

193. Which of the following statements is not true ?
- (1) Flippers of penguins and dolphins are a pair of homologous organs
 - (2) Analogous structures are a result of convergent evolution
 - (3) Sweet potato and potato is an example of analogy
 - (4) Homology indicates common ancestry

194. Match List - I with List - II.

List - I

(Biological Molecules)

- (a) Glycogen
- (b) Globulin
- (c) Steroids
- (d) Thrombin

List - II

(Biological functions)

- (i) Hormone
- (ii) Biocatalyst
- (iii) Antibody
- (iv) Storage product

Choose the correct answer from the options given below:

- (1) (a) - (iv), (b) - (iii), (c) - (i), (d) - (ii)
 - (2) (a) - (iii), (b) - (ii), (c) - (iv), (d) - (i)
 - (3) (a) - (iv), (b) - (ii), (c) - (i), (d) - (iii)
 - (4) (a) - (ii), (b) - (iv), (c) - (iii), (d) - (i)
195. Which of the following are not the effects of Parathyroid hormone ?
- (a) Stimulates the process of bone resorption
 - (b) Decreases Ca^{2+} level in blood
 - (c) Reabsorption of Ca^{2+} by renal tubules
 - (d) Decreases the absorption of Ca^{2+} from digested food
 - (e) Increases metabolism of carbohydrates

Choose the most appropriate answer from the options given below :

- (1) (b) and (c) only
 - (2) (a) and (c) only
 - (3) (b), (d) and (e) only
 - (4) (a) and (e) only
196. Which one of the following statements is correct ?

- (1) Increased ventricular pressure causes closing of the semilunar valves.
- (2) The atrio-ventricular node (AVN) generates an action potential to stimulate atrial contraction
- (3) The tricuspid and the bicuspid valves open due to the pressure exerted by the simultaneous contraction of the atria
- (4) Blood moves freely from atrium to the ventricle during joint diastole.

197. Match List - I with List - II.

List - I

- (a) Bronchioles
- (b) Goblet cell
- (c) Tendons
- (d) Adipose Tissue

List - II

- (i) Dense Regular Connective Tissue
- (ii) Loose Connective Tissue
- (iii) Glandular Tissue
- (iv) Ciliated Epithelium

Choose the correct answer from the options given below :

- (1) (a) - (iii), (b) - (iv), (c) - (ii), (d) - (i)
- (2) (a) - (iv), (b) - (iii), (c) - (i), (d) - (ii)
- (3) (a) - (i), (b) - (ii), (c) - (iii), (d) - (iv)
- (4) (a) - (ii), (b) - (i), (c) - (iv), (d) - (iii)

198. If a colour blind female marries a man whose mother was also colour blind, what are the chances of her progeny having colour blindness ?

- (1) 100%
- (2) 25%
- (3) 50%
- (4) 75%

199. Which of the following is not a desirable feature of a cloning vector ?

- (1) Presence of two or more recognition sites
- (2) Presence of origin of replication
- (3) Presence of a marker gene
- (4) Presence of single restriction enzyme site

200. Ten *E. coli* cells with ^{15}N - dsDNA are incubated in medium containing ^{14}N nucleotide. After 60 minutes, how many *E. coli* cells will have DNA totally free from ^{15}N ?

- (1) 80 cells
- (2) 20 cells
- (3) 40 cells
- (4) 60 cells

Section - B (Biology : Zoology)

186. Match List - I with List - II with respect to methods of Contraception and their respective actions.

List - I	List - II
(a) Diaphragms	(i) Inhibit ovulation and Implantation
(b) Contraceptive Pills	(ii) Increase phagocytosis of sperm within Uterus
(c) Intra Uterine Devices	(iii) Absence of Menstrual cycle and ovulation following parturition
(d) Lactational Amenorrhoea	(iv) They cover the cervix blocking the entry of sperms

Choose the correct answer from the options given below :

