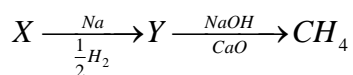


89. What is 'X' in the following sequence of reaction?



- 1) Methanol 2) Methanoic acid 3) Ethanoic acid 4) Methanal
90. Arrange the following alkenes in the descending order of their reactivity with HBr
- a) ethene b) propene c) 2-Butene d) 2-methyl-2-Butene
- 1) a>b>c>d 2) d>c>b>a 3) d>c>a>b 4) a>b>d>c

BIOLOGY

91. Which of the following statements is wrong w.r.t. rules of nomenclature?

- 1) The first word denoting the genus starts with a capital letter
 2) The specific epithet starts with a small letter
 3) Biological names are printed in italics to indicate their latin origin
 4) In the biological name – *Mangifera indica L.*, 'L' denotes the word 'Latin'

92. Amphibia belongs to division

- 1) Tetrapoda 2) Pisces 3) Agnatha 4) Gnathostomata

93. A suitable vector must have :

- 1) more than one ori for replication
 2) many restriction sites of a restriction endonuclease
 3) selectable marker genes for identification
 4) all of the above

94. In flatworms specialized cells are help in osmoregulation and excretion are

- 1) Renetti cells 2) Flame cells
 3) Nephridia 4) Cholorogogen cells

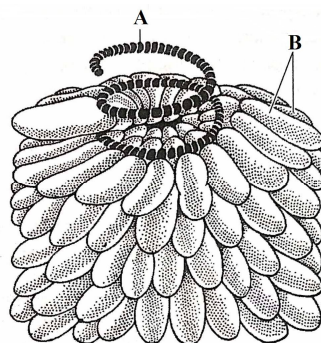
95. The parasitic fungi on mustard is

- 1) *Albugo* 2) *Rhizopus* 3) *Mucor* 4) *Agaricus*

96. Which connective tissue support frame work for epithelium

- 1) Areolar tissue 2) Adipose tissue
 3) Dense connective tissue 4) Specialized connective tissue

97. Identify the virus and name the structures A and B



- 1) TMV, A=ssRNA, B=capsid 2) TMV, A=dsRNA, B=capsid
 3) TMV, A=capsid, B=ssRNA 4) TMV, A=capsid, B=dsRNA

98. In cockroach blood vessels are purely developed and open into

- 1) Spongocoel 2) Spinal neurocoel 3) Blastocoel 4) Haemocoel

99. The artificial system of classification gives equal weightage to vegetative and sexual characters. This is not acceptable as

- 1) Sexual characters are more easily affected by the environment than vegetative characters
 2) Vegetative characters are more easily affected by the environment than sexual characters
 3) Both vegetative and sexual characters are equally affected by the environment
 4) Neither vegetative nor sexual characters are affected by the environment

110. Find out correct match

	PO₂ (In mm Hg)	PCO₂ (In mm Hg)
Atmospheric air	a	b
Alveoli	c	40
Deoxygenated blood	40	d
Oxygenated blood	e	40
Tissue	f	45

- 1) a-104, b-40, c-95, d-45, e-45, f-40 2) a-159, b-40, c-104, d-45, e-95, f-40
 3) a-159, b-45, c-104, d-95, e-40, f-45 4) a-159, b-0.3, c-104, d-45, e-95, f-40

111. Which of the following statements are correct for sap wood?

- i) It does not help in water conduction**
ii) It is light coloured
iii) It is also called alburnum
iv) Its tracheary elements are filled with tannins, resins, oils, gums aromatic compounds and essential oils
v) It is hard and durable

- 1) ii, iii 2) i, ii, iii 3) iv, v 4) iii, iv, v

112. Thrombocytes are cell fragments produced from specialized cells in bone marrow are called

- 1) Myeloblasts 2) Choanocytes
 3) Megakaryocytes 4) Sclerocytes

113. According to the Jacob-Monod (lac operon) model of gene regulation, inducer substances in bacterial cells probably:

- 1) combine with operator regions, activating the associated operons
 2) combine with structural genes, stimulating them to synthesize messenger RNA
 3) combine with repressor proteins, inactivating them
 4) combine with promoter regions, activating RNA Polymerase

114. Closure of tricuspid and bicuspid valves due to

- 1) Ventricular pressure decrease 2) Ventricular pressure increase
 3) Atrial pressure increase 4) 2 and 3

115. Mitochondria and chloroplast are

- A) Semi-autonomous organelles**
B) Formed by division of pre-existing organelles and they contain DNA but lack protein synthesis machinery

Which of the following options is correct?

