91. Chipko movement was launched for the protection of
(a) grasslands (b) forests
(c) livestock (d) wet lands

92. Elbow joint is an example of
(a) pivot joint (b) hinge joint
(c) gliding joint (d) ball and socket joint

93. Mannitol is the stored food in of
(a) *Chara* (b) *Porphyra*
(c) *Fucus* (d) *Gracillaria*

94. Which one of the following pairs of food components in humans reaches the stomach totally undigested?
(a) Protein and starch
(b) Starch and fat
(c) Fat and cellulose
(d) Starch and cellulose

95. Which one of the following groups of animals is bilaterally symmetrical and triploblastic?
(a) Coelenterates (cnidarians)
(b) Aschelminthes (roundworms)
(c) Ctenophores
(d) Sponges

96. A change in the amount of yolk and its distribution in the egg will affect
(a) formation of zygote
(b) pattern of cleavage
(c) number of blastomeres produced
(d) fertilization

97. Stroma in the chloroplasts of higher plants contains
(a) light-independent reaction enzymes
(b) light-dependent reaction enzymes
(c) ribosomes
(d) chlorophyll

98. Foetal ejection reflex in human female is induced by
(a) pressure exerted by amniotic fluid
(b) release of oxytocin from pituitary
(c) fully developed foetus and placenta
(d) differentiation of mammary glands

99. Which of the following plant species you would select for the production of bioethanol?
(a) *Brassica* (b) *Zea mays*
(c) *Pongamia* (d) *Jatropha*

100. Which one of the following is the correct pairing of a body part and the kind of muscle tissue that moves it?
(a) Heart wall — Involuntary unstriated muscle
(b) Biceps of upper arm — Smooth muscle fibres
(c) Abdominal wall — Smooth muscle
(d) Iris — Involuntary smooth muscle

101 Oxygenic photosynthesis occurs in
(a) *Chromatium* (b) *Oscillatoria*
(c) *Rhodospirillum* (d) *Chlorobium*

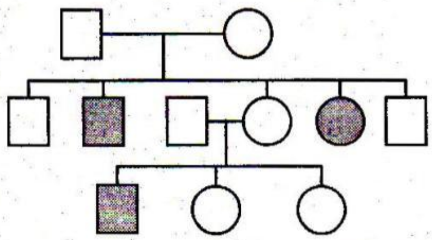
102 The annular and spirally thickened conducting elements generally develop in the protoxylem when the root or stem is
(a) maturing (b) elongating
(c) widening (d) differentiating

103. Sickle cell anaemia is
(a) an autosomal linked dominant trait
(b) caused by substitution of valine by glutamic acid in the β-globin chain of haemoglobin
(c) caused by a change in base pair of DNA
(d) characterized by elongated sickle like RBCs with a nucleus

104. There is no DNA in
(a) an enucleated ovum
(b) mature RBCs
(c) a mature spermatozoan
(d) hair root

105. Which one of the following has maximum genetic diversity in India?
(a) Teak (b) Mango
(c) Wheat (d) Tea

106. Study the pedigree chart given below



What does it show?

(a) Inheritance of a sex-linked inborn error of metabolism like phenylketonuria
(b) Inheritance of a condition like phenylketonuria as an autosomal recessive trait
(c) The pedigree chart is wrong as this is not possible
(d) Inheritance of a recessive sex-linked disease like haemophilia

107. Somaclones are obtained by

(a) tissue culture (b) plant breeding
(c) irradiation (d) genetic engineering

108. Which of the following is a pair of viral diseases?

(a) Ringworm, AIDS
(b) Common cold, AIDS
(c) Dysentery, common cold
(d) Typhoid, tuberculosis

109. Which of the following is not used as a biopesticide?

(a) *Bacillus thuringiensis*
(b) *Trichoderma harzianum*
(c) Nuclear Polyhedrosis Virus (NPV)
(d) *Xanthomonas campestris*

110. Cytoskeleton is made up of

(a) calcium carbonate granules
(b) callose deposits
(c) cellulosic microfibrils
(d) proteinaceous filaments

111. Which one of the following is the most likely reason of not occuring regular menstruation cycle in females ?

(a) Fertilization of the ovum
(b) Maintenance of the hypertrophical endometrial lining
(c) Maintenance of high concentration of sex-hormones in the blood stream
(d) Retention of well-developed corpus luteum

112. The floral formula $\oplus$ ⚥ $K_{(5)}\ \overset{\frown}{C_{(5)}\ A_5}\ \underline{G(2)}$ is that of

(a) tulip
(b) soybean
(c) sunnhemp
(d) tobacco

113. Which one of the following statement is true regarding digestion and absorption of food in humans?

(a) Oxyntic cells in our stomach secrete the proenzyme pepsinogen.
(b) Fructose and amino acids are absorbed through intestinal mucosa with the help of carrier ions like Na^+.
(c) Chylomicrons are small lipoprotein particles that are transported from intestine into blood capillaries.
(d) About 60% of starch is hydrolysed by salivary amylase in our mouth.

