *Bacteria Helicobacter pylori in the stomach*
(D) *Fragilaria.sp*
276. Regulation and control of cell cycle is through the group of related protein known as,
(A) Glycoproteins (B) Haemoglobin
(C) Cyclins (D) Globulins
277. _____ carriers mediate transport of a single solute,
(A) Symport (B) Uniport
(C) Antiport (D) A And C both
278. It is a complex network of interlinking filaments and tubules that extend throughout the cytoplasm, from the nucleus to the plasma membrane.
(A) Exoskeleton (B) Vertebral column
(C) Cytoskeleton (D) Circulatory system
279. During vulva formation in *Caenorhabditis elegans*, which of the following proteins is secreted by anchor cell?
(A) LIN-31 (B) LIN-3
(C) Let23 (D) LIN-39
280. Species which are at a high risk of becoming vanished in the near future, if nothing is done to improve their situation.
(A) Extinct (B) Endangered
(C) Rare (D) Vulnerable

281. Grave's disease is caused by the over stimulation of,
(A) Cortex of kidney (B) Thyroid gland
(C) Medulla of testis (D) Adrenal gland
282. Rh factor was discovered by,
(A) Robert Hook
(B) Karl Landsteiner and Alexander S. Wiener.
(C) William Harvey
(D) James Watson
283. Frog oocytes do not swell in hypotonic saline because they lack of,
(A) Aquaporin (B) Potassium
(C) Chlorides (D) Sodium channels
284. Type of placenta is formed in human being,
(A) Haemoendothelial (B) Haemochorial
(C) Epitheliochorial (D) Endotheliochorial
285. The most popular and widely used engineered plasmid vector is,
(A) pBR322 (B) pUC
(C) pSC 101 (D) pUC 19
286. The cell organelles absent in neuron,
(A) ER (B) Centrioles
(C) Ribosomes (D) Nucleus
287. Difference between Queen and sterile worker bee is,
(A) The number of chromosome (B) Larval diet
(C) A single gene (D) Sex chromosome in worker
288. Gap junctions are absent in,
(A) Skeleton Muscles (B) Cardiac muscles
(C) Multi-unit smooth muscles (D) Smooth muscles

289. Temperature dependent sex determination is found in,
(A) Monotremata (B) Crocodiles
(C) Amphibian (D) Fishes
290. An epitoke is a,
(A) Terminal segment of a polychaete
(B) Juvenile of a polychaete
(C) Reproductive stage of a polychaete
(D) Non feeding stage of a polychaete
291. Following is a bacterial diseases,
(A) Leprosy (B) Polio
(C) Chicken pox (D) Malaria
292. Parasites which ultimately kill their hosts are called as,
(A) Parasitoids (B) Polyxenous parasites
(C) Monoxenous parasites (D) Definitive parasites
293. Dedifferentiation of cells is referred to as,
(A) Necrosis (B) Anaplasia
(C) Dysplasia (D) Atrophy
294. The following does not use trachea for gaseous exchange,
(A) Crab (B) Centipede
(C) Bee (D) Scorpion
295. Following organ does not control moulting in prawn,
(A) X-organ (B) Y-Organ
(C) Sinus gland (D) Corpora allata
296. Radial canals in sponges are,
(A) Evagination of body wall
(B) Invagination of body wall
(C) Connected to incurrent canals by apopyles
(D) Lined by archaeocytes

297. Highest salt concentration is found in,
(A) Renal pelvis (B) Medulla
(C) Cortex (D) Bowmen's capsule
298. The aortic arch has retained in the evolution of land vertebrates,
(A) Sixth (B) Fifth
(C) Second (D) First
299. Which of the following statements is true?
P. Exons are found in the same order in the genome
Q. All cells in human body have the same set of genes
R. All cells in human body express the same set of genes
S. All cells in the human body splice mRNAs for each gene in the same way
(A) R and S (B) Q and R
(C) P and Q (D) P and S
300. Class switching takes place in,
(A) Pro-B cells (B) Pre-B cells
(C) Immature B-cells (D) Activated B-cells