- 1) Both (A) and (B) are correct 2) (B) is true but (A) is false
 3) (A) is true but (B) is false 4) Both (A) and (B) are false

116. Conditional reabsorption of Na⁺, H₂O takes place in the part of nephron is

- 1) PCT 2) Henle's loop 3) DCT 4) Collecting duct

117. Consider the following four statements (1-4) and select the options which includes all the correct ones only :

- a) Transforming principle explained by Griffith was later identified as DNA.
 b) Histones are rich in acidic amino acids lysine and arginine.
 c) In RNA, every nucleotide has — OH group present at 2-position of ribose.
 d) In a dsDNA the two = chains have antiparallel polarity.

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

118. Dialysing unit (artificial kidney) contains fluid which is almost same as plasma except that it has

- 1) High glucose 2) High urea 3) No urea 4) High uric acid

119. A segment of dsDNA has 120 adenine and 120 cytosine bases. The total number of nucleotides present in the segment is

- 1) 120 2) 480 3) 60 4) 240

120. Following statements related to contractile proteins

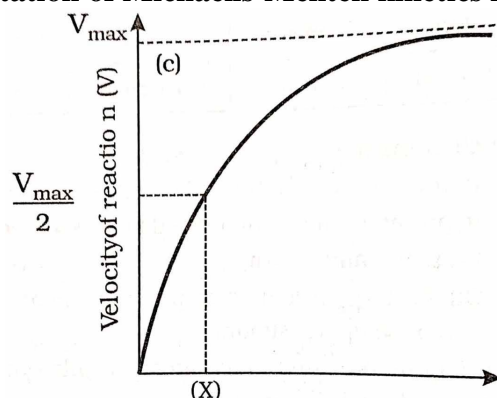
I) Actin is a polymer of monomeric G-actins

II) Meromyosin has globular head with short arm and tail

III) Myosin is monomeric protein with meromyosins

- 1) I, II are correct 2) II, III are correct
3) I, III are correct 4) I, II, III are correct

121. In the graphical representation of Michaelis-Menten kinetics X represents



- 1) Concentration of active mass of the substrate at which the rate of reaction is $\frac{1}{2}V_{\max}$
2) Concentration of enzyme substrate complex at which the rate of reaction is $\frac{1}{2}V_{\max}$
3) Concentration of product at which the rate of reaction is V_{\max}
4) Concentration of enzyme at which the rate of reaction is $\frac{1}{2}V_{\max}$

122. Identify the odd one w.r.t for skeletal system

- 1) Patella – ventrally covers knee
2) Pubic symphysis – ventrally by fibrous cartilage
3) Scapula – Dorsally triangular flat bone
4) Ribs – ventrally attached to thoracic vertebrae

123. Test cross does not involve :

- (A) crossing between two genotypes with dominant trait.
(B) crossing between two genotypes with recessive trait.
(C) crossing the F_1 hybrid with double recessive genotype.
(D) crossing between two F_1 hybrids.

- 1) A, B and D 2) A, B, C and D 3) B, C and D 4) A, B and C

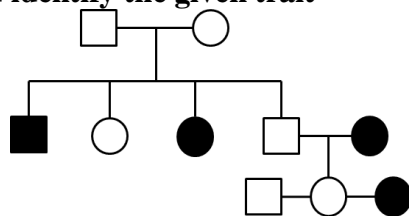
124. Sterile female with abnormally in XO condition found in

- 1) Turner's syndrome 2) Marfan's syndrome
3) Klinefelter's syndrome 4) Cri-du-chat syndrome

125. Terminalisation starts during

- 1) Diplotene 2) Pachytene 3) Leptotene 4) Zygotene

126. Study the given pedigree and identify the given trait



- 1) Autosomal dominant 2) X-linked dominant 3) Autosomal recessive 4) X-linked recessive

127. Inter flowering period, is' the period between two successive flowering phases. This inter flowering period is present in which of the following?