114. Manganese is required in

(a) nucleic acid synthesis
(b) plant cell wall formation
(c) photolysis of water during photosynthesis
(d) chlorophyll synthesis

115. Removal of introns and joining the exons in a defined order in a transcription unit is called

(a) splicing
(b) tailing
(c) transformation
(d) capping

116. Seminal plasma in human is rich in
(a) fructose, calcium and certain enzymes
(b) fructose and calcium but has no enzymes
(c) glucose and certain enzymes but has no calcium
(d) fructose and certain enzymes but poor in calcium

117. Synapsis occurs between
(a) a male and a female gamete
(b) *m*RNA and ribosomes
(c) spindle fibres and centromere
(d) two homologous chromosomes

118. Select the incorrect statement from the following
(a) linkage is an exception to the principle of independent assortment in heredity
(b) galactosemia is an inborn error of metabolism
(c) small population size results in random genetic drift in a population
(d) baldness is a sex limited trait

119. Which one of the following types of organisms occupy more than one trophic level in a pond ecosystem ?
(a) Phytoplankton (b) Fish
(c) Zooplankton (d) Frog

120. Which one is the wrong pairing for the disease and its causal organism?
(a) Late blight of potato—*Alternaria solani*
(b) Black rust of wheat—*Puccinia graminis*
(c) Loose smut of wheat—*Ustilago nuda*
(d) Root-knot of vegetables—*Meloidogyne* sp.

121. Vegetative propagation in **mint occurs by**
(a) runner
(b) offset
(c) rhizome
(d) sucker

122. One of the synthetic auxin is
(a) NAA (b) IAA
(c) GA (d) IBA

123. The correct sequence of spermatogenetic stages leading to the formation of sperms in a mature human testis is
(a) spermatocyte–spermatogonia–spermatid – sperms
(b) spermatogonia–spermatocyte–spermatid – sperms
(c) spermatid–spermatocyte–spermatogonia –sperms
(d) spermatogonia–spermatid–spermatocyte –sperms

124. The kind of tissue that forms the supportive structure in our pinna (external ears) is also found in
(a) vertebrae (b) nails
(c) ear ossicles (d) tip of the nose

125. Which one of the following is a vascular cryptogam?
(a) *Equisetum* (b) *Ginkgo*
(c) *Marchantia* (d) *Cedrus*

126. Montreal protocol aims at
(a) reduction of ozone depleting substances
(b) biodiversity conservation
(c) control of water pollution
(d) control of CO_2 emission

127. Guard cells help in
(a) protection against grazing
(b) transpiration
(c) guttation
(d) fighting against infection

128. Cotyledons and testa are edible parts of
(a) groundnut and pomegranate
(b) walnut and tamarind
(c) french bean and coconut
(d) cashew nut and litchi

129. T O Diener discovered a
(a) free infectious RNA
(b) free infectious DNA
(c) infectious protein
(d) bacteriophage

130. Which one of the following pairs is wrongly matched?
(a) Detergents — Lipase
(b) Alcohol — Nitrogenase
(c) Fruit juice — Pectinase
(d) Textile — Amylase

131. Biochemical Oxygen Demand (BOD) in a river water
(a) remains unchanged when algal bloom occurs
(b) has no relationship with concentration of oxygen in the water
(c) gives a measure of *Salmonella* in the water
(d) increases when sewage gets mixed with river water

132. Cyclic-photophosphorylation results in the formation of
(a) NADPH
(b) ATP and NADPH
(c) ATP, NADPH and O_2
(d) ATP

133. Which of the following is a symbiotic nitrogen fixer?
(a) *Glomus* (b) *Azotobacter*
(c) *Frankia* (d) *Azolla*

134. Semiconservative replication of DNA was first demonstrated in
(a) *Drosophila melanogaster*
(b) *Escherichia coli*
(c) *Streptococcus pneumoniae*
(d) *Salmonella typhimurium*

135. A fruit developed from hypanthodium inflorescence is called
(a) hesperidium (b) sorosis
(c) syconus (d) caryopsis

136. Transgenic plants are
(a) produced by a somatic embryo in artificial medium
(b) generated by introducing foreign DNA in to a cell and regenerating a plant from that cell
(c) produced after protoplast fusion in artificial medium
(d) grown in artificial medium after hybridization in the field

137. Global agreement in specific control strategies to reduce the release of ozone depleting substances, was adopted by
(a) Rio de Janeiro Conference
(b) The Montreal Protocol
(c) The Koyoto Protocol
(d) The Vienna Convention

138. An example of a seed with endosperm, perisperm and caruncle is
(a) cotton (b) coffee
(c) lily (d) castor

139. *Peripatus* is a connecting link between
(a) Ctenophora and Platyhelminthes
(b) Mollusca and Echinodermata
(c) Annelida and Arthropoda
(d) Coelenterata and Porifera

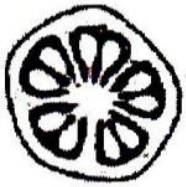
140. The technique called gamete intra fallopian transfer (GIFT) is recommended for those females
(a) who cannot produce an ovum
(b) who cannot retain the foetus inside uterus
(c) who cervical canal is too narrow to allow passage for the sperms
(d) who cannot provide suitable environmental for fertilization

141. Which one of the following is a possibility for most of us in regard to breathing, by making a conscious effort?
(a) One can breathe out air totally without oxygen
(b) One can breathe out air through eustachian tubes by closing both the nose and the mouth
(c) One can consiously breathe in and breathe out by moving the diaphragm alone, without moving the ribs at all
(d) The lungs can be made fully empty by forcefully breathing out all air from them

142. *Bacillus thuringiensis* forms protein crystals, which contain insecticidal protein
(a) binds with epithelial cells of midgut of the insect pest ultimately killing it
(b) is coded by several genes including the gene *cry*
(c) is activated by acid of pH of the foregut of the insect pest
(d) does not kill the carrier bacterium which is itself resistant to this toxin

143. Which one of the following pairs is wrongly matched while the remaining three are correct?
(a) *Penicillium* — Conidia
(b) Water hyacinth — Runner
(c) *Bryophyllum* — Leat buds
(d) *Agave* — Bulbils

144. Which one of the following diagrams represents the placentation in *Dianthus*?

(a) 

(b) 

(c) 

(d) 

145. Which one of the following statements is totally wrong about the occurrence of notochord, while the other three are correct?
(a) It is present only in larval tail in Ascidians
(b) It is replaced by a vertebral column in adult frog
(c) It is absent throughout life in humans from the very beginning
(d) It is present throughout life in *Amphioxus*

146. Which one of the following animals may occupy more than one trophic levels in the same ecosystem at the same time?
(a) Sparrow (b) Lion
(c) Goat (d) Frog

147. Both, hydrarch and xerarch successions lead to
(a) medium water conditions
(b) xeric conditions
(c) highly dry conditions
(d) excessive wet conditions

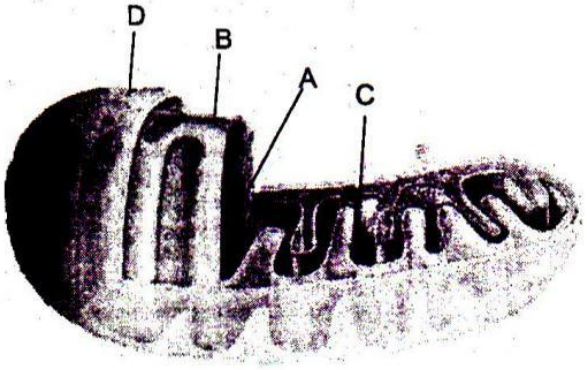
148. What happens during fertilization in humans after many sperms reach close to the ovum?
(a) Secretions of acrosome helps one sperm enter cytoplasm of ovum through zona pellucida
(b) All sperms except the one nearest to the ovum lose their tails
(c) Cells of corona radiata trap all the sperms except one
(d) Only two sperms nearest the ovum penetrate zona pellucida

149. About which day in a normal human menstrual cycle does rapid secretion of LH (popularly called LH surge) normally occurs?
(a) 14^{th} day (b) 20^{th} day
(c) 5^{th} day (d) 11^{th} day

150. The cells lining the blood vessels belong to the category of
(a) smooth muscle tissue
(b) squamous epithelium
(c) columnar epithelium
(d) connective tissue

151. The pathogen *Microsporum* responsible for ringworm disease in humans belongs to the same kingdom of organisms as that of
(a) *Taenia*, a tapeworm
(b) *Wuchereria*, a filarial worm
(c) *Rhizopus*, a mould
(d) *Ascaris*, a round worm

152. The figure below shows the structure of a mitochondrion with its four parts labelled (A), (B), (C) and (D). Select the part correctly matched with its function.



(a) D—Outer membrane-gives—rise to inner membrane by splitting
(b) B—Inner membrane—forms infolding called cristae
(c) C—Cristae—possess single circular DNA molecule and ribosomes
(d) A—Matrix—major site for respiratory chain enzymes

153. Read the following statement having two blanks (1 and 2).

A drug used for ……(1)…… patients is obtained from a species of the organism ……(2)……. The one correct option for the two blanks is.

	Blank-1	Blank-2
(a)	Heart	*Penicillium*
(b)	Organ-transplant	*Trichoderma*
(c)	Swine flu	*Monascus*
(d)	AIDS	*Pseudomonas*

154. Silencing of *m*RNA has been used in producing transgenic plants resistant to
(a) bollworms (b) nematodes
(c) white rusts (d) bacterial blights

155. At metaphase, chromosomes are attached to the spindle fibres by their
(a) satellites
(b) secondary constrictions
(c) kinetochores
(d) centromere

156. Consider the following statements (I-IV) about organic farming.
I. Utilizes genetically modified crops like *Bt* cotton
II. Uses only naturally produced inputs like compost
III. Does not use pesticides and urea
IV. Produces vegetables rich in vitamins and minerals

Which of the above statements are correct?
(a) (II), (III) and (IV)
(b) (III) and (IV) only
(c) (II) and (III) only
(d) (I) and (II) only

157. One of the constituents of the pancreatic juice while poured into the duodenum in humans, is
(a) trypsinogen (b) chymotrypsin
(c) trypsin (d) enterokinase

158. Frogs differ from humans in possessing
(a) paired cerebral hemispheres
(b) hepatic portal system
(c) nucleated red blood cells
(d) thyroid as well as parathyroid

159. Which one of the following option gives the correct matching of a disease with its causative organism and mode of infection?

Disease	Gausative Organisms	Mode of Infection
(a) Typhoid	*Salmonella typhi*	With inspired air
(b) Pneumonia	*Sreptococcus pneumoniae*	Droplet infection
(c) Elephantiasis	*Wuchereria bancrofti*	Infected water and food
(d) Malaria	*Plasmodium vivax*	Bite of male *Anopheles* mos-qūito

160. Function of companion cells is
(a) providing energy to sieve elements for active transport
(b) providing water to phloem
(c) loading of sucrose in to sieve elements by passive transport
(d) loading of sucrose into sieve elements

161. Test cross in plants of in *Drosophila* involves crossing
(a) between two genotypes with recessive trait
(b) between two F_1 hybrids
(c) the F_1 hybrid with a double recessive genotype
(d) between two genotypes with dominant trait

162. Some vascular bundles are described as open because these
(a) are surrounded by pericycle but to endodermis
(b) are capable of producing secondary xylem and phloem
(c) possess conjunctive tissue between xylem and phloem
(d) are not surrounded by pericycle

163. In mitochondria, protons accumulate in the
(a) outer membrane
(b) inner membrane
(c) intermembrane space
(d) matrix

164. The breakdown of detritus into smaller particles by earthworm is a process called
(a) humification (b) fragmentation
(c) mineralisation (d) catabolism

165. Whc rled, simple leaves with reticulate venation are present in
(a) *Calotropis* (b) Neem
(c) China rose (d) *Alstonia*

166. Sweet potato is homolgous to
(a) potato (b) colocasia
(c) ginger (d) turnip

167. The unequivocal proof of DNA as the genetic material came from the studies on a
(a) bacterium (b) fungus
(c) viroid (d) bacterial virus

168. Consider the following four statements whether they are correct of wrong,
I. The sporophyte in liverworts is more elaborate than that in mosses
II. *Salvinia* is heterosporous
III. The life-cycle in all seed-bearing plants is diplontic
IV. In *Pinus* male and female cones are borne on different tress
(a) Statements (I) and (III)
(b) Statements (I) and (IV)
(c) Statements (II) and (III)
(d) Statements (I) and (II)

169. Consider the following four statements (I-IV) related to the common frog *Rana tigrina*, and select the correct option stating which ones are true (T) and which ones are false (F).
I. On dry land it would die due to lack of O_2 its mouth is forcibly kept closed for a few days.
II. It has four-chambered heart.
III. On day land it turns uricotelic from ureotelic.
IV. Its life-history is carried out in pond water.

	I	II	III	IV
(a)	T	F	F	T
(b)	T	T	F	F
(c)	F	F	T	T
(d)	F	T	T	F

170. In Kranz anatomy, the bundle sheath cells have
(a) thin walls, many intercellular spaces and no chloroplasts
(b) thick walls, no intercellular spaces and large number of chloroplasts
(c) thin walls, no intercellular spaces and several chloroplasts
(d) thick walls, many intercellular space and few chloroplasts