SET A

Solved Paper

SSC FCI ASSISTANT GRADE-III EXAM

HELD ON : 15.04.2012

(BIOLOGICAL SCIENCE)

1. Changes in gene frequencies due to sampling errors in very small populations is termed as
(1) Equilibrium
(2) Disequilibrium
(3) Panmixis
(4) Genetic drift

2. A genetic locus that serves as a recognition site for UNA polymerase attachment is
(1) Primer (2) Promoter
(3) Inhibitor (4) Codon

3. A phenomenon wherein a single gene has more than one phenotypic effect is known as
(1) Pleiotropism
(2) Epistasis
(3) Hypostasis
(4) Duplicate genes

4. Which one of the following is a rich source of protein ?
(1) Scytonema
(2) Spirulina
(3) Spirogyra
(4) Stigonema

5. Oblique ovary is seen in
(1) Rutaceae
(2) Solanaceae
(3) Capparidaceae
(4) Asclepiadaceae

6. Numerous vascular bundles are arranged in a scattered manner in
(1) Dicot stem (2) Dicot root
(3) Monocot root
(4) Monocot stem

7. Glycolysis is also known as
(1) Gluconeogenesis
(2) EMP Pathway
(3) Hexose monophosphate shunt
(4) Photorespiration

8. An amino acid that cannot participate in alpha-helical formation is
(1) Histidine
(2) Threonine (3) Proline
(4) Phenylalanine

9. Rate of photosynthesis is higher in _____ light.
(1) White (2) Red
(3) Green (4) Blue

10. The key enzyme in C_4 photosynthesis is
(1) Pyruvic decarboxylase
(2) RUBP oxygenase
(3) PEP carboxylase
(4) PEP decarboxylase

11. The stomata will open, when
(1) K^+ ions move into the guard cells
(2) K^+ ions move into the subsidiary cells
(3) Guard cells are flaccid
(4) Acidity increases in guard cells

12. The plant hormone that regulates stomatal opening is
(1) Cytokinin (2) Auxin
(3) Abscisic acid
(4) Ethylene

13. The fruit ripening hormone is
(1) Abscisic acid
(2) Cytokinin
(3) Ethylene (4) Gibberellin

14. A short day plant has a critical period of 11 h. Under which condition will it produce flowers?
(1) 12 h of light and 12 h of darkness
(2) 10 h of light and 14 h of darkness
(3) 14 h of light and 10 h of darkness
(4) 13 h of light and 11 h of darkness

15. The key enzyme in nitrogen fixation is
(1) Nitrogenase
(2) Nitrogen reductase
(3) Nitrate reductase
(4) Nitrite reductase

16. The largest herbarium in India is located at
(1) New Delhi (2) Dehradun
(3) Kolkata (4) Pune

17. The edible part in Pomegranate is
(1) Epicarp (2) Endocarp
(3) Mesocarp (4) Testa

18. Which one of the following is an example for aggregate fruit?
(1) Strawberry (2) Pineapple
(3) Sapota (4) Bread fruit

19. An alkaloid used to induce polyploidy is
(1) Azadirachtin
(2) Strychnine
(3) Vincristin (4) Colchicine

20. International Rice Research Institute is in
(1) Hyderabad (2) Cuttack
(3) Kenya (4) Manila

21. Lysozyme is an enzyme which acts against
(1) Gram negative bacteria
(2) Gram positive bacteria
(3) Fungi (4) Yeast

22. In which of the following food and beverage production do we use bacteria ?
(1) Yoghurt (2) Beer
(3) Wine (4) Bread

23. Obligate anaerobic bacteria can
(1) grow without oxygen and produce high energy
(2) grow without oxygen and produce low energy
(3) have a fermentative metabolism and a respiratory chain
(4) grow with or without oxygen and produce medium energy

24. Which of the following are present in monocots but absent in dicots ?
a. Endodermis
b. Bundle sheath
c. Pericycle

(1) a only (2) b only
(3) a and b (4) b and c

25. Which of the following elements are required for the synthesis of chlorophyll ?
a. Fe b. Ca
c. Mg d. K
(1) a and d (2) b and c
(3) a and c (4) b and d

26. If radioactive CO_2 is administered to a C_3 plant, the radioactivity first appears in
(1) Glucose
(2) Pyruvic acid
(3) Oxaloacetic acid
(4) 3-phosphoglyceric acid

27. **Statement A :**
Uppermost layer of soil is known as O-Horizon.
Statement B :
It has decomposed organic matter.
(1) Statement A is correct, but statement B is incorrect
(2) Statement A is incorrect, but statement B is correct
(3) Both A and B are correct
(4) Both A and B are incorrect

28. Which of the following is **not** a character of hydrophytes ?
(1) Well developed vascular system
(2) Poor root development
(3) Abundant air spaces
(4) Stomata on upper surface

29. Which one of the following is the correct food chain ?
(1) Algae - insects - frog- peacock - snake
(2) Algae - frog - insects - snake - peacock
(3) Algae - frog - insects - peacock - snake
(4) Algae - insects - frog - snake - peacock

30. Number of linkage groups corresponds to ____ condition.
(1) tetraploid (2) triploid
(3) diploid (4) haploid

31. The process by which Mendelian factors segregate is _____ and _____ means a pair of contrasting characters.
(1) hybridization, allele
(2) heterozygote, meiosis
(3) meiosis, allele
(4) meiosis, heterozygote

32. DNA and RNA are similar to each other because both
(1) have similar sugars
(2) are nucleotide polymers
(3) have similar pyrimidines
(4) are double stranded

33. If the undifferentiated mass of cells is _____, the part taken from the plant for tissue culture is_____.
(1) parenchyma, explant
(2) explant, callus
(3) callus, explant
(4) explant, parenchyma

34. A simple technique has been developed in India by using the following organisms as biofertilizers:
(1) Azotobacter and Rhizobium
(2) Azolla and Azotobacter
(3) Azolla and Rhizobium
(4) Azotobacter and Nostoc

35. Planktons floating in open water are called
(1) Potamoplanktons
(2) Heleoplanktons
(3) Euplanktons
(4) Mesoplanktons

36. Algae found in mud are called
(1) Endedaphic algae
(2) Epidaphic algae
(3) Episammic algae
(4) Epipelic algae

37. Trace element essential for algal growth is
(1) Nitrogen
(2) Phosphorus
(3) Sulphur (4) Copper

38. LPP-1 is a
(1) Mycophage
(2) Bacteriophage
(3) Cyanophage
(4) Lambda phage

39. A sclerotium refers to a modified mycelium which is
(1) an underground structure
(2) a food storing organ
(3) a conidial type
(4) a hard resting body

40. Algal fungi are placed in
(1) Ascomycetes
(2) Phycomycetes
(3) Deuteromycetes
(4) Basidiomycetes

41. Late blight of potato is caused by
(1) Synchytrium endobioticum
(2) Alternaria solani
(3) Puccinia graminis
(4) Phytophthora infestans

42. Albugo Candida is an example of
(1) Obligate saprophyte
(2) Facultative saprophyte
(3) Facultative parasite
(4) Obligate parasite

43. The somatic phase in a myxomycetous fungus is called
(1) Plasmodium
(2) Hypha
(3) Mycelium
(4) Rhizomorph

44. A fungus producing 8 spores in a sac is a distinct feature of
(1) Deuteromycetes
(2) Basidiomycetes
(3) Ascomycetes
(4) Phycornycetes

45. Cambium is absent in
(1) Dicot root
(2) Monocot root
(3) Dicot stem
(4) Ficus root

46. In paddy, the type of inflorescence is said to be
(1) Raceme (2) Panicle
(3) Thyrsus (4) Cyathium

47. Which one of the following is an endangered plant ?
(1) Delphinium ajacis
(2) Canna edulis
(3) Rauwolfia serpentina
(4) Coleus aromaticus

48. Botanical name of Pearl millet (Bajra) is
(1) Avena sativa
(2) Zea mays
(3) Eleusine coracana
(4) Pennisetum typhoides

49. Chromosome with arms of equal length is called

(1) Acrocentric
(2) Metacentric
(3) Telocentric
(4) Submetacentric

50. The genetic event that recombines linked genes is known as
(1) Linkage
(2) Coupling
(3) Repulsion
(4) Crossing over

51. Hardy-Weinberg law is applicable for
(1) Mutant population
(2) Population under natural selection
(3) Migrating population
(4) Population with no evolutionary change

52. A diagram that represents the karyotype of a species is
(1) Histogram
(2) Dendrogram
(3) Idiogram
(4) Punnett square

53. Which is the matching set in classification ?
(1) Neries, planaria, roundworm, earthworm
(2) Millipede, crab, centipede, cockroach
(3) Starfish, jellyfish, cuttlefish, octopus
(4) Sea-urchin, lobster, leech, locust

54. The blood in the body of insects
(1) flows in arteries and veins
(2) flows in open circulation
(3) resembles human beings in colour
(4) contains haemoglobin in erythrocytes

55. In starfish, which has dual function of locomotion and respiration ?
(1) Tiedemann's body
(2) Ampulla
(3) Tube feet
(4) Axial sinus

56. What is common between the septal nephridia of earthworm and malpighian tubule of cockroach ?
(1) Both are segmentally arranged in the body
(2) Both discharge their contents to the outside of the body through the alimentary canal
(3) Both excrete the nitrogenous wastes in the form of urea
(4) Both have their free ends opening into the body cavity

57. The insects excrete in the form of uric acid because
(1) most of them are terrestrial
(2) the circulatory system is open
(3) the blood is colourless
(4) most of them are aquatic

58. The earliest known vertebrates to appear in fossil records are
(1) Ostracoderms
(2) Placoderms
(3) Tetrapods
(4) Mammals

59. Lung fishes are included in the order
(1) Dipnoi
(2) Crossopterygii
(3) Acipenseriformes
(4) Polypteriformes

60. Down feathers are present in
(1) Male pigeon
(2) Female pigeon
(3) Adult pigeon
(4) Newly hatched pigeon

61. Measurement of the rate of oxygen consumption in unit volume of water over a period of time is carried out to determine
(1) Fermentation
(2) Biogas generation
(3) Biosynthetic pathway
(4) Biological oxygen demand

62. Biosphere is made up of
(1) organism
(2) organism and lithosphere
(3) organism, lithosphere and atmosphere
(4) organism, lithosphere, atmosphere and hydrosphere

63. Biotic factors include
(1) Physical factors of soil which affect life
(2) Chemical factors of soil which affect life
(3) All living organisms which influence other organisms
(4) Factors of atmosphere which affect life

64. Competition for food, light and space is most severe in
(1) closely related species growing in different habitats
(2) closely related species growing in the same area
(3) distantly related species growing in the same habitat
(4) distantly related species growing in different habitats

65. Population density is the
(1) number of species per community
(2) number of communities per ecosystem
(3) number of individuals per species
(4) number of individuals per unit area

66. Energy and nutrients enter a community by way of the
(1) Producer (2) Consumer
(3) Scavenger (4) Detrivores

67. A sequence of species through which the organic molecules in a community pass is called
(1) Pyramid of energy
(2) Nutrient cycle
(3) Nitrogen cycle
(4) Food chain

68. Sudden mass death of fishes from oxygen depletion is more likely in the
(1) Eutrophic lakes
(2) Oxalotrophic lakes
(3) Oligotrophic lakes
(4) Mesotrophic lakes

69. Nights are cool in desert, because
(1) the elevation is always high
(2) the dry air does not radiate much heat back to the Earth's surface

(3) the air pressure is low
(4) so much heat is absorbed by the Earth's surface during the day

70. The sanctuary having maximum number of rare animals is
(1) Kaziranga National Park
(2) Corbett National Park
(3) Manas National Park
(4) Dudhwa National Park

71. In which state has the project started to protect the endangered species of Crocodile?
(1) Maharashtra
(2) Uttar Pradesh
(3) Karnataka
(4) Kerala

72. The famous 'Chipko Movement' is associated with
(1) S.L. Bahuguna
(2) Indira Gandhi
(3) Jawaharlal Nehru
(4) H.N. Bahuguna

73. Red data book is famous for
(1) Extinct animals
(2) Endangered animals and plants
(3) Endangered animals
(4) Important wildlife

74. The most harmful types of environmental pollutants are
(1) Natural nutrients present in excess
(2) Wastes from feed-lots
(3) Human organic wastes
(4) Non-biodegradable chemicals

75. The brain of chick develops from
(1) Ectoderm
(2) Ecto-mesoderm
(3) Endoderm
(4) Mesoderm

76. The type of parthenogenesis in which male develops from unfertilized egg and the female develops from fertilized egg is known
(1) Apospory
(2) Arrhenotoky
(3) Gynogenesis
(4) Thelytoky

77. Solid tumours in nerve tissue, cervical, breast, skin, and brain are examples of
(1) Sarcomas
(2) Lymphomas
(3) Leukemias
(4) Carcinomas

78. Lamarck believed certain parts of the body get larger and more complex through the generations because they
(1) are most similar to God's perfection
(2) are predetermined to do so
(3) contribute to greater reproductive success
(4) are used more extensively than other parts

79. The change in colour and odour of fats on exposure to light, moisture and air is known as
(1) Saponification
(2) Acidity
(3) Rancidity
(4) Alkalinity

80. Carrier organism is an individual which carries a
(1) dominant gene that is not expressed
(2) recessive gene that is not expressed
(3) recessive gene that is expre-ssed
(4) dominant gene that is expre-ssed

81. Bottom layer of deep fresh water habitat is
(1) Hypolimnion
(2) Epilimnion
(3) Thermocline
(4) Metalimnion

82. Largest wind power producer in India is
(1) Kerala
(2) Karnataka
(3) Andhra Pradesh
(4) Tamil Nadu

83. International Convention on Biological Diversity was ratified in the year
(1) 1971 (2) 1994
(3) 1973 (4) 1990

84. Who proposed Germ plasm theory ?
(1) August Weismann
(2) Hugo de Vries
(3) Sewall Wright
(4) Mayr and Wagner

85. Which of the following was explained by Darwin ?
(1) Origin of new character
(2) Process of inheritance
(3) Existence of useful variation
(4) Existence of useless variation

86. India is included in _____ Zoogeographical realm.
(1) Palaearctic
(2) Neotropical
(3) Nearctic (4) Oriental

87. Human DNA is more similar to the DNA of
(1) Rhesus monkey
(2) Chimpanzee
(3) Gibbon
(4) Capuchin monkey

88. Which of these is **not** a water borne disease ?
(1) Hepatitis A (2) Hepatitis B
(3) Polio (4) Typhoid

89. Which is considered as biological paradise in India ?
(1) Gulf of Mannar
(2) Nilgiri Bioreserve
(3) Sundarbans
(4) Nanda Devi

90. Minamata disease is due to the pollutant
(1) Mercury (2) Cadmium
(3) Lead (4) Arsenic

91. National Bureau of Fish Genetic Resources (NBFGR) is located in
(1) Chennai (2) New Delhi
(3) Lucknow (4) Bangalore

92. Which one of the following is the brackish water fish ?
(1) Mackerel (2) Seerfish
(3) Pomfret (4) Mullet

93. Which of these is denitrifying bacteria ?
(1) Rhizobium
(2) Pseudomonas
(3) Azotobacter
(4) Clostridium

94. Which of these nitrogen base returns to normal state during photoreactivation ?
(1) Adenine (2) Guanine
(3) Cytosine (4) Thymine

95. Match the following layers of soil with materials present in them :

Layer of soil	Material
1. O Horizon	a. Alluvial
2. B Horizon	b. Humus
3. C Horizon	c. Consolidated rock
4. R Horizon	d. Weathered rock

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

96. Synaptonemal complexes appear during which phase of meiosis ?
(1) Leptotene (2) Diplotene
(3) Zygotene (4) Pachytene

97. Which of these is often called as 'cell organiser' ?
(1) Nucleus (2) Centriole
(3) Nucleolus (4) Ribosome

98. Zymogen granules consist of
(1) Protein (2) Glycogen
(3) Fatty acid
(4) Cholesterol

99. The power house of the cell is
(1) Nucleus (2) Ribosome
(3) Mitochondria
(4) Lysosome

100. _____compound is present in RNA but not in DNA.
(1) Cytosine (2) Guanine
(3) Uracil (4) Thymine

101. Maximum energy is obtained from
(1) Carbohydrates
(2) Fat
(3) Proteins
(4) Vitamins

102. A true nucleus is absent in
(1) Bacteria (2) Algae
(3) Lichens (4) Fungi

103. Hardness of woody tissue is due to
(1) Silica (2) Lignin
(3) Cellulose (4) Suberin

104. Animal cells do **not** have
(1) Chloroplasts
(2) Ribosomes
(3) Lysosomes (4) Vacuoles

105. Cholesterol content is highest in
(1) Egg yolk (2) Milk
(3) Coffee (4) Tea

106. The sweetest chemical is
(1) Fructose (2) Saccharin
(3) Monellin (4) Sorbitol

107. Pea seeds will germinate best if soaked in a jar containing
(1) H_2 (2) O_2
(3) N_2 (4) CO_2

108. Which vitamin prevents rancidity in oils ?
(1) Vitamin E (2) Vitamin C
(3) Vitamin D (4) Vitamin K

109. Which lipoprotein contains maximum cholesterol ?
(1) HDL (2) LDL
(3) VLDL
(4) Chylomicrons

110. The shape of the growth curve is usually
(1) Inverted bell
(2) Linear
(3) Sigmoid
(4) Zig-Zag

111. Tag enzyme used in PCR is
(1) RNA polymerase
(2) Reverse transcriptase
(3) DNA polymerase
(4) Ligase

112. Polygenic traits can be identified by
(1) QTL mapping
(2) Cluster analysis
(3) Tandem array analysis
(4) Gene mapping

113. Sexual phenotypes of the following genotypes in Drosophila : XXY, XO
(1) male, female
(2) male, male
(3) intersex, female
(4) female, male

114. The forces that can change the frequency of an allele in a population are
(1) forward mutation, gene conversion, neutral evolution and recombination
(2) selection, mutagenesis, migration, inbreeding and random genetic drift
(3) dominance, family selection, fitness and diversification
(4) gene interaction, gene transfer, gene mutation and outbreeding

115. Ribozymes
(1) are ribonucleoprotein particles
(2) are enzymes whose catalytic function resides in RNA subunits
(3) carry out self processing reactions but cannot be considered as true catalysis
(4) require a protein cofactor to form a peptide bond

116. Genetic exchange is prevented by the enzyme DNAase in culture media in case of
(1) Generalised transduction
(2) Conjugation
(3) Specialised transduction
(4) Transformation

117. Antibiotic inhibiting interaction between tRNA and mRNA during protein synthesis in prokaryotes
(1) Tetracyclin
(2) Erythromycin
(3) Neomycin
(4) Streptomycin

118. A pseudogene is
(1) a gene that is expressed at certain developmental stages only
(2) a non-functional gene
(3) a gene that contains a mutation but is functional
(4) a gene that is evolving to become an active gene

119. Arabidopsis thaliana is used as a model system for plant genetics because it is
(1) an aquatic plant
(2) a terrestrial plant
(3) easy to grow and maintain in the lab
(4) a synthetic plant

120. Why are gene libraries constructed ?
(1) To find new genes
(2) To find lipids
(3) To find carbohydrates
(4) To find amino acids

121. Keratin is a
(1) simple protein
(2) conjugated protein
(3) primary derived protein
(4) secondary derived protein

122. The anticodon region is present in
(1) r-RNA (2) hn-RNA
(3) m-RNA (4) t-RNA

123. The phenomenon of osmosis is opposite to
(1) diffusion
(2) adsorption
(3) sedimentation
(4) dialysis

124. DNA replication occurs in
(1) G_1 phase (2) G_2 phase
(3) S phase (4) M phase

125. The precursor for indole acetic acid is
(1) tyrosine
(2) tryptophan
(3) phenylalanine
(4) glycine

126. The cell-organelles are isolated by
(1) differential centrifugation
(2) autoradiography
(3) HPLC
(4) X-ray diffraction

127. Menarche means
(1) menopause
(2) first menstruation cycle
(3) infertility in females
(4) reproduction

128. Largest lymphoid organ is
(1) Spleen
(2) Liver
(3) Peyer's patches
(4) Tonsils

129. In reptiles and birds, nitrogen is excreted in the form of
(1) Urea (2) Uric acid
(3) Ammonia (4) Lipids

130. The essential trace element which catalyzes the formation of Hb in the body is
(1) Mn (2) Mg
(3) Se (4) Cu

131. In ecosystem, micro consumers are called as
(1) Primary consumers
(2) Secondary consumers
(3) Tertiary consumers
(4) Decomposers

132. Which of the following techniques are used in assaying monoclonal antibodies ?
(1) Flow cytometry
(2) PAGE
(3) HPLC
(4) Scintillation counter

133. The deficiency of vitamin B_2 leads to
(1) Pellagra (2) Beri-beri
(3) Scurvy (4) Rickets

134. The following hormones are secreted by the ovary except
(1) Relaxin
(2) Oestrogen
(3) Chorionic gonadotropin
(4) Glucagon

135. If a person's urine shows positivity for Rothera's test, he is excreting
(1) Glucose
(2) Ketone bodies
(3) Phenylalanine
(4) Arginine

136. Pick the odd one out :
(1) Lysine (2) Ornithine
(3) Arginine (4) Leucine

137. N_1 of purine ring is derived from
(1) Glycine (2) Glutamate
(3) Aspartate
(4) Glutamine

138. Which of the following synthetic polypeptides will form a triple helix ?
(1) (Pro-Gly)n
(2) (Phe-Gly-Gly)n
(3) (Pro-Gly-Gly)n
(4) (Gly-Pro-Pro-Gly)n

139. The basis behind lung compliance is
(1) osmosis
(2) viscosity
(3) surface tension
(4) muscle contraction

140. DNA-RNA hybrids are seen in
(1) Replisome
(2) Transcriptome
(3) si-RNA
(4) hn-RNA

141. Dengue fever causing virus is transmitted by
(1) Culex (2) Anopheles
(3) Mansoni (4) Aedes

142. 'Sushi' is the fermented food of
(1) Indonesia (2) Japan
(3) Hungary (4) Mexico

143. "Cheddar" is an example for
(1) hard cheese
(2) soft cheese
(3) semi-soft cheese
(4) milk-coagulating enzyme

144. The Co_2 content of finished beer product is
(1) 60 to 68%
(2) 65 to 70%
(3) 70 to 82%
(4) 45 to 52%

145. Cells that often change their shapes are referred as
(1) palisade (2) trichone
(3) pleomorphic
(4) vibriod

146. World Health Organisation (WHO) announced the eradication of small pox as a disease in the year
(1) 1988 (2) 1986
(3) 1977 (4) 1979

147. When a disease occurs occasionally at irregular intervals in a human population, then it is known as
(1) epidemic (2) pandemic
(3) endemic (4) sporadic

148. The antibody that can cross the placenta and provide passive immunity to the foetus is
(1) IgM (2) IgG
(3) IgA (4) IgE

149. Carcinogens can be identified by
(1) replica plating technique
(2) resistance selection method
(3) Ames test
(4) substrate utilisation test

150. The form of DNA which has left handed helix is
(1) B-DNA (2) Z-DNA
(2) C-DNA (4) A-DNA

151. A disease that attacks many in a community simultaneously is
(1) an epidemic
(2) a noscomial infection
(3) a secondary infection
(4) a bacteremia

152. By the first birthday, a child is immunised against all the following vaccines except
(1) Tuberculosis
(2) Polio
(3) Measles
(4) Yellow fever

153. Transduction is
(1) transfer of a portion of DNA
(2) inhibition of protein synthesis
(3) division of cell mass
(4) nuclear inhibition

154. All of the following are free living nitrogen-fixing bacteria except
(1) Azotobacter
(2) Rhizobium
(3) Klebsiella
(4) Clostridium

155. Which of the following group of the bacteria grows best at temperature 25 to 40 degree C?
(1) Thermophilic
(2) Psychrophilic
(3) Mesophilic
(4) Acidophilic

156. The general unit measurement of bacteria is
(1) n m (2) μ m
(3) m m (4) Å

157. The term "Microbiology" was coined by
(1) Antonie van Leeuwenhoek.
(2) Robert Koch
(3) Louis Pasteur
(4) Julius Richard Petri

158. PCR was discovered by
(1) Craig Venter
(2) Kary Mullis
(3) George Kohler
(4) Herbert Boyer

159. Measles vaccine should be given at the age of
(1) 9 months (2) 9 days
(3) 12 months (4) 12 days

160. Tumour causing viruses are known as
(1) Oncogenic viruses
(2) Para viruses
(3) Tungro viruses
(4) Variola viruses

161. Glazing is done on rice for
(1) Polishing
(2) Whitening
(3) Transparent look
(4) Pearling

162. Drumstick leaves are rich in
(1) Calcium (2) Potassium
(3) Magnesium (4) Manganese

163. Protein isolates are produced by
(1) Electrophoresis
(2) Ultrafiltration
(3) Chromatography
(4) Ultracentrifugation

164. Plunging food into boiling liquid and then immersing in cold water is
(1) Marinating
(2) Sprouting
(3) Blanching
(4) Fermentation

165. A squash should contain
(1) 15% fruit juice
(2) 25% fruit juice
(3) 35% fruit juice
(4) 45% fruit juice

166. Undesirable crystal formation of sugar in confectionery products is called
(1) Winnowing (2) Panning
(3) Engrossing (4) Fudging

167. Red orange colour in saffron is due to
(1) Xanthophyll
(2) Chlorophyll
(3) Crocetin
(4) Polyphenols

168. Acidity of tomato ketchup should be
(1) 0.5% (2) 1.0%
(3) 1.5% (4) 2.0%

169. Conversion of unsaturated oil to saturated fat is known as
(1) Caramelisation
(2) Hydrogenation
(3) Gelatinization
(4) Dextrination

170. Hydrogen peroxide is used as a preservative in
(1) Meat (2) Bread
(3) Confectionery
(4) Milk

171. Hurdle technology consists of
(1) mixture of different ingredients to form a uniform quality product
(2) mixture of different preservation techniques
(3) using irradiation for increasing the shelf life of meat
(4) mixture of freezing and dehydration

172. Choose the correct answer. Beaten rice is also known as
(1) Flaked rice
(2) Polished rice
(3) Puffed rice
(4) Popped rice

173. Choose the correct answer. Candling is a method to assess the
(1) quality of fish
(2) quality of meat
(3) quality of egg
(4) quality of prawns

174. Spice bag is usually used in the processing of
(1) Sauce (2) Jam
(3) Pickle (4) Nectar

175. Consider the following statements :
A. Triple point of water is water exists in three forms.
B. Triple point of water is the principle behind vacuum drying.
(1) Statement A is correct and B is wrong
(2) Statement B is correct and A is wrong
(3) Statements A and B are wrong
(4) Statements A and B are correct

176. Vinegar is used in the preservation of pickle and synthetic vinegar is one of the following :
(1) pure glacial acetic acid
(2) two times dilution of glacial acetic acid
(3) six times dilution of glacial acetic acid
(4) four times dilution of glacial acetic acid

177. Cereals are
(1) deficient in lysine and rich in methionine
(2) rich in lysine and deficient in methionine
(3) rich in lysine and methionine
(4) deficient in lysine and methionine

178. Meal from nuts and oil-seeds are rich in
(1) Vitamins
(2) Minerals
(3) Proteins
(4) Carbohydrates

179. The energy value (kilocalories) of 1 g of fat is
(1) 4 (2) 5
(3) 2 (4) 9

180. Roasting coffee beans improves the content of
(1) Pantothenic acid
(2) Niacin
(3) Riboflavin
(4) Thiamine

181. A large number of fungicides are formulated in the form of
(1) Emulsifiable concentrate
(2) Wettable powder
(3) Dust
(4) Granules

182. Reddening of internal stem tissues with cross-wise white patches is a characteristic symptom of_____of sugarcane.
(1) Wilt
(2) Sett rot
(3) Red rot
(4) Grassy shoot disease

183. An example for reniform nematode
(1) Meloidogyne
(2) Globodera
(3) Rotylenchus
(4) Pratylenchus

184. The common name of Radopholus similis is
(1) Root knot nematode
(2) Lesion nematode
(3) Ring nematode
(4) Burrowing nematode

185. Pathogen responsible for Bengal famine
(1) Helminthosporium oryzae
(2) Pyricularia oryzae
(3) Phytophthora infestans
(4) Colletotrichum falcatum

186. Chemical substance used for delinting of cotton seeds
(1) Nitric acid s
(2) Sulphuric acid
(3) Hydrochloric acid
(4) Citric acid

187. Annual loss of agricultural produce in India is more due to different factors. Find out the factors in correct sequence based on the higher degree of loss to lower degree.
(1) Weeds followed by insects followed by diseases
(2) Insects followed by diseases followed by weeds
(3) Diseases followed by weeds followed by insects
(4) Weeds followed by diseases followed by insects

188. Flooding method of irrigation is suitable for
(1) Rice (2) Red gram
(3) Sunflower (4) Maize

189. Fungal antagonist used for the management of damping off disease of vegetables
(1) Trichoderma
(2) Fusarium
(3) Gliocladium
(4) Geotrichum

190. In hydraulic sprayer, the degree of atomisation is primarily a function of
(1) size of nozzle
(2) air velocity
(3) liquid pressure and the nozzle characteristics
(4) size and shape of the atomizer

191. The crop grown for grain, green manure and fodder
(1) Lentil
(2) Chick pea
(3) Red gram
(4) Cow pea

192. The botanical name of foxtail millet is
(1) Paspalum scrobiculatum
(2) Setaria italica
(3) Eleusine coracana
(4) Panicum milliare

193. Orobanche is
(1) total stem parasite
(2) total root parasite
(3) partial stem parasite
(4) partial root parasite

194. Seed of rice is called
(1) Drupe (2) Berry
(3) Caryopsis (4) Pod

195. An individual with identical alleles in one or more loci is called as
(1) Homozyote
(2) Heterozygote
(3) Prototype
(4) Karyotype

196. A cross between parents differing in single trait is termed as
(1) Back cross
(2) Reciprocal cross
(3) Monohybrid cross
(4) Dihybrid cross

197. Machine used for dehusking of pulses is
(1) energy roll dehusker
(2) rubber roll dehusker
(3) centrifugal dehusker
(4) under-runner disc sheller

198. The breakage of rice may be reduced by
(i) Uniform drying at optimum temperature
(ii) Gelatinizing the starch
(1) both (i) and (ii) are true
(2) (i) true and (ii) false
(3) (i) false and (ii) true
(4) both (i) and (ii) are false

199. The size of a tractor tyre may be represented as

(1) section height × rin. width
(2) section height × rim diameter
(3) section thickness × rim diameter
(4) section radius × rim width

200. The furrow opener used for planting cotton seeds in areas where there is uncertainty of weather is
(1) variable depth furrow openers
(2) disc type furrow openers
(3) constant depth furrow openers
(4) stub runner type furrow openers

ANSWERS

1. (4)	2. (2)	3. (1)	4. (2)
5. (2)	6. (4)	7. (2)	8. (3)
9. (1)	10. (3)	11. (1)	12. (1)
13. (3)	14. (2)	15. (1)	16. (3)
17. (4)	18. (1)	19. (4)	20. (4)
21. (2)	22. (1)	23. (2)	24. (2)
25. (3)	26. (4)	27. (3)	28. (1)
29. (4)	30. (4)	31. (3)	32. (2)
33. (3)	34. (1)	35. (3)	36. (4)
37. (4)	38. (3)	39. (4)	40. (2)
41. (4)	42. (4)	43. (1)	44. (3)
45. (2)	46. (2)	47. (3)	48. (4)
49. (2)	50. (4)	51. (4)	52. (3)
53. (2)	54. (2)	55. (3)	56. (2)
57. (1)	58. (1)	59. (1)	60. (4)
61. (4)	62. (4)	63. (3)	64. (2)
65. (4)	66. (1)	67. (4)	68. (1)
69. (2)	70. (3)	71. (4)	72. (1)
73. (2)	74. (4)	75. (1)	76. (2)
77. (4)	78. (4)	79. (3)	80. (2)
81. (1)	82. (4)	83. (2)	84. (1)
85. (3)	86. (4)	87. (2)	88. (2)
89. (1)	90. (1)	91. (3)	92. (4)
93. (2)	94. (4)	95. (3)	96. (3)
97. (3)	98. (1)	99. (3)	100. (3)
101. (2)	102. (1)	103. (2)	104. (1)
105. (1)	106. (4)	107. (2)	108. (1)
109. (2)	110. (3)	111. (3)	112. (1)
113. (4)	114. (2)	115. (2)	116. (4)
117. (3)	118. (2)	119. (3)	120. (1)
121. (1)	122. (4)	123. (1)	124. (3)
125. (2)	126. (1)	127. (2)	128. (1)
129. (2)	130. (4)	131. (4)	132. (1)
133. (*)	134. (4)	135. (2)	136. (2)
137. (3)	138. (3)	139. (3)	140. (1)
141. (4)	142. (2)	143. (1)	144. (4)
145. (3)	146. (3)	147. (4)	148. (2)
149. (3)	150. (2)	151. (1)	152. (4)
153. (1)	154. (2)	155. (3)	156. (2)
157. (3)	158. (2)	159. (1)	160. (1)
161. (3)	162. (1)	163. (2)	164. (3)
165. (2)	166. (4)	167. (3)	168. (2)
169. (2)	170. (4)	171. (2)	172. (1)
173. (3)	174. (1)	175. (1)	176. (4)
177. (1)	178. (3)	179. (4)	180. (2)
181. (2)	182. (3)	183. (3)	184. (4)
185. (1)	186. (2)	187. (1)	188. (1)
189. (1)	190. (3)	191. (4)	192. (2)
193. (2)	194. (3)	195. (1)	196. (3)
197. (1)	198. (1)	199. (3)	200. (1)

1. Manganese is required in :
   (1) Plant cell wall formation
   (2) Photolysis of water during photosynthesis
   (3) Chlorophyll synthesis
   (4) Nucleic acid synthesis
2. Polyethylene glycol method is used for :
   (1) Biodiesel production
   (2) Seedless fruit production
   (3) Energy production from sewage
   (4) Gene transfer without a vector
3. The floral formula $\oplus$ ⚥ $K_{(5)}\ \overset{\frown}{C_{(5)}A_5}\ G(2)$ is that of :
   (1) Soybean (2) Sunnhemp
   (3) Tobacco (4) Tulip
4. Which one is the wrong pairing for the disease and its causal organism ?
   (1) Black rust of wheat - Puccinia graminis
   (2) Loose smut of wheat - Ustilago nuda
   (3) Root-knot of vegetables - Meloidogyne sp
   (4) Late blight of potato - Alternaria solani
5. A fruit developed from hypanthodium inflorescence is called.
   (1) Sorosis (2) Syconus
   (3) Caryopsis (4) Hesperidium
6. One of the synthetic auxin is :
   (1) IAA (2) GA
   (3) IBA (4) NAA
7. Which of the following plant species you would select for the production of bioethanol ?
   (1) Zea mays (2) Pongamia
   (3) Jatropha (4) Brassica
8. Which one of the following has maximum genetic diversity in India ?
   (1) Mango (2) Wheat
   (3) Tea (4) Teak
9. Oxygenic photosynthesis occurs in :
   (1) Oscillatoria (2) Rhodospirillum
   (3) Chlorobium (4) Chromatium
10. Which one of the following plants is monoecious?
    (1) Pinus (2) Cycas
    (3) Papaya (4) Marchantia
11. Cyclic photophosphorylation results in the formation of
    (1) ATP and NADPH (2) ATP, NADPH and O_2
    (3) ATP (4) NADPH
12. Anatomically fairly old dicotyledonous root is distinguished from the dicotyledonous stem by
    (1) Absence of secondary phloem
    (2) Presence of cortex
    (3) Position of protoxylem
    (4) Absence of secondary xylem
13. Plasmodesmata are :
    (1) Locomotary strucrures
    (2) Membranes connecting the nucleus with plasmalemma
    (3) Connections between adjacent cells
    (4) Lignified cemented layers between cells
14. Phylogenetic system of classification is based on :
    (1) Morphological features
    (2) Chemical constituents
    (3) Floral characters
    (4) Evolutionary relationships
15. Semiconservative replication of DNA was first demonstrated in :
    (1) Escherichia coli
    (2) Streptococcus pneumoniae
    (3) Salmonella typhimurium
    (4) Drosophila melonogaster
16. Which one of the following is correct pairing of a body part and the kind of muscle tissue that moves it ?
    (1) Biceps of upper arm - Smooth muscle fibres
    (2) Abdominal wall - smooth muscle
    (3) Iris - Involuntary smooth muscle
    (4) Heart wall - Involuntary unstriated muscle
17. The epithelial tissue present on the inner surface of bronchioles and fallopian tubes is :
    (1) Glandular (2) Ciliated
    (3) Squamous (4) Cuboidal
18. Which one of the following groups of animals is bilaterally symmetrical and triploblastic ?
    (1) Aschelminthes (round worms)
    (2) Ctenophores (3) Sponges
    (4) Coelenterates (Cnidarians)
19. Which one of the following is the correct matching of the events occurring during menstrual cycle ?
    (1) Proliferative phase : Rapid regeneration of myometrium and maturation of Graafian follicle.
    (2) Development of corpus luteum : Secretory phase and increased secretion of progesterone.
    (3) Menstruation : breakdown of myometrium and ovum not fertilised.
    (4) Ovulation : LH and FSH attain peak level and sharp fall in the secretion of progesterone.

20. What is true about Bt toxin ?
(1) Bt protein exists as active toxin in the Bacillus.
(2) The activated toxin enters the ovaries of the pest to sterillise it and thus prevent its multiplication.
(3) The concerned Bacillus has antitoxins.
(4) The inactive protoxin gets converted into active form in the insect gut.

21. Peripatus is a connecting link between :
(1) Mollusca and Echinodermata
(2) Annelida and Arthropoda
(3) Coelenterata and Porifera
(4) Ctenophora and platyhelminthis

22. Seminal plasma in humans is rich in :
(1) fructose and calcium but has no enzymes
(2) glucose and certain enzymes but has no calcium.
(3) fructose and certain enzymes but poor in calcium.
(4) fructose, calcium and certain enzymes.

23. The cell junctions called tight, adhering and gap junctions are found in :
(1) Connective tissue (2) Epithelial tissue
(3) Neural tissue (4) Muscular tissue

24. What will happen if the stretch receptors of the urinary bladder wall are totally removed ?
(1) Micturition will continue
(2) Urine will continue to collect normally in the bladder.
(3) There will be no micturition
(4) Urine will not collect in the bladder.

25. If a live earthworm is pricked with a needle on its outer surface without damaging its gut, the fluid that comes out is :
(1) coelomic fluid (2) haemolymph
(3) slimy mucus (4) excretory fluid

26. The most popularly known blood grouping is the ABO grouping. It is named ABO and not ABC, because 'O' in it refers to having.
(1) over dominance of this type on the genes for A and B types
(2) one antibody only-either anti-A or anti-B on the RBCs
(3) No antigens A and B on RBCs
(4) other antigens besides A and B on RBCs

27. A person likely to develop tetanus is immunised by administering :
(1) Preformed antibodies
(2) Wide spectrum antibiotics
(3) Weakened germs
(4) Dead germs

28. Alzheimer disease in humans is associated with the deficiency of :
(1) glutamic acid
(2) acetylcholine
(3) gamma aminobutyric acid (GABA)
(4) dopamine

29. Biochemical Oxygen Demand (BOD) in a river water :
(1) has no relationship with concentration of oxygen in the water.
(2) gives a measure of salmonella in the water.
(3) increases when sewage gets mixed with river water.
(4) remains unchanged when algal bloom occurs.

30. The genetic defect - adenosine deaminase (ADA) deficiency may be cured permanently by :
(1) Locomota
(1) administering adenosine deaminase activators.
(2) introducing bone marrow cells producing ADA into cells at early embryonic stages.
(3) enzyme replacement therapy.
(4) periodic infusion of genetically engineered lymphocytes having functional ADA cDNA.

31. Cytoskeleton is made up of :
(1) Callose deposits
(2) Cellulosic microfibrils
(3) Proteinaceous filaments
(4) Calcium carbonate granules

32. An example of axile placentation is :
(1) Dianthus (2) Lemon
(3) Marigold (4) Argemone

33. Which one of the following has haplontic life cycle ?
(1) Polytrichum (2) Ustilago
(3) Wheat (4) Funaria

34. Which one of the following is considered important in the development of seed habit ?
(1) Heterospory
(2) Haplontic life cycle
(3) Free-living gametophyte
(4) Dependent sporophyte

35. The annular and spirally thickened conducting elements generally develop in the protoxylem when the root or stem is :
(1) elongating (2) widening
(3) differentiating (4) maturing

36. The correct sequence of plants in a hydrosphere is :
(1) Volvox → Hydrilla → Pistia → Scirpus → Lantana → Oak
(2) Pistia → Volvox → Scirpus → Hydrilla → Oak → Lantana
(3) Oak → Lantana → Volvox → Hydrilla → Pistia → Scirpus
(4) Oak → Lantana → Scirpus → Pistia → Hydrilla → Volvox

37. Stroma in the chloroplasts of higher plant contains :
(1) Light-dependent reaction enzymes
(2) Ribosomes
(3) Chlorophyll
(4) Light-independent reaction enzymes

38. Which one of the following is a vascular cryptogam ?
(1) Ginkgo (2) Marchantia
(3) Cedrus (4) Equisetum

39. Guard cells help in :
(1) Transpiration
(2) Guttation
(3) Fighting against infection
(4) Protection against grazing

40. Vegetative propagation in mint occurs by :
(1) Offset (2) Rhizome
(3) Sucker (4) Runner

41. Cotyledons and testa respectively are edible parts in :
(1) walnut and tamarind
(2) french bean and coconut
(3) cashew nut and litchi
(4) groundnut and pomegranate

42. The correct sequence of spermatogenetic stages leading to the formation of sperms in a mature human testis is :
(1) spermatogonia - spermatocyte - spermatid - sperms
(2) spermatid - spermatocyte - spermatogonia - sperms
(3) spermatogonia - spermatid - spermatocyte- sperms
(4) spermatocyte - spermatogonia- spermatid - sperms.

43. Palisade parenchyma is absent in leaves of :
(1) Mustard (2) Soybean
(3) Gram (4) Sorghum

44. In barley stem vascular bundles are :
(1) closed and scattered
(2) open and in a ring
(3) closed and radial
(4) open and scattered

45. In the case of peppered moth (Biston betularia) the black-coloured form became dominant over the light-coloured form in England during industrial revolution. This is an example of :
(1) appearance of the darker coloured individuals due to very poor sunlight
(2) protective mimicry
(3) inheritance of darker colour character acquired due to the darker environment
(4) natural selection whereby the darker forms were selected

46. When breast feeding is replaced by less nutritive food low in proteins and calories; the infants below the age of one year are likely to suffer from :
(1) Rickets (2) Kwashiorkor
(3) Pellagra (4) Marasmus

47. A young infant may be feeding entirely on mother's milk which is white in colour but the stools which the infant passes out is quite yellowish. What is this yellow colour due to ?
(1) Bile pigments passed through bile juice
(2) Undigested milk protein casein
(3) Pancreatic juice poured into duodenum
(4) Intestinal juice

48. Which one of the following statements is true regarding digestion and absorption of food in humans ?
(1) Fructose and amino acids are absorbed through intestinal mucosa with the help of carrier ions like Na^+
(2) Chylomicrons are small lipoprotein particles that are transported from intestine into blood capillaries.
(3) About 60% of starch is hydrolysed by salivary amylase in our mouth.
(4) Oxyntic cells in our stomach secrete the proenzyme pepsinogen.

49. The letter T in T-lymphocyte refers to :
(1) Thalamus (2) Tonsil
(3) Thymus (4) Thyroid

50. Removal of introns and joining the exons in a defined order in a transcription unit is called :
(1) Tailing (2) Transformation
(3) Capping (4) Splicing

51. Which one of the following pairs of animals comprises 'jawless fishes' ?
(1) Mackerals and Rohu
(2) Lampreys and hag fishes
(3) Guppies and hag fishes
(4) Lampreys and eels

52. A health disorder that results from the deficiency of thyroxine in adults and characterised by (i) a low metabolic rate, (ii) increase in body weight and (iii) tendency to retain water in tissues is :
(1) simple goitre (2) myxoedema
(3) cretinism (4) hypothyroidism

53. In a standard ECG which one of the following alphabets is the correct representation of the respective activity of the human heart ?
(1) S-start of systole
(2) T- end of diastole
(3) P - depolarisation of the atria
(4) R - repolarisation of the ventricles

54. Uric acid is the chief nitrogenous component of the excretory products of :
(1) Earthworm (2) Cockroach
(3) Frog (4) Man

55. DDT residues are rapidly passed through food chain causing biomagnification because DDT is :
(1) moderately toxic
(2) non-toxic to aquatic animals
(3) water soluble (4) lipo soluble

56. Select the incorrect statement from the following :
(1) Galactosemia is an inborn error of metabolism
(2) Small population size results in random genetic drift in a population
(3) Baldness is a sex-limited trait
(4) Linkage is an exception to the principle of independent assortment in heredity

57. Which one of the following is the most likely root cause why menstruation is not taking place in regularly cycling human female ?
(1) maintenance of the hypertrophical endometrial lining
(2) maintenance of high concentration of sex hormones in the blood stream
(3) retention of well-developed corpus luteum
(4) fertilisation of the ovum

58. Globulins contained in human blood plasma are primarily involved in :
(1) osmotic balance of body fluids
(2) oxygen transport in the blood
(3) clotting of blood
(4) defence machanisms of body.

59. Which one of the following is the correct matching of three items and their grouping category ?

Items	Group
(1) ilium, ischium, pubis – coxal bones of pelvic girdle	
(2) actin, myosin, rhodopsin – muscle proteins	
(3) cytosine, uracil, thiamine – pyrimidines	
(4) malleus, incus, cochlea – ear ossicles	

60. Whose experimenis cracked the DNA and discovered unequivocally that a genetic code is a "triplet" ?
(1) Hershey and Chase
(2) Morgan and Sturtevant
(3) Beadle and Tatum
(4) Nirenberg and Mathaei

61. The normal eye colour in Drosophila is red. But mutants occur having white eye and also different shades ranging between white and red which are all recessive to red, while white colour is recessive to all others. This phenomenon is due to :
(1) pseudodominance (2) pseudoallelism
(3) co-dominance (4) polygenesis

62. Albinism in plants is associated with :
(1) epistasis (2) recessive lethal
(3) dominant lethal
(4) chromosome duplication

63. In sweetpeas (Lathyrus odoratus) gene C or P alone produces white flower, whereas both C and P are needed to produce purple-coloured-flower. In a particular cross between two white-flowered plants, the offsprings were one-half purple and one-half white. The possible genotypes of the parents is :
(1) $C_c P_p \times ccP_p$ (2) $CC_{pp} \times ccPP$
(3) $ccP_p \times CC_{pp}$ (4) $C_{cpp} \times ccP_p$

64. Match List-I (Crop plants) with List-II (Ploidy levels of the plants) and select the correct answer using the codes given below the lists :

List-I	List-II
A. Bread wheat	1. Diploid
B. Pea	2. Triploid
C. Sea-island cotton	3. Allo-hexaploid
D. Banana	4. Allo-tetraploid

Codes :

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

65. Which of the following pairs of definitions and terms are correctly matched ?

(1) The immediate effect of Pollen on the character of endosperm	Xenia
(2) A cytoplasmic-borne unit of heredity	Plasmogene
(3) A haploid chromosome in an otherwise normal diploid individual	Monosome

(4) Both (1) and (3)

66. The condition in which a single gene influences more than one trait is known as
(1) epistasis (2) pleiotropy
(3) polarity mutation (4) phenocopy

67. Which of the following type(s) of male sterility is/are used in commercial seed production of double cross hybrid maize ?
(1) Cytoplasmic alone (2) Genetic alone
(3) Cytoplasmic and genetic
(4) Cytoplasmic and genetic with restorers

68. The composite veriety has an advantage over the hybrid variety in respect of :
(1) yield (2) synthesis
(3) homogeneity (4) seed production

69. Which of the following statements is/are correct ?
(1) Wheat is self-pollinated
(2) F_1 seeds alone are used for cultivation in both hybrid and composite varieties.
(3) Hybrid vigour is expected to be more pronounced in bajra than in Bengal gram.
(4) All of the above

70. Consider the following statements :
Triticale
(1) is a cross between species of two different genera Secale cereale (2n = 14) and Triticum vulgare (2n = 42).
(2) is amphidiploid with 56 chromosomes.
(3) has high degree of fertility.
(4) (1) and (2) are correct

71. Match List-I (Crop) with List-II (Variety) and select the correct answer using the codes given below the lists :

	List-I		List-II
A.	Cauliflower	1.	White Vienna
B.	Cabbage	2.	Golden acre
C.	Knolkhol	3.	Japanese white
D.	Radish	4.	Dania

Codes :

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

72. Wheat is of
(1) Mediterranean origin
(2) Indian origin
(3) Mexican origin
(4) Chinese origin

73. The components of synthetic population would have already been tested for
(1) specific combining ability
(2) genetic advance
(3) general combining ability
(4) both general and specific combining ability.

74. The popular variety, Ganga Safed-2 of maize is a
(1) single cross hybrid
(2) double cross hybrid
(3) 3-way cross hybrid
(4) double topcross hybrid

75. The mutation induced nullisomic variety of sugarcane is
(1) Co — 8504 (2) Co — 8153
(3) Co — 527 (4) Co — 8152

76. In pedigree method of breeding, single plants are selected in which one of the following generations?
(1) F_5 (2) F_3
(3) F_2 (4) F_1

77. Pointed gourd (Tricosanthes dioica) is a
(1) monoecious plant (2) hermaphrodite plant
(3) dioecious plant (4) polygamous plant

78. The family Anacardiaceae to which mango belongs, contains a number of plants of horticultural interest. List I contains the name of the plants and List II contains their botanical names. Match List I with List II and select the correct answer using the codes given below the list :

	List-I		List-II
A.	Cashew	1.	Schinus molle
B.	Hogplum	2.	Buchanania latifolia
C.	Small nut (Chiraunji	3.	Spondias mangifera
D.	Pepper-tree	4.	Anacardium Accidentale

Codes :

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

79. Pusa Delicious a gynodioecious variety of papaya has which of the following sex forms ?
(1) Pistillate (2) Staminate
(3) Hermaphrodite (4) Both (1) and (3)

80. Which of the following reason/reasons is/are responsible for seedlessness in Pusa Bedana cultivar of watermelon ?
(1) Vines do not have male flowers
(2) Male and female flowers do not open at one time.
(3) Vines suffer from deficiency of Boron.
(4) Cultivar is triploid in genetic constitution.

81. Which one of the following genetic factors is responsible for poor fruit set in custard apple?
(1) Heterostyly (2) Dioecious nature
(3) Dichogamy (4) Self-incompatibility

82. Which of the following species are climbers ?
(1) Beaumontia grandiflora
(2) Mussaenda erythrophylla
(3) Lonicera japonica
(4) Both (1) and (3)

83. Match List-I which List-II and select the correct answer using the codes given below the lists :

List-I (Name of ornamental plants)	List-II (Colour of flowers)
A. Tabebuia Chrysantha	1. Red
B. Amherstia nobilis	2. Yellow
C. Monodora grandiflora	3. Bluish purple
D. Jacaranda acutifolia	4. Greenish-yellow

Codes :

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

84. Which of the following pairs are sets of an orchard crop and a good companion crop ?
(1) Mango and pipalamool
(2) Sapota and sugarcane
(3) Banana and turmeric
(4) Both (1) and (3)

85. Which one of the following types of vegetable gardens normally has the highest crop intensity?
(1) Truck garden
(2) Kitchen garden
(3) Vegetable garden for processing
(4) Market garden

86. Match List-I with List-II and select the correct answer using the codes given below the lists :

List-I (*Fruit*)	List-II (*Vitamin A/Carotene per 100 g edible part*)
A. Ripe mango	1. 1710 I.U.
B. Ripe papaya	2. 2020 I.U.
C. Persimmon (ripe)	3. 600 I.U.
D. Dates (ripe)	4. 4800 I.U.

Codes :

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

87. Match List-I with List-II and select the correct answer using the codes given below the lists :

List-I (*Crop*)	List-II (*Characteristic*)
A. Tomato	1. Papain
B. Persimmon	2. Lycopine
C. Chillies	3. Soluble tannin
D. Papaya	4. Capsicin

Codes :

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

88. Match List-I (Fruit crop) with List-II (Physiological disorders during storage) and select the correct answer using the codes given below the lists :

List-I	List-II
A. Apple	1. Cold scald
B. Peach	2. Bitter pit
C. Citrus	3. Chilling injury
D. Mango	4. Woolliness

Codes :

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

89. What is the correct sequence of the following steps in the preparation of pineapple jam ?
(1) Cooking the fruit
(2) Addition of pectin
(3) Addition of sugar
(4) Boiling and removal of scum

90. Match List-I (Crop species) with List-II (Serious disease) and select the correct answer using the codes given below the lists :

List-I	List-II
A. Rice	1. Green ear
B. Wheat	2. Bacterial leaf blight
C. Maize	3. Stalk rot
D. Bajra	4. Alternaria leaf blight

Codes :

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

91. Which of the following pairs of wheat rusts and alternate hosts are correctly matched ?
(1) Puccinia graminis tritici..... Berberis vulgaris
(2) Puccinia recondita tritici ..... Thalictrum species
(3) Puccinia striiformis ..... Phalaris minor
(4) Both (1) and (2)

92. Match List-I (Crop disease) with List-II (Pathogen) and select the correct answer using the codes given below the lists :

List-I	List-II
A. Tikka disease of groundnut	1. Erysiphe graminis f.sp. hordei
B. Powdery mildew of barley	2. Puccinia striiformis
C. Yellow rust of wheat	3. Plasmopara viticola
D. Downy mildew of grapes	4. Cercospora personata

Codes :

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

93. Which one of the following pairs of crop and disease is correctly matched ?
(1) Cabbage — Early blight
(2) Cucumber — Club root
(3) Potato — Black ward
(4) Tomato — White rust

94. Which one of the following pairs is NOT correctly matched ?
(1) Karnal bunt of wheat – *Neovossia horrida*
(2) False smut of rice – *Ustilaginaidea virens*
(3) Hill bunt of wheat – *Tilletia foetida*
(4) Ear cockle of wheat – *Anguina tritici*

95. Plant pathogenic viroids contain
(1) RNA only
(2) RNA and protein coat
(3) DNA and protein coat
(4) DNA only

96. Loose smut of wheat is a/an
(1) externally seed-borne disease
(2) externally seed-borne and soil-borne disease
(3) air-borne disease
(4) internally seed-borne disease

97. Which of the following are the sources of survival of the wilt pathogen of sugarcane in India ?
(1) Ratoon of infected crop
(2) Diseased plant debris
(3) Setts of diseased crop
(4) All of the above

98. Which one of the following is the correct order in which they appear during biocontrol operations ?
(1) Parasite, Release, Mass rearing, Parasitism
(2) Mass rearing, Parasite, Release, Parasitism
(3) Release, Mass rearing, Parasite, Parasitism
(4) Parasite, Mass rearing, Release, Parasitism

99. Mycoplasma is sensitive to
(1) penicillin (2) tetracycline
(3) calixin (4) streptomycin

100. Whorl application of granular insecticide provides effective control measure against :
(1) spotted bollworm (2) maize stem borer
(3) stem borer of paddy
(4) mango stem borer

101. Match List-I (Principles of disease control) with List-II (Practices) and select the correct answer using the codes given below the lists :

List-I	List-II
A. Exclusion	1. Spraying a common fungicide
B. Avoidance	2. Chemical seed treatment
C. Eradication	3. Isolation in time and space
D. Protection	4. Plant quarantine

Codes :

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

102. Which one of the following insecticides is capable of controlling mites as well ?
(1) Endosulfan (2) Toxaphene
(3) Cypermethrin (4) Monocrotophos

103. The safest method of disposing off the left over pesticide is, disposal by :
(1) pouring in the drain
(2) pouring in a pond
(3) pouring in a moving stream
(4) burying in the soil

104. Which of the following types of manually operated sprayers are suitable for spraying 4 to 5 metre tall plantations ?
(1) Hand compression sprayer
(2) Foot sprayer
(3) Rocking sprayer
(4) Both (2) and (3)

105. Which of the following protective measures are necessary for a person manually dusting pesticide on crop in uncertain wind conditions?
(1) Wearing plastic approns
(2) Use of plastic gloves
(3) Use of plastic shoes
(4) All of the above

106. If one gram of a pesticide formulation containing 50% active ingredient is mixed with one litre of water, what will be the concentraction of the active ingredient in the spray fluid ?
(1) 0.5 ppm (2) 5.0 ppm
(3) 50 ppm (4) 500 ppm

107. The main purpose of T and V programme is to :
(1) identify research problems
(2) bring about coordination in the administration of agricultural extension.
(3) update the technical knowledge and skills of agricultural extension workers.
(4) help farmers in the adoption of latest innovations in agriculture

108. Which one of the following pairs is correctly matched ?

(1) Common cost	Cost associated with variable reasources.
(2) Average cost	A study of returns and costs
(3) Marginal cost	Additional cost to produce an additional unit of output.
(4) Prime cost	Cost related to fixed resources.

109. Which one of the following pairs is NOT correctly matched ?

(1) Elasticity of greater than unity	Stage II of classical production production function
(2) Negative marginal product	Stage III of classical production function
(3) Negative elasticity production	Stage III of classical production function
(4) Average product decreases but is greater than arginal product	Stage II of classical production function

110. The Planning Commission in India has divided the country into different agroclimatic regions based on factors

(1) Soil characteristics
(2) Mean annual rainfall
(3) Potential evapotranspiration
(4) All of the above

111. Supose the cost A_2 on a farm is Rs. 26,450 and the rent of the leased-in land is Rs. 2,250. Cost A_1 on this farm will be

(1) Rs. 24,000 (2) Rs. 24,200
(3) Rs. 28,000 (4) Rs. 28,700

112. Consider the following statements :
Diversification of farm production helps farmers through stabilising

(1) agricultural prices
(2) farm incomes
(3) agricultural production
(4) Both (1) and (3)

113. A normative farm plan is one which the farmer

(1) has already put into operation on his farm
(2) should adopt during the current Five Year Plan period
(3) had actually adopted in the earlier Five year Plan periods
(4) should adopt

114. In mixedd farming, the contribution of livestock to gross farm income is

(1) at least 10% (2) at least 30%
(3) at least 40% (4) more than 50%

115. Match List-I with List -II and select the correct answer using the codes given below the lists:

List–I (Crop)	List–II (Event)
(1) Sunflower	1. Gypsum application
(2) Groundnut	2. Potash application
(3) Coconut	3. Poor seed setting
(4) Soybean	4. Phosphate application

Codes :

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

116. Match List-I with List-II and select the correct answer using the codes given below the lists:

List–I (Crop)	List–II (Term used in relation to the crop)
(1) Corn	1. Retting
(2) Cotton	2. Tasselling
(3) Peanut	3. Ginning
(4) Jute	4. Pegging

Codes :

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

117. Match List-I (Host legume) with List-II (Rhizobium species) and select the correct answer using the codes given below the lists:

List–I	List–II
(1) Fenugreek	1. R. meliloti
(2) Clovers	2. R. phaseoli
(3) Peas	3. R. trifolii
(4) Beans	4. R. leguminosarum

Codes :

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

118. Crop rotation is defined as a

(1) system of growing different kinds of crop on the same land
(2) system of growing different crops in succession on the same land
(3) method of growing different crops
(4) system of growing the same crop on different fields

119. 'Mauritius', 'Mozambique' and 'Coromandel' are the varieties of
(1) chillies (2) mango
(3) pineapple (4) groundnut

120. Match List-I (Crop) with List-II (Variety) and select the correct answer using the codes given below the lists:

List-I		List-II
A.	Pigeon-pea	1. Pusa 2-21
B.	Rice	2. Karan 521
C.	Maize	3. Bahar
D.	Barley	4. Prabhat

Codes :

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

121. When irrigation water is available for two irrigations only, the wheat crop should receive these at
(1) CRI and late tillering stages
(2) CRI and boot stages
(3) CRI and flowering stages
(4) CRI and milk stages

122. Dehaulming in potato is done to obtain
(1) higher yield
(2) quality seed tuber
(3) higher starch content
(4) higher protein content

123. Match List-I (Herbicides) with List-II (Chemical group) and select the correct answer using the codes given below the lists :

List-I		List-II
A.	Dalapon	1. Quaternary ammonium compound
B.	2, 4, 5-T	2. Symmetrical trizenes
C.	Simazine	3. Phenoxy compounds
D.	Paraquat	4. Aliphatic acids

Codes :

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

124. A farmer is to select a herbicide for controlling Cyperus species and dicot weeds on his sugarcane crop. The crop is followed, after its, ratoon, by dhaincha in the kharif and lentils in the rabi. In this case, the herbicide of choice would be
(1) atrazine (2) dalapon
(3) diuron (4) 2, 4 - D

125. Which one of the following system needs irrigation throughout the year ?
(1) Diara land cropping system
(2) Intercropping system
(3) Mixed cropping system
(4) Multiple cropping system

126. On the basis of total mass, the relative abundance of the given elements in the earth's crust is such that
(1) $Si > O_2 > Fe > Al$
(2) $O_2 > Al > Si > Fe$
(3) $O_2 > Si > Fe > Al$
(4) $O_2 > Si > Al > Fe$

127. Which one of the following sets of soil conditions is more suitable for plant growth?
(1) Sandy soils with high aeration and low water holding capacity
(2) Clay soils with high water holding capacity and low aeration
(3) Organic soils with high water holding capacity and low aeration
(4) Loamy soils with medium aeration and medium water holding capacity

128. Consider the following phenomena/events:
(1) Weathering
(2) Biogrowth
(3) Soil development
(4) Profile differentiation
The correct chronogical saquence of these phenomena/events is
(1) 2, 1, 3, 4 (2) 1, 2, 4, 3
(3) 1, 2, 3, 4 (4) 2, 1, 4, 3

129. Consider the following materials:
(1) Montmorillonite (2) Humus
(3) Kaolinite (4) Illite
The correct sequence of these materials it decreasing order of their CEC is
(1) 1, 2, 3, 4 (2) 2, 1, 3, 4
(3) 2, 1, 4, 3 (4) 1, 2, 4, 3

130. Phosphorus fixation refers to the phenomenon of
(1) absorption of phosphorus by the plant and synthesis of biological compounds
(2) leaching of phosphorus from soil by percolating waters
(3) conversion of soluble phosphorus into plant unavailable forms
(4) anion exchange with colloidal constituents of soil

131. Which one of the following pairs is NOT correctly matched ?

(1) Expanding type of clay minerals	Higher water holding capacity
(2) High calcium content in soil	Iron chlorosis
(3) Water inundated soils	High nitrogen mineralisation
(4) Sandy soils	Split application of fertilizers

132. Tolerance to soil salinity of the given set of crops is such that
(1) barely > wheat > upland paddy > beans
(2) barely > wheat > beans > upland paddy
(3) wheat > barely > beans > upland paddy
(4) wheat > barely > upland paddy > beans

133. Hydraulic conductivity of soils varies directly with
(1) capillary porosity
(2) non-capillary porosity
(3) total porosity
(4) water holding capacity

134. There is a net increase in the mineralisation of organic nitrogen in soil when
(1) C : N ratio is 20 to 30 : 1
(2) C : N ratio is below 20 : 1
(3) C : N ratio is above 30 : 1
(4) nitrogen is taken up by the crops

135. What would be the concentration of nutrients in plants when they are suffering from hidden hunger ?
(1) Above deficiency symptom zone
(2) Below profitable yield zone
(3) Below deficiency symptom zone
(4) Both (1) and (2)

136. A soil with 20 me/100 g. CEC and 5 me/100 g exchangeable H will have a base saturation of
(1) 25.0% (2) 75.0%
(3) 80.0% (4) 133.3%

137. Match List-I (Biofertilizers) with List-II (Properties) and select the correct answer using the codes given below the lists :

List-I	List-II
A. *Azospirillum*	1. Helps in phosphorus uptake
B. Azotobacter	2. Floating aquatic fern
C. VAM	3. Grows on and inside the roots of graminaceous crops
D. Azolla	4. Free-living nitrogen fixing bacterium

Codes :

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

138. In respect of a sugarcane crop to be grown in an acidic soil having high P-fixing capacity, the fertilizer of choice would be
(1) triple superphosphate
(2) finely ground rock phosphate
(3) coarse rock phosphate
(4) superphosphate

139. For preparing a mixed fertilizer, 100 kg of ammonium sulphate and 125 kg. of single superphosphate were mixed. 25 kg. of filler was added to this mixture. In terms of N - P_2O_5 - K_2O, the fertilizer grade of this mixture will be
(1) 5 - 5 - 0 (2) 5 - 10 - 0
(3) 8 - 8 - 0 (4) 10 - 10 - 0

140. Use of materials like sulphur, polyform UF, isobutylidene diurea etc. improves fertilizer use efficiency. When such additives are used, the N-fertilizers are termed as
(1) prilled urea
(2) controlled release nitrogenous fertilizers
(3) slow nitrifying N-fertilizers
(4) complex fertilizers

141. Consider the following statements regarding enymes in living plants :
(1) They are specific.
(2) They are sensitive to heat.
(3) The reactions caused by enzymes are reversible.
(4) All of the above are correct

142. Which one of the following plant nutrients is useful in increasing resistance to diseases and insect pests ?
(1) Calcium (2) Phosphorus
(3) Nitrogen (4) Potassium

143. Parts of cell walls in plants are given in List I and their distinctive components are given in List II. Match the two lists and select the correct answer using the codes given below the lists :

List-I	List-II
A. Primary wall	1. Hemicellulose
B. Secondary wall	2. Lignin
C. Middle lamella	3. Lipids and proteins
D. Plasma lemma	4. Pectin

Codes :

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

144. Soils with high pH are generally *deficient* in
(1) Zn and Mn (2) B and Fe
(3) Cu and Mo (4) Ca and Mg

145. During the conversion of each molecule of glucose into pyruvic acid through the glycolytic cycle
(1) one molecule of ATP is consumed and two molecules of ATP are generated
(2) two molecules of ATP are consumed and two molecules of ATP are generated
(3) one molecule of ATP is consumed and four molecules of ATP are generated
(4) two molecules of ATP are consumed and four molecules of ATP are generated

146. Which is the correct chronological sequence of the following discoveries related to mechanism of photosynthesis ?
(1) Calvin's cycle
(2) Hatch and Slack cycle
(3) Hill reaction
(4) Red drop
Choose the correct answer using the codes given below :
Codes :
(1) 3, 4, 2, 1 (2) 4, 3, 2, 1
(3) 3, 4, 1, 2 (4) 4, 3, 1, 2

147. Match List-I (Plant growth regulators) with List-II (Possible precursors) and select the correct answer using the codes given below he lists :

List-I	List-II
A. ABA	1. Tryptophan
B. Ethylene	2. Terpenoids
C. GA_3	3. Fatty acids
D. IAA	4. Carotenoids

Codes :

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

148. Which of the following chemicals are responsible for the induction of female flower?
(1) Ethephone (2) GA_3
(3) NAA (4) Both (1) and (3)

149. The main function of maleic hydrazide is considered to be that of a/an
(1) antiauxin
(2) antagonist to gibberellin
(3) inhibitor
(4) growth retardant

150. The recessive genes located on X -chromosome in humans are always
(1) Expressed in males
(2) Expressed in females
(3) Lethal (4) Sub-lethal

151. Viruses that infect bacteria, multiply and cause their lysis, are called
(1) Lytic (2) Lysogenic
(3) Lysozymes (4) Lipolytic

152. The telomeres of eukaryotic chromosomes consist of short sequences of
(1) Adenine rich repeats
(2) Guanine rich repeats
(3) Thymine rich repeats
(4) Cytosine rich repeats

153. Extranuclear inheritance is a consequence of presence of genes in
(1) Ribosomes and chloroplast
(2) Lysosomes and ribosomes
(3) Mitochondria and chloroplasts
(4) Endoplasmic reticulum and mitochondria

154. During transcription, if the nucleotide sequence of the DNA strand that is being coded to ATACG, then the nucleotide sequence in the mRNA would be
(1) UAUGC (2) UATGC
(3) TATGC (4) TCTGG

155. Restriction endonucleases
(1) Are used for *in vitro* DNA synthesis
(2) Are synthesized by bacteria as part of their defense mechanism
(3) Are present in mammalian cells for degradation of DNA when the cell dies
(4) Are used in genetic engineering for ligating two DNA molecules

156. Which of the following statements is *not* true for retroviruses?
(1) The genetic material in mature retroviruses is RNA
(2) Retroviruses are causative agents for certain kinds of cancer in man
(3) DNA is not present at any stage in the life cycle of retroviruses
(4) Retroviruses carry gene for RNA-dependent DNA polymerase

157. Crossing over that results in genetic recombination in higher organisms occurs between
(1) Two daughter nuclei
(2) Two different bivalents
(3) Sister chromatids of a bivalent
(4) Non-sister chromatids of a bivalent

158. In a plant, red fruit *(R)* is dominant over yellow fruit *(r)* and tallness (n is dominant over *shortness(t)*. If a plant with *RRTt* genotype is crossed with a plant that is *rrtt*
(1) 75% will be tall with red fruit
(2) All the offspring will be tall with red fruit
(3) 25% will be tall with red fruit
(4) 50% will be tall with red fruit

159. The *Ti* plasmid, is often used for making transgenic plants. This plasmid is found in
(1) *Agrobacterium*
(2) Yeast as a 2 urn plasmid
(3) *Azotobacter*
(4) *Rhizobium* of the roots of leguminous plants

160. Plants adapted to low light intensity have
(1) More extended root system
(2) Leaves modified to spines
(3) Larger photosynthetic unit size than the sun plants
(4) Higher rate of CO_2 fixation than the sun plants

161. During replication of a bacterial chromosome DNA synthesis starts from a replication origin site and
(1) Moves in one direction of the site
(2) Moves in bi-directional way
(3) RNA primers are involved
(4) Is facilitated by telomerase

162. After a mutation at a genetic locus the character of an organism changes due to the change in
(1) Protein synthesis pattern
(2) RNA transcription pattern
(3) Protein structure
(4) DNA replication

163. One of the parents of a cross has a mutation in its mitochondria. In that cross, that parent is taken as a male. During segregation of F2 progenies that mutation is found in
(1) All the progenies
(2) Fifty percent of the progenies
(3) One-third of the progenies
(4) None of the progenies

164. In the ABO system of blood groups, if both antigens are present but no antibody, the blood group ofthe individual would be
(1) AB (2) A
(3) B (4) 0

165. A free living nitrogen-fixing cyanobacterium which can also form symbiotic association with the water fern *Azolla* is
(1) *Nostoc* (2) *Anabaena*
(3) *Tolypothrix* (4) *Chlorella*

166. A major component of gobar gas is
(1) Ethane (2) Butane
(3) Ammonia (4) Methane

167. Which one of the following pairs is *not* correctly matched?
(1) *Spirulina* Single cell protein
(2) *Rhizobium* Biofertilizer
(3) *Streptomyces* Antibiotic
(4) *Serratia* Drug addiction

168. Which one of the following is *not* correctly matched?
(1) *Aedes aegypti* Yellow fever
(2) *Anopheles culifacies* Leishmaniasis
(3) *Glossina palpalis* Sleeping sickness
(4) *Culex pipiens* Filariasis

169. When a fresh-water protozoan possessing a contractile vacuole, is placed in a glass containing marine water, the vacuole will
(1) Increase in size
(2) Decrease in size
(3) Increase in number
(4) Disappear

170. A normal woman, whose father was colour-blind is married to a normal man. The sons would be Phenetic classification of organisms is based on
(1) All normal (2) All colour-blind
(3) 75% colour-blind (4) 50% colour-blind

171. In transgenics, expression of transgene in target tissue is determined by
(1) Promoter (2) Reporter
(3) Enhancer (4) Transgene

172. An ovule which becomes curved so that the nucellus and embryo sac lie at right angles to the funicle is
(1) Anatropous (2) Orthotropous
(3) Hemitropous (4) Campylotropous

173. Lichens are well known combination of an alga and a fungus where fungus has
(1) A parasitic relationship with the alga
(2) A symbiotic relationship with the alga
(3) A saprophytic relationship with the alga
(4) An epiphytic relationship with the alga

174. Angiosperms have dominated the land flora primarily because of their
(1) Nature of self pollination
(2) Domestication by man
(3) Power of adaptability in diverse habitat
(4) Property of producing large number of seeds

175. When a diploid female plant is crossed with a tetraploid male, the ploidy of endosperm cells in the resulting seed is
(1) Diploidy (2) Triploidy
(3) Tetraploidy (4) Pentaploidy

176. Which one of the following hormones is a modified amino acid?
(1) Prostaglandin (2) Estrogen
(3) Epinephrine (4) Progesterone

177. In the resting state of the neural membrane, diffusion due to concentration gradients, if allowed, would drive
(1) Na^+ into the cell

(2) Na^+ out the cell
(3) K^+ into the cell
(4) K^+ and Na^+ out the cell

178. A terrestrial animal must be able to
(1) Actively pump salts out through the skin
(2) Excrete large amounts of salts in urine
(3) Excrete large amounts of water in urine
(4) Conserve water

179. Cancer cells are more easily damaged by radiation than normal cells because they are
(1) Different in structure
(2) Non-dividing
(3) Starved of mutation
(4) Undergoing rapid division

180. Certain characteristic demographic features of developing countries are
(1) High infant mortality, low fertility, uneven population growth and a very young age distribution
(2) High mortality, high density, uneven population growth and a very old age distribution
(3) High fertility, low or rapidly falling mortality rate, rapid population growth and a very young age distribution
(4) High fertility, high density, rapidly rising mortality rate and a very young age distribution

181. Which one of the following pairs correctly matches a hormone with a disease resulting from its deficiency?

(1) Thyroxine	Tetany
(2) Parathyroid hormone	Diabetes mellitus
(3) Luteinizing hormone	Failure of ovulation
(4) Insulin	Diabetes insipidus

182. Duodenum has characteristic Brunner's glands which secrete two hormones called
(1) Prolactin, parathormone
(2) Estradiol, progesterone
(3) Kinase, estrogen
(4) Secretin, cholecystokinin

183. Uricotelism is found in
(1) Birds, reptiles and insects
(2) Frogs and toads
(3) Mammals and birds
(4) Fishes and fresh water protozoans

184. Mast cells of connective tissue contain
(1) Heparin and calcitonin
(2) Serotonin and melanin
(3) Vasopressin and relaxin
(4) Heparin and histamine

185. ATPase enzyme needed for muscle contraction is located in
(1) Myosin (2) Actin
(3) Actinin (4) Troponin

186. Which one of the following pairs is *not* correctly matched?

(1) Vitamin B_1	Beri-beri
(2) Vitamin B_2	Pellagra
(3) Vitamin B_{12}	Pernicious anaemia
(4) Vitamin B_6	Loss of appetite

187. When CO_2 concentration in blood increases, breathing becomes
(1) Slow and deep
(2) Faster and deeper
(3) Shallower and slow
(4) There is no effect on breathing

188. Chemically hormones are
(1) Proteins only
(2) Steroids only
(3) Biogenic amines only
(4) Proteins, steroids and biogenic amines

189. One of the following is a very unique feature of the mammalian body
(1) Four chambered heart
(2) Rib cage
(3) Homeothermy
(4) Presence of diaphragm

190. According to Oparin, which one of the following was *not* present in the primitive atmosphere of the earth?
(1) Hydrogen (2) Water vapour
(3) Methane (4) Oxygen

191. You are required to draw blood from a patient and to keep it in a test tube for analysis of blood corpuscles and plasma. Your are also provided with the following four types of test tubes. Which of them will your *not* use for the purpose?
(1) Test tube containing heparin
(2) Test tube containing sodium oxalate
(3) Test tube containing calcium bicarbonate
(4) Chilled test tube

192. Blood analysis of a patient reveals an unusually high quantity of carboxyhaemoglobin content. Which of the following conclusions is most likely to be correct?
The patient has been inhaling polluted air containing unusually high content of
(1) Carbon dioxide
(2) Carbon monoxide
(3) Carbon disulphide
(4) Chloroform

193. The cardiac pacemaker in a patient fails to function normally. The doctors find that an artificial pacemaker is to be grafted in him. It is likely that it will be grafted at the site of
(1) Sinuatrial node
(2) Atrioventricular node
(3) Atrioventricular bundle
(4) Purkinje system

194. Which of the following hormones is *not* a secretion product of human placenta?
(1) Estrogen
(2) Progesterone
(3) Human chorionic gonadotropin
(4) Prolactin

195. Injury to vagus nerve in humans is *not* likely to affect
(1) Pancreatic secretion
(2) Cardiac movements
(3) Tongue movements
(4) Gastrointestinal movements

196. Ovulation in the human female normally takes place during the menstrual cycle
(1) At the beginning of the proliferative phase
(2) At the end of the proliferative phase
(3) At the mid secretory phase
(4) Just before the end of the secretory phase

197. ELISA is used to detect viruses, where
(1) Alkaline phosphatase is the key reagent
(2) Catalase is the key reagent
(3) DNA-probes are required
(4) Souther blotting is done

198. Which one of the following precedes re-formation of the nuclear envelope during M phase of the cell cycle?
(1) Formation of the contractile ring and formation of the phragmoplast
(2) Formation of the contractile ring and transcription from chromosomes
(3) Decondensation from chromosomes and reassembly of the nuclear lamina
(4) Transcription from chromosomes and reassembly of the nuclear lamina

199. Lead concentration in blood is considered alarming if it is
(1) 4 – 6 µg/100 ml (2) 10 µg/100 ml
(3) 20 µg/100 ml (4) 30 µg/100 ml

200. In which one of the following enzymes, is copper necessarily associated as an activator?
(1) Lactic dehydrogenase
(2) Tyrosinase
(3) Carbonic anhydrase
(4) Tryptophanase

ANSWERS

1. (2)	2. (4)	3. (3)	4. (4)	5. (2)
6. (4)	7. (3)	8. (1)	9. (1)	10. (1)
11. (3)	12. (3)	13. (3)	14. (4)	15. (1)
16. (2)	17. (2)	18. (1)	19. (2)	20. (4)
21. (2)	22. (3)	23. (2)	24. (3)	25. (1)
26. (3)	27. (3)	28. (2)	29. (3)	30. (2)
31. (3)	32. (2)	33. (2)	34. (1)	35. (4)
36. (1)	37. (4)	38. (4)	39. (1)	40. (3)
41. (4)	42. (1)	43. (4)	44. (1)	45. (2)
46. (4)	47. (1)	48. (1)	49. (3)	50. (4)
51. (2)	52. (2)	53. (3)	54. (2)	55. (4)
56. (3)	57. (2)	58. (4)	59. (1)	60. (4)
61. (2)	62. (1)	63. (3)	64. (2)	65. (4)
66. (2)	67. (4)	68. (4)	69. (4)	70. (4)
71. (2)	72. (1)	73. (3)	74. (4)	75. (4)
76. (3)	77. (3)	78. (1)	79. (4)	80. (4)
81. (3)	82. (4)	83. (1)	84. (4)	85. (4)
86. (1)	87. (1)	88. (2)	89. (1)	90. (3)
91. (4)	92. (3)	93. (3)	94. (1)	95. (1)
96. (4)	97. (4)	98. (4)	99. (2)	100. (1)
101. (3)	102. (4)	103. (4)	104. (4)	105. (4)
106. (4)	107. (3)	108. (3)	109. (1)	110. (4)
111. (2)	112. (4)	113. (4)	114. (1)	115. (3)
116. (2)	117. (4)	118. (2)	119. (3)	120. (1)
121. (3)	122. (2)	123. (3)	124. (1)	125. (4)
126. (4)	127. (4)	128. (2)	129. (3)	130. (3)
131. (3)	132. (1)	133. (2)	134. (2)	135. (4)
136. (1)	137. (3)	138. (2)	139. (3)	140. (2)
141. (4)	142. (4)	143. (4)	144. (1)	145. (4)
146. (4)	147. (3)	148. (4)	149. (1)	150. (1)
151. (1)	152. (2)	153. (3)	154. (1)	155. (2)
156. (3)	157. (4)	158. (4)	159. (1)	160. (2)
161. (2)	162. (3)	163. (4)	164. (1)	165. (2)
166. (4)	167. (4)	168. (2)	169. (4)	170. (4)
171. (2)	172. (3)	173. (2)	174. (3)	175. (3)
176. (3)	177. (1)	178. (4)	179. (4)	180. (3)
181. (3)	182. (4)	183. (1)	184. (4)	185. (1)
186. (4)	187. (2)	188. (4)	189. (4)	190. (4)
191. (3)	192. (2)	193. (2)	194. (4)	195. (3)
196. (2)	197. (1)	198. (3)	199. (1)	200. (2)

EXPLANATIONS

1. (2) Mn present in OEC takes e^- from water, causing its splitting.
2. (4) One of the method of direct/vectorless gene transfer is, chemical mediated gene transfer. This involves use of PEG (polyethylene glycol).
3. (3) Soyabean and Sunnhemp have monocarpellary pistil and tulip has trimerous flower and perianth. This floral formula is characteristic to Solanaceae family, e.g. Tobacco, Potato, Tomato.