- (1) (a) - (iii), (b) - (ii), (c) - (i), (d) - (iv)
 (2) (a) - (iv), (b) - (i), (c) - (iii), (d) - (ii)
 (3) (a) - (iv), (b) - (i), (c) - (ii), (d) - (iii)
 (4) (a) - (ii), (b) - (iv), (c) - (i), (d) - (iii)
187. The recombination frequency between the genes a & c is 5%, b & c is 15%, b & d is 9%, a & b is 20%, c & d is 24% and a & d is 29%. What will be the sequence of these genes on a linear chromosome ?
- (1) a, c, b, d
 (2) a, d, b, c
 (3) d, b, a, c
 (4) a, b, c, d

188. Select the incorrect statement with respect to acquired immunity.

- (1) Acquired immunity is non-specific type of defense present at the time of birth.
 (2) Primary response is produced when our body encounters a pathogen for the first time.
 (3) Anamnestic response is elicited on subsequent encounters with the same pathogen.
 (4) Anamnestic response is due to memory of first encounter.

189. Select the incorrect statement regarding synapses :

- (1) Impulse transmission across a chemical synapse is always faster than that across an electrical synapse.
 (2) The membranes of presynaptic and postsynaptic neurons are in close proximity in an electrical synapse.
 (3) Electrical current can flow directly from one neuron into the other across the electrical synapse.
 (4) Chemical synapses use neurotransmitters

190. Given below are two statements :

Statement I :

In a scrubber the exhaust from the thermal plant is passed through the electric wires to charge the dust particles.

Statement II :

Particulate matter (PM 2.5) can not be removed by scrubber but can be removed by an electrostatic precipitator.

In the light of the above statements, choose the most appropriate answer from the options given below :

- (1) Statement I is incorrect but Statement II is correct
 (2) Both Statement I and Statement II are correct
 (3) Both Statement I and Statement II are incorrect
 (4) Statement I is correct but Statement II is incorrect

191. Which of the following is a correct statement ?

- (1) Mycoplasma have DNA, Ribosome and cell wall
 (2) Cyanobacteria are a group of autotrophic organisms classified under Kingdom Monera.
 (3) Bacteria are exclusively heterotrophic organisms.
 (4) Slime moulds are saprophytic organisms classified under Kingdom Monera.

192. Statements related to human Insulin are given below. Which statement(s) is/are correct about genetically engineered Insulin ?

- (a) Pro-hormone insulin contain extra stretch of C-peptide
 (b) A-peptide and B-peptide chains of insulin were produced separately in *E.coli*, extracted and combined by creating disulphide bond between them.
 (c) Insulin used for treating Diabetes was extracted from Cattles and Pigs.
 (d) Pro-hormone Insulin needs to be processed for converting into a mature and functional hormone.
 (e) Some patients develop allergic reactions to the foreign insulin.

Choose the most appropriate answer from the options given below :

- (1) (c), (d) and (e) only
 (2) (a), (b) and (d) only
 (3) (b) only
 (4) (c) and (d) only

177. In an *E. coli* strain *i* gene gets mutated and its product can not bind the inducer molecule. If growth medium is provided with lactose, what will be the outcome?
- (1) RNA polymerase will bind the promoter region
 - (2) Only *z* gene will get transcribed
 - (3) *z, y, a* genes will be transcribed
 - (4) *z, y, a* genes will not be translated
178. Which of the following is present between the adjacent bones of the vertebral column?
- (1) Smooth muscle
 - (2) Intercalated discs
 - (3) Cartilage
 - (4) Areolar tissue
179. Which of the following statements are true for spermatogenesis but do not hold true for Oogenesis?
- (a) It results in the formation of haploid gametes
 - (b) Differentiation of gamete occurs after the completion of meiosis
 - (c) Meiosis occurs continuously in a mitotically dividing stem cell population
 - (d) It is controlled by the Luteinising hormone (LH) and Follicle Stimulating Hormone (FSH) secreted by the anterior pituitary
 - (e) It is initiated at puberty
- Choose the most appropriate answer from the options given below:
- (1) (b), (c) and (e) only
 - (2) (c) and (e) only
 - (3) (b) and (c) only
 - (4) (b), (d) and (e) only
180. At which stage of life the oogenesis process is initiated?
- (1) Adult
 - (2) Puberty
 - (3) Embryonic development stage
 - (4) Birth
181. Given below are two statements:
- Statement I:**
The release of sperms into the seminiferous tubules is called spermiation.
- Statement II:**
Spermiogenesis is the process of formation of sperms from spermatogonia.
- In the light of the above statements, choose the most appropriate answer from the options given below:
- (1) Statement I is incorrect but Statement II is correct
 - (2) Both Statement I and Statement II are correct
 - (3) Both Statement I and Statement II are incorrect
 - (4) Statement I is correct but Statement II is incorrect
182. Given below are two statements: one is labelled as Assertion (A) and the other is labelled as Reason (R).
- Assertion (A):**
All vertebrates are chordates but all chordates are not vertebrates.
- Reason (R):**
Notochord is replaced by vertebral column in the adult vertebrates.
- In the light of the above statements, choose the most appropriate answer from the options given below:
- (1) (A) is not correct but (R) is correct
 - (2) Both (A) and (R) are correct and (R) is the correct explanation of (A)
 - (3) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
 - (4) (A) is correct but (R) is not correct
183. *In-situ* conservation refers to:
- (1) Conserve only extinct species
 - (2) Protect and conserve the whole ecosystem
 - (3) Conserve only high risk species
 - (4) Conserve only endangered species
184. Select the incorrect statement with reference to mitosis:
- (1) Splitting of centromere occurs at anaphase.
 - (2) All the chromosomes lie at the equator at metaphase.
 - (3) Spindle fibres attach to centromere of chromosomes.
 - (4) Chromosomes decondense at telophase.
185. Given below are two statements:
- Statement I:**
Mycoplasma can pass through less than 1 micron filter size.
- Statement II:**
Mycoplasma are bacteria with cell wall
- In the light of the above statements, choose the most appropriate answer from the options given below:
- (1) Statement I is incorrect but Statement II is correct
 - (2) Both Statement I and Statement II are correct
 - (3) Both Statement I and Statement II are incorrect
 - (4) Statement I is correct but Statement II is incorrect

166. Under normal physiological conditions in human being every 100 ml of oxygenated blood can deliver _____ ml of O_2 to the tissues.

- (1) 10 ml
- (2) 2 ml
- ~~(3) 5 ml~~
- (4) 4 ml

167. Given below are two statements : one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A) :

Osteoporosis is characterised by decreased bone mass and increased chances of fractures.

Reason (R) :

Common cause of osteoporosis is increased levels of estrogen.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

- (1) (A) is not correct but (R) is correct
- (2) Both (A) and (R) are correct and (R) is the correct explanation of (A)
- (3) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- ~~(4) (A) is correct but (R) is not correct~~

168. Which of the following statements with respect to Endoplasmic Reticulum is **incorrect** ?

- (1) SER are the sites for lipid synthesis
- (2) RER has ribosomes attached to ER
- (3) SER is devoid of ribosomes
- ~~(4) In prokaryotes only RER are present~~

169. Given below are two statements :

Statement I :

Restriction endonucleases recognise specific sequence to cut DNA known as palindromic nucleotide sequence.

Statement II :

Restriction endonucleases cut the DNA strand a little away from the centre of the palindromic site.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

- (1) **Statement I** is incorrect but **Statement II** is correct
- ~~(2) Both **Statement I** and **Statement II** are correct~~
- (3) Both **Statement I** and **Statement II** are incorrect
- (4) **Statement I** is correct but **Statement II** is incorrect

170. Breeding crops with higher levels of vitamins and minerals or higher proteins and healthier fats is called :

- (1) Bio-accumulation
- (2) Bio-magnification
- (3) Bio-remediation
- ~~(4) Bio-fortification~~

171. If the length of a DNA molecule is 1.1 metres, what will be the approximate number of base pairs ?

- (1) 6.6×10^6 bp
- ~~(2) 3.3×10^9 bp~~
- (3) 6.6×10^9 bp
- (4) 3.3×10^6 bp

172. Regarding Meiosis, which of the statements is **incorrect** ?

- (1) Four haploid cells are formed at the end of Meiosis-II
- (2) There are two stages in Meiosis, Meiosis-I and II
- ~~(3) DNA replication occurs in S phase of Meiosis-II~~
- (4) Pairing of homologous chromosomes and recombination occurs in Meiosis-I

173. Natural selection where more individuals acquire specific character value other than the mean character value, leads to :

- (1) Random change
- ~~(2) Stabilising change~~
- (3) Directional change
- (4) Disruptive change

174. Lippe's loop is a type of contraceptive used as :

- ~~(1) Copper releasing IUD~~
- (2) Cervical barrier
- (3) Vault barrier
- (4) Non-Medicated IUD

175. Which of the following is **not** a connective tissue ?

- ~~(1) Neuroglia~~
- (2) Blood
- (3) Adipose tissue
- (4) Cartilage

176. Tegmina in cockroach, arises from :

- (1) Prothorax and Mesothorax
- ~~(2) Prothorax~~
- ~~(3) Mesothorax~~
- (4) Metathorax

55. In which of the following animals, digestive tract has additional chambers like crop and gizzard ?
- (1) Pavo, Psittacula, Corvus
 - (2) Corvus, Columba, Chameleon
 - (3) Bufo, Balaenoptera, Bangarus
 - (4) Catla, Columba, Crocodilus

56. If '8' *Drosophila* in a laboratory population of '80' died during a week, the death rate in the population is _____ individuals per *Drosophila* per week.
- (1) zero
 - (2) 0.1
 - (3) 10
 - (4) 1.0

157. Given below are two statements :
- Statement I :**
Autoimmune disorder is a condition where body defense mechanism recognizes its own cells as foreign bodies.
- Statement II :**
Rheumatoid arthritis is a condition where body does not attack self cells.
- In the light of the above statements, choose the most appropriate answer from the options given below :
- (1) Statement I is incorrect but Statement II is correct
 - (2) Both Statement I and Statement II are correct
 - (3) Both Statement I and Statement II are incorrect
 - (4) Statement I is correct but Statement II is incorrect

158. Which of the following functions is not performed by secretions from salivary glands ?
- (1) Digestion of disaccharides
 - (2) Control bacterial population in mouth
 - (3) Digestion of complex carbohydrates
 - (4) Lubrication of oral cavity

159. Nitrogenous waste is excreted in the form of pellet or paste by :
- (1) Pavo
 - (2) Ornithorhynchus
 - (3) Salamandra
 - (4) Hippocampus

160. A dehydration reaction links two glucose molecules to produce maltose. If the formula for glucose is $C_6H_{12}O_6$, then what is the formula for maltose ?
- (1) $C_{12}H_{24}O_{11}$
 - (2) $C_{12}H_{20}O_{10}$
 - (3) $C_{12}H_{24}O_{12}$
 - (4) $C_{12}H_{22}O_{11}$

161. Identify the asexual reproductive structure associated with *Penicillium* :
- (1) Buds
 - (2) Zoospores
 - (3) Conidia
 - (4) Gemmules

162. Given below are two statements :
- Statement I :**
The coagulum is formed of network of threads called thrombins.
- Statement II :**
Spleen is the graveyard of erythrocytes.
- In the light of the above statements, choose the most appropriate answer from the options given below :
- (1) Statement I is incorrect but Statement II is correct
 - (2) Both Statement I and Statement II are correct
 - (3) Both Statement I and Statement II are incorrect
 - (4) Statement I is correct but Statement II is incorrect

163. Detritivores breakdown detritus into smaller particles. This process is called :
- (1) Decomposition
 - (2) Catabolism
 - (3) Fragmentation
 - (4) Humification

164. Which of the following is a correct match for disease and its symptoms ?
- (1) Muscular dystrophy - An auto immune disorder causing progressive degeneration of skeletal muscle
 - (2) Arthritis - Inflamed joints
 - (3) Tetany - high Ca^{2+} level causing rapid spasms.
 - (4) Myasthenia gravis - Genetic disorder resulting in weakening and paralysis of skeletal muscle

165. Which of the following is not the function of conducting part of respiratory system ?
- (1) Provides surface for diffusion of O_2 and CO_2
 - (2) It clears inhaled air from foreign particles
 - (3) Inhaled air is humidified
 - (4) Temperature of inhaled air is brought to body temperature

139. Match List - I with List - II.

- | List - I | List - II |
|----------------------------|---|
| (a) Metacentric chromosome | (i) Centromere situated close to the end forming one extremely short and one very long arms |
| (b) Acrocentric chromosome | (ii) Centromere at the terminal end |
| (c) Sub-metacentric | (iii) Centromere in the middle forming two equal arms of chromosomes |
| (d) Telocentric chromosome | (iv) Centromere slightly away from the middle forming one shorter arm and one longer arm |

Choose the correct answer from the options given below :

- (1) (a) - (i), (b) - (ii), (c) - (iii), (d) - (iv)
~~(2) (a) - (iii), (b) - (i), (c) - (iv), (d) - (ii)~~
 (3) (a) - (i), (b) - (iii), (c) - (ii), (d) - (iv)
 (4) (a) - (ii), (b) - (iii), (c) - (iv), (d) - (i)
140. If a geneticist uses the blind approach for sequencing the whole genome of an organism, followed by assignment of function to different segments, the methodology adopted by him is called as :
- (1) Bioinformatics
~~(2) Sequence annotation~~
 (3) Gene mapping
 (4) Expressed sequence tags
141. In the following palindromic base sequences of DNA, which one can be cut easily by particular restriction enzyme ?
- (1) 5' GTATTC 3' ; 3' CATAAG 5'
 (2) 5' GATACT 3' ; 3' CTATGA 5'
~~(3) 5' GAATTC 3' ; 3' CTTAAG 5'~~
 (4) 5' CTCAGT 3' ; 3' GAGTCA 5'
142. While explaining interspecific interaction of population, (+) sign is assigned for beneficial interaction, (-) sign is assigned for detrimental interaction and (0) for neutral interaction. Which of the following interactions can be assigned (+) for one species and (-) for another species involved in the interaction ?
- (1) Competition
~~(2) Predation~~
 (3) Amensalism
 (4) Commensalism

143. Which one of the following will accelerate phosphorus cycle ?

- (1) Rain fall and storms
 (2) Burning of fossil fuels
 (3) Volcanic activity
~~(4) Weathering of rocks~~

144. Which of the following occurs due to the presence of autosome linked dominant trait ?

- (1) Thalessemia
 (2) Sickle cell anaemia
 (3) Myotonic dystrophy
 (4) Haemophilia

145. The anatomy of springwood shows some peculiar features. Identify the correct set of statements about springwood.

- (a) It is also called as the earlywood
 (b) In spring season cambium produces xylem elements with narrow vessels
 (c) It is lighter in colour
 (d) The springwood along with autumnwood shows alternate concentric rings forming annual rings
 (e) It has lower density

Choose the correct answer from the options given below :

- (1) (c), (d) and (e) Only
 (2) (a), (b), (d) and (e) Only
~~(3) (a), (c), (d) and (e) Only~~
 (4) (a), (b) and (d) Only

146. Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A) :

Mendel's law of Independent assortment does not hold good for the genes that are located closely on the same chromosome.

Reason (R) :

Closely located genes assort independently.

In the light of the above statements, choose the correct answer from the options given below :

- (1) (A) is not correct but (R) is correct
 (2) Both (A) and (R) are correct and (R) is the correct explanation of (A)
 (3) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
~~(4) (A) is correct but (R) is not correct~~

R1

130. The process of translation of mRNA to proteins begins as soon as :
- (1) The tRNA is activated and the larger subunit of ribosome encounters mRNA
 - (2) The small subunit of ribosome encounters mRNA
 - (3) The larger subunit of ribosome encounters mRNA
 - (4) Both the subunits join together to bind with mRNA
131. Which one of the following produces nitrogen fixing nodules on the roots of *Alnus* ?
- (1) *Beijernickia*
 - (2) *Rhizobium*
 - (3) *Frankia*
 - (4) *Rhodospirillum*
132. The gaseous plant growth regulator is used in plants to :
- (1) kill dicotyledonous weeds in the fields
 - (2) speed up the malting process
 - (3) promote root growth and root hair formation to increase the absorption surface
 - (4) help overcome apical dominance
133. Hydrocolloid carrageen is obtained from :
- (1) Phaeophyceae only
 - (2) Chlorophyceae and Phaeophyceae
 - (3) Phaeophyceae and Rhodophyceae
 - (4) Rhodophyceae only
134. Exoskeleton of arthropods is composed of :
- (1) Glucosamine
 - (2) Cutin
 - (3) Cellulose
 - (4) Chitin
135. Which one of the following plants shows vexillary aestivation and diadelphous stamens ?
- (1) *Solanum nigrum*
 - (2) *Colchicum autumnale*
 - (3) *Pisum sativum*
 - (4) *Allium cepa*
136. The entire fleet of buses in Delhi were converted to CNG from diesel. In reference to this, which one of the following statements is false ?
- (1) It can not be adulterated like diesel
 - (2) CNG burns more efficiently than diesel
 - (3) The same diesel engine is used in CNG buses making the cost of conversion low
 - (4) It is cheaper than diesel
137. What is the role of large bundle sheath cells found around the vascular bundles in C_4 plants ?
- (1) To protect the vascular tissue from high light intensity
 - (2) To provide the site for photorespiratory pathway
 - (3) To increase the number of chloroplast for the operation of Calvin cycle
 - (4) To enable the plant to tolerate high temperature
138. Read the following statements on lipids and find out correct set of statements :
- (a) Lecithin found in the plasma membrane is a glycolipid
 - (b) Saturated fatty acids possess one or more $c = c$ bonds
 - (c) Gingely oil has lower melting point, hence remains as oil in winter
 - (d) Lipids are generally insoluble in water but soluble in some organic solvents
 - (e) When fatty acid is esterified with glycerol, monoglycerides are formed
- Choose the correct answer from the options given below :
- (1) (a), (b) and (d) only
 - (2) (a), (b) and (c) only
 - (3) (a), (d) and (e) only
 - (4) (c), (d) and (e) only

122. Read the following statements and choose the set of correct statements :

- (a) Euchromatin is loosely packed chromatin
- (b) Heterochromatin is transcriptionally active
- (c) Histone octamer is wrapped by negatively charged DNA in nucleosome
- (d) Histones are rich in lysine and arginine
- (e) A typical nucleosome contains 400 bp of DNA helix

Choose the correct answer from the options given below :

- (1) (a), (c), (e) Only
- (2) (b), (d), (e) Only
- (3) (a), (c), (d) Only
- (4) (b), (e) Only

123. Read the following statements about the vascular bundles :

- (a) In roots, xylem and phloem in a vascular bundle are arranged in an alternate manner along the different radii.
- (b) Conjoint closed vascular bundles do not possess cambium
- (c) In open vascular bundles, cambium is present in between xylem and phloem
- (d) The vascular bundles of dicotyledonous stem possess endarch protoxylem
- (e) In monocotyledonous root, usually there are more than six xylem bundles present

Choose the correct answer from the options given below :

- (1) (a), (c), (d) and (e) Only
- (2) (a), (b) and (d) Only
- (3) (b), (c), (d) and (e) Only
- (4) (a), (b), (c) and (d) Only

124. "Girdling Experiment" was performed by Plant Physiologists to identify the plant tissue through which :

- (1) osmosis is observed
- (2) water is transported
- (3) food is transported
- (4) for both water and food transportation

125. Which one of the following is not true regarding the release of energy during ATP synthesis through chemiosmosis ? It involves :

- (1) Reduction of NADP to NADPH₂ on the stroma side of the membrane
- (2) Breakdown of proton gradient
- (3) Breakdown of electron gradient
- (4) Movement of protons across the membrane to the stroma

126. Given below are two statements :

Statement I :

Mendel studied seven pairs of contrasting traits in pea plants and proposed the Laws of Inheritance

Statement II :

Seven characters examined by Mendel in his experiment on pea plants were seed shape and colour, flower colour, pod shape and colour, flower position and stem height

In the light of the above statements, choose the correct answer from the options given below :

- (1) **Statement I** is incorrect but **Statement II** is correct
- (2) Both **Statement I** and **Statement II** are correct
- (3) Both **Statement I** and **Statement II** are incorrect
- (4) **Statement I** is correct but **Statement II** is incorrect

127. Match List - I with List - II.

List - I

List - II

- | | |
|---------------|--|
| (a) Manganese | (i) Activates the enzyme catalase |
| (b) Magnesium | (ii) Required for pollen germination |
| (c) Boron | (iii) Activates enzymes of respiration |
| (d) Iron | (iv) Functions in splitting of water during photosynthesis |

Choose the correct answer from the options given below :

- (1) (a) - (iii), (b) - (i), (c) - (ii), (d) - (iv)
- (2) (a) - (iii), (b) - (iv), (c) - (i), (d) - (ii)
- (3) (a) - (iv), (b) - (iii), (c) - (ii), (d) - (i)
- (4) (a) - (iv), (b) - (i), (c) - (ii), (d) - (iii)

128. The appearance of recombination nodules on homologous chromosomes during meiosis characterizes :

- (1) Terminalization
- (2) Synaptonemal complex
- (3) Bivalent
- (4) Sites at which crossing over occurs

129. Which of the following is not observed during apoplastic pathway ?

- (1) Apoplast is continuous and does not provide any barrier to water movement.
- (2) Movement of water occurs through intercellular spaces and wall of the cells.
- (3) The movement does not involve crossing of cell membrane
- (4) The movement is aided by cytoplasmic streaming

R1

115. Production of Cucumber has increased manifold in recent years. Application of which of the following phytohormones has resulted in this increased yield as the hormone is known to produce female flowers in the plants :

- (1) Cytokinin
- (2) ABA
- (3) Gibberellin
- (4) Ethylene

116. The flowers are Zygomorphic in :

- (a) Mustard
- (b) Gulmohar
- (c) Cassia
- (d) Datura
- (e) Chilly

Choose the correct answer from the options given below :

- (1) (c), (d), (e) Only
- (2) (a), (b), (c) Only
- (3) (b), (c) Only
- (4) (d), (e) Only

117. Which one of the following never occurs during mitotic cell division ?

- (1) Coiling and condensation of the chromatids
- (2) Spindle fibres attach to kinetochores of chromosomes
- (3) Movement of centrioles towards opposite poles
- (4) Pairing of homologous chromosomes

118. Given below are two statements :

Statement I :

Cleistogamous flowers are invariably autogamous

Statement II :

Cleistogamy is disadvantageous as there is no chance for cross pollination

In the light of the above statements, choose the correct answer from the options given below :

- (1) Statement I is incorrect but Statement II is correct
- (2) Both Statement I and Statement II are correct
- (3) Both Statement I and Statement II are incorrect
- (4) Statement I is correct but Statement II is incorrect

119. Habitat loss and fragmentation, over exploitation, alien species invasion and co-extinction are causes for :

- (1) Natality
- (2) Population explosion
- (3) Competition
- (4) Biodiversity loss

120. Given below are two statements :

Statement I :

Decomposition is a process in which the detritus is degraded into simpler substances by microbes.

Statement II :

Decomposition is faster if the detritus is rich in lignin and chitin

In the light of the above statements, choose the correct answer from the options given below :

- (1) Statement I is incorrect but Statement II is correct
- (2) Both Statement I and Statement II are correct
- (3) Both Statement I and Statement II are incorrect
- (4) Statement I is correct but Statement II is incorrect

121. Given below are two statements :

Statement I :

The primary CO_2 acceptor in C_4 plants is phosphoenolpyruvate and is found in the mesophyll cells.

Statement II :

Mesophyll cells of C_4 plants lack RuBisCo enzyme.

In the light of the above statements, choose the correct answer from the options given below :

- (1) Statement I is incorrect but Statement II is correct
- (2) Both Statement I and Statement II are correct
- (3) Both Statement I and Statement II are incorrect
- (4) Statement I is correct but Statement II is incorrect

107. The device which can remove particulate matter present in the exhaust from a thermal power plant is :

- (1) Catalytic Converter
- (2) STP
- (3) Incinerator
- (4) Electrostatic Precipitator

108. Identify the correct set of statements :

- (a) The leaflets are modified into pointed hard thorns in *Citrus* and *Bougainvillea*
- (b) Axillary buds form slender and spirally coiled tendrils in cucumber and pumpkin
- (c) Stem is flattened and fleshy in *Opuntia* and modified to perform the function of leaves
- (d) *Rhizophora* shows vertically upward growing roots that help to get oxygen for respiration
- (e) Subaerially growing stems in grasses and strawberry help in vegetative propagation

Choose the correct answer from the options given below :

- (1) (a), (b), (d) and (e) Only
- (2) (b) and (c) Only
- (3) (a) and (d) Only
- (4) (b), (c), (d) and (e) Only

109. What is the net gain of ATP when each molecule of glucose is converted to two molecules of pyruvic acid ?

- (1) Eight
- (2) Four
- (3) Six
- (4) Two

110. What amount of energy is released from glucose during lactic acid fermentation ?

- (1) Less than 7%
- (2) Approximately 15%
- (3) More than 18%
- (4) About 10%

111. Given below are two statements : one is labelled as Assertion (A) and the other is labelled as Reason (R).

Assertion (A):

Polymerase chain reaction is used in DNA amplification

Reason (R):

The ampicillin resistant gene is used as a selectable marker to check transformation

In the light of the above statements, choose the correct answer from the options given below :

- (1) (A) is not correct but (R) is correct
- (2) Both (A) and (R) are correct and (R) is the correct explanation of (A)
- (3) Both (A) and (R) are correct but (R) is not the correct explanation of (A)
- (4) (A) is correct but (R) is not correct

112. In old trees the greater part of secondary xylem is dark brown and resistant to insect attack due to :

- (a) secretion of secondary metabolites and their deposition in the lumen of vessels.
- (b) deposition of organic compounds like tannins and resins in the central layers of stem.
- (c) deposition of suberin and aromatic substances in the outer layer of stem.
- (d) deposition of tannins, gum, resin and aromatic substances in the peripheral layers of stem.
- (e) presence of parenchyma cells, functionally active xylem elements and essential oils.

Choose the correct answer from the options given below :

- (1) (b) and (d) Only
- (2) (a) and (b) Only
- (3) (c) and (d) Only
- (4) (d) and (e) Only

113. DNA polymorphism forms the basis of :

- (1) Translation
- (2) Genetic mapping
- (3) DNA finger printing
- (4) Both genetic mapping and DNA finger printing

114. Identify the incorrect statement related to Pollination :

- (1) Moths and butterflies are the most dominant pollinating agents among insects
- (2) Pollination by water is quite rare in flowering plants
- (3) Pollination by wind is more common amongs abiotic pollination
- (4) Flowers produce foul odours to attract flies and beetles to get pollinated

Section - A (Biology : Botany)

101. Which of the following is not a method of *ex situ* conservation ?
- (1) Cryopreservation
 - (2) *In vitro* fertilization
 - (3) National Parks
 - (4) Micropropagation
102. Which one of the following statement is not true regarding gel electrophoresis technique ?
- (1) Bright orange coloured bands of DNA can be observed in the gel when exposed to UV light.
 - (2) The process of extraction of separated DNA strands from gel is called elution.
 - (3) The separated DNA fragments are stained by using ethidium bromide.
 - (4) The presence of chromogenic substrate gives blue coloured DNA bands on the gel.
103. Which one of the following statements cannot be connected to Predation ?
- (1) It is necessitated by nature to maintain the ecological balance
 - (2) It helps in maintaining species diversity in a community
 - (3) It might lead to extinction of a species
 - (4) Both the interacting species are negatively impacted
104. Which of the following is incorrectly matched ?
- (1) *Volvox* - Starch
 - (2) *Ectocarpus* - Fucoxanthin
 - (3) *Ullothrix* - Mannitol
 - (4) *Porphyra* - Floridian Starch
105. Which one of the following plants does not show plasticity ?
- (1) Maize
 - (2) Cotton
 - (3) Coriander
 - (4) Buttercup
106. XO type of sex determination can be found in :
- (1) Monkeys
 - (2) *Drosophila*
 - (3) Birds
 - (4) Grasshoppers