- 1) Wheat and rice 2) Strobilanthus and Bambusa species
3) Mango and apple 4) Radish and carrot

128. Heterogametic male is found in all except

- 1) Mammals 2) Drosophila 3) Birds 4) Grasshopper

129. Which one is possible for a fully turgid cell?

- 1) DPD=10 atm, OP=15 atm, TP=5 atm 2) DPD=0.2 atm, OP=0.7 atm, TP=0.5 atm
3) DPD=5 atm, OP=7 atm, TP= 2 atm 4) DPD=0.0 atm, OP=15 atm, TP=15 atm

130. In DNA finger printing, gel-electrophoresis is used for

- 1) Separation of DNA fragment 2) Digestion of DNA fragment
3) Detection of hybridized DNA segment 4) Transfer of DNA fragments

131. Select the incorrect match

- 1) Free living bacteria – *Azotobacter* 2) Symbiotic cyanobacteria – *Nostoc*
3) Symbiotic prokaryote – *Frankia* 4) Symbiotic cyanobacteria – *Azolla*

132. Which of the following genes is defective in patient suffering from SCID

- 1) Tyrosinase 2) Adenosine deaminase
3) Homogentisic oxidase 4) Galactosidase

133. Match the column

Column-I

- A) Alcohol dehydrogenase
B) Opening and closing of stomata
C) PEP-case and RuBisCO
D) stabilization of protein structure

- 1) A-i, B-iv, C-ii, D-iii
3) A-iii, B-ii, C-iv, D-i

Column-II

- i) Magnesium
ii) Potassium
iii) Sulphur
iv) Zinc

- 2) A-i, B-ii, C-iii, D-iv
4) A-iv, B-ii, C-i, D-iii

134. Which of the following cells will undergo the second meiotic division

- 1) Primary spermatocytes 2) Spermatids
3) Secondary spermatocytes 4) Spermatogonia

135. To synthesize one molecule of glucose the requirements of $\text{CO}_2 : \text{ATP} : \text{NADPH} + \text{H}^+$ in C_3 plants and C_4 plants are

	C_3 Plant $\text{CO}_2 : \text{ATP} : \text{NADPH} + \text{H}^+$	C_4 Plant $\text{CO}_2 : \text{ATP} : \text{NADPH} + \text{H}^+$
1)	6 : 30 : 12	6 : 18 : 12
2)	1 : 5 : 2	1 : 3 : 2
3)	6 : 18 : 12	6 : 30 : 12
4)	1 : 3 : 2	1 : 5 : 2

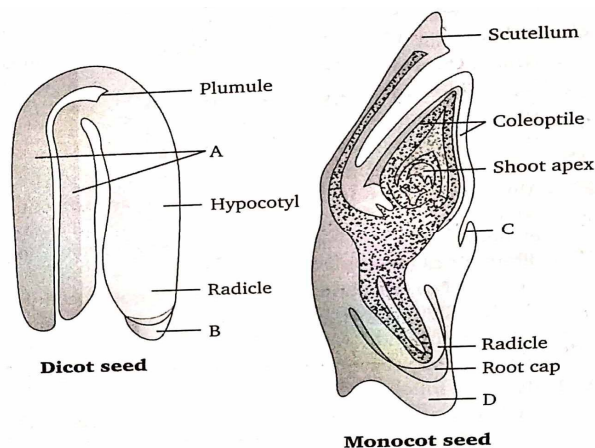
136. Formating of animals within the same breed but having no common ancestors on either side of their pedigree upto 4-6 generations is called

- 1) Cross breeding 2) In breeding
3) Out crossing 4) Interspecific hybridisation

137. The primary acceptor of CO_2 in C_3 cycle and C_4 cycle are respectively

- 1) RuBP and PEP 2) PEP and RuBP 3) 3-PGA and PEP 4) RuBP and 3-PGA

146. The centres for hunger, thirst, satiety and temperature control are present in
 1) Epithalamus 2) Hypothalamus
 3) Thalamus 4) Mid brain
147. The male gametes of rice plant have 12 chromosomes in their nucleus. The chromosome number in the female gamete, zygote and the cells of the seedling will be respectively
 1) 12, 24, 12 2) 24, 12, 12
 3) 12, 24, 24 4) 24, 12, 24
148. Which of the following is secreted by anterior pituitary which promotes releases of adrenal cortex hormones?
 1) MSH 2) ACTH 3) Prolactin 4) LH
149. Which is wrongly matched
 1) Agave – Bubils 2) *Penicillium* – Conidia
 3) Water Hyacinth – Runner 4) *Bryophyllum* – Leaf buds
150. A-diseases which is due to hyperthyroidism, characterized by enlargement of thyroid gland, protrusion of eye ball, increases BMR and weight loss is called
 1) Exophthalmic goitre 2) Simple goitre 3) Grave's disease 4) Both 1 and 3
151. Which is right sequence of hydrosere?
 1) Phytoplankton → Rooted submerged plants → Rooted floating plants → Reed swamp
 2) Phytoplankton → Rooted floating plants → Rooted submerged plants → Reed swamp
 3) Phytoplankton → Reed swamp → Rooted submerged plants → Rooted floating plants
 4) Reed swamp → Phytoplankton → Rooted submerged plants → Floating plants
152. Seminal plasma is not contributed by
 1) Prostate gland 2) Seminal vesicle
 3) Bulbourethral gland 4) Bartholin gland
153. Which of the following bryophyte was used in trans-shipment as packing material?
 1) Marchantia 2) Sphagnum
 3) Funaria 4) Polytrichum
154. Menarche is the state when
 1) First parturition takes place 2) First hymen break occurs
 3) First ejaculation of semen takes place 4) First menstrual cycle occurs
155. Identify the structures marked as A, B, C, D in the diagrams of dicot and monocot seeds given below



- 1) A=Cotyledons, B=Epiblast, C=Root cap, D=Coleoptile
 2) A=Cotyledons, B= Root cap, C= Epiblast, D= Coleorrhiza
 3) A= Epiblast, B=Coleorrhiza, C= Coleoptile, D= Cotyledons
 4) A=Cotyledons, B= Coleorrhiza, C=Root cap, D= Epiblast

156. Match the following

- | | |
|---------------|------------------------|
| I) IUD's | A) Lippes loop |
| II) Vasectomy | B) Males |
| III) Saheli | C) Oral contraceptives |
| IV) Vaults | D) Physical barrier |

- | | A | B | C | D |
|----|-----|-----|-----|----|
| 1) | I | III | II | IV |
| 2) | III | IV | II | I |
| 3) | I | II | III | IV |
| 4) | I | IV | III | II |

- 157. (a) Universal cell organelle. (b) Composed of ribonucleic acid and protein.
(c) Engine of cell. (d) Mg²⁺ is essential for their subunit association.**

Above statements are related with which of the following organelles/structures?

- | | | | |
|--------------|-----------------|-------------|------------|
| 1) Nucleolus | 2) Mitochondria | 3) Ribosome | 4) Nucleus |
|--------------|-----------------|-------------|------------|

- 158. If a person is suffering from severe male infertility due to very low sperm count, then it can be treated by**

- | | | | |
|---------|--------|-------|---------|
| 1) GIFT | 2) IUF | 3) AI | 4) ZIFT |
|---------|--------|-------|---------|

- 159. How many unique gametes could be produced through the independent assortment by an individual with the genotype AaBBccDdee?**

- | | | | |
|------|------|------|-------|
| 1) 8 | 2) 4 | 3) 2 | 4) 16 |
|------|------|------|-------|

- 160. In which more individuals acquire mean character value in**

- | | |
|--------------------------|--------------------------|
| 1) Stabilising selection | 2) Directional selection |
| 3) Disruptive selection | 4) Centrifugal selection |

- 161. How many types of genotypes and phenotypes respectively are possible in the ABO-blood group system in human beings?**

- | | | | |
|---------|---------|---------|---------|
| 1) 4, 6 | 2) 6, 4 | 3) 3, 2 | 4) 2, 3 |
|---------|---------|---------|---------|

- 162. Which one is most widely used for removal of over 99% particulate matter present in the exhaust from a thermal power plant**

- | | |
|-------------------------------|------------------------|
| 1) Scrubber | 2) Catalytic converter |
| 3) Electrostatic precipitator | 4) Green muffling |

- 163. Which of the following is incorrect?**

- (A) The petioles in Australian Acacia expands, become green and synthesis food.
 (B) Pattern of arrangement of leaves on stem is opposite in sunflower and Alstonia.
 (C) When a shoot tip transforms into a flower, it is always solitary.
 (D) Ovules are borne on central axis and septa are absent in Dianthus and Primrose.
 (E) In Solanaceae, gynoecium is bicarpellary syncarpous, ovary is superior and placenta are swollen with many ovules.

- | | | | |
|------------|-----------|---------------|-----------|
| 1) A and G | 2) B only | 3) A, C and D | 4) E only |
|------------|-----------|---------------|-----------|

- 164. Statement-I:** Increase in the concentration of toxicant in the living organisms Oat successive trophic levels is called biomagnification

Statement-II: Biomagnification is well known for DDT and mercury

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

- 165. The main/prevaling/predominating form in life cycle of Pteridophyta is:**

- | | | | |
|----------------|---------------|------------|-----------|
| 1) gametophyte | 2) sporophyte | 3) gametes | 4) spores |
|----------------|---------------|------------|-----------|

- 166. How many are associated with ex-situ conservation national parks, seed banks, zoological parks, wild life sanctuary, wild life safari parks, sacred groove botanical gardens**

- | | | | |
|------|------|------|------|
| 1) 4 | 2) 5 | 3) 6 | 4) 3 |
|------|------|------|------|

167. Match the following columns:

Column-I

- A) $\phi \times 174$ DNA
- B) λ - phage DNA
- C) *E. coli* DNA
- D) Haploid content of human DNA

Column-II

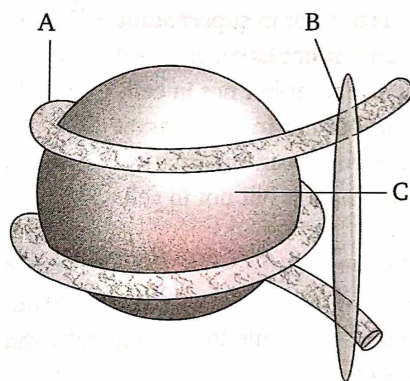
- i) 3.3×10^9 bp
- ii) 4.6×10^6 bp
- iii) 48502 bp
- iv) 5386 bases

- 1) A-iv, B-iii, C-ii, D-i
- 3) A-ii, B-iii, C-iv, D-i

168. A stable community shows

- 1) Should not show too-much variation in productive from year to year
- 2) Should not be resilient to occasional disturbances
- 3) Should not be resistant to alien species invasion
- 4) Increased diversity contribute to lesser productivity

169. Identify A, B and C of nucleosome:



- 1) A=Histone core, B=DNA, C=H1
- 2) A=DNA, B=Histone octamer, C=H1
- 3) A=DNA, B=H1, C=Histone octamer
- 4) A=DNA, B= Histone core, C=H1

170. Which of the following climatic factors inhibit decomposition of detritus

- A) Low temperature
- B) Warm condition
- C) Aerobic condition
- D) Anaerobic condition

- 1) A C
- 2) A D
- 3) A B
- 4) A B C D

171. If Meselson and Stahl's experiment is continued for four generations in bacteria, the ratio of $^{15}_N/^{15}_N : ^{15}_N/^{14}_N : ^{14}_N/^{14}_N$ containing DNA in the fourth generation would be

- 1) 1 : 1 : 0
- 2) 1 : 4 : 0
- 3) 0 : 1 : 3
- 4) 0 : 1 : 7

172. Third trophic level in an ecosystem are

- 1) Primary producer
- 2) Primary consumer
- 3) Primary carnivore
- 4) Secondary carnivore

173. A semi-dwarf variety of wheat is

- 1) Sonalika
- 2) IR-8
- 3) *Triticum*
- 4) Jaya

174. Which of the following is a set of bacterial disease?

- 1) Cholera, Typhoid and Mumps
- 2) Diphtheria, Leprosy and Plague
- 3) Malaria, Mumps and Poliomyelitis
- 4) Tetanus, Tuberculosis and Measles

175. Phycocolloids are the substances which having capacity to hold water are mainly obtain from:

- 1) Chlorophyceae
- 2) Cyanophyceae
- 3) Rhodophyceae
- 4) All of these

176. Which one is a correct match?

- 1) Bhang – Analgesic
- 2) Cocaine – Opiate narcotics
- 3) Morphine – Hallucinogen
- 4) Barbiturate – Sleeping pill

177. Which of the following palindromic sequence is recognized by *Eco* RI?

- 1) $5' \downarrow \text{GAATTC} 3'$
 $3' \text{CTTAAG} \uparrow 5'$
- 2) $5' \downarrow \text{CCCGGG} 3'$
 $3' \text{GGGCCCC} \uparrow 5'$
- 3) $5' \downarrow \text{AGTACT} 3'$
 $3' \text{TCA TGA} \uparrow 5'$
- 4) $5' \downarrow \text{GGATTC} 3'$
 $3' \text{CCTAGG} \uparrow 5'$

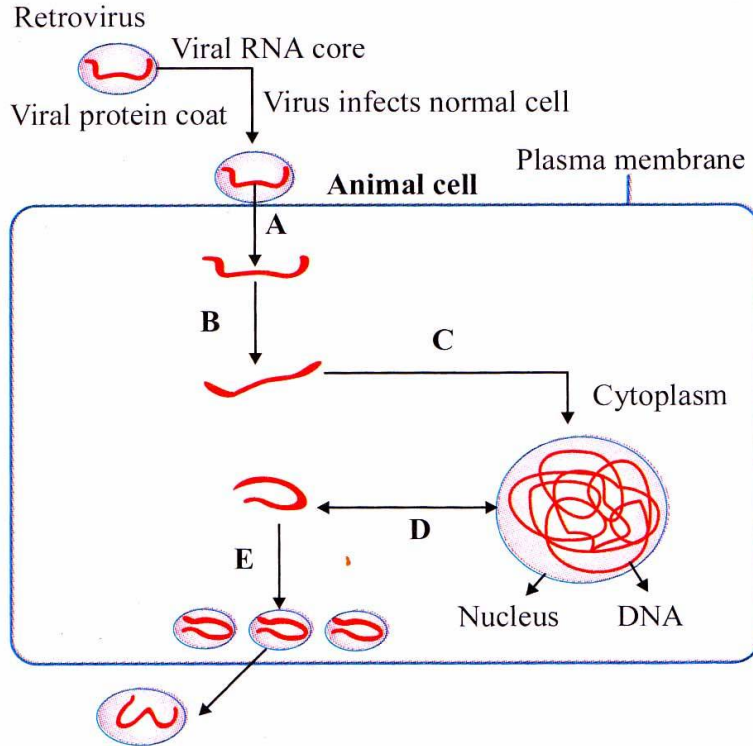
178. Identify the incorrect one

- 1) Physical barrier – mucus membrane, skin
- 2) Physiological barrier- sweat, sebum, tear
- 3) Cytokine barrier – inter, leukins, interferons
- 4) Cellular barriers – T-cells, B-cells, Antibodies

179. Which of the following is correct?

- 1) A nematode *Meloidiogyne incognita* infects the roots of tobacco plants and causes a great reduction in yield
- 2) Nematode infection can be prevented in tobacco plants by RNAi technology
- 3) RNA interference takes place in all eukaryotic organisms as a method of cellular defense
- 4) All of the above

180. The figure given below shown made of action if AIDS virus. Identify steps A, B, C, D and E labelled in it



- 1) A-new viral DNA, B- viral RNA introduced into cell, C-viral DNA incorporated into host genome, D-viral DNA, E-new viruses produced
- 2) A- viral DNA incorporated into host genome, B-viral DNA, C- new viral RNA, D- viral RNA introduced, E-new viruses produced
- 3) A- viral RNA introduced, B-viral DNA, C-viral DNA incorporated into host genome, D-new viral RNA, E-new viruses produced
- 4) A- new DNA introduced, B-viral RNA, C-viral RNA incorporated into host genome, D-new viral DNA, E-new viruses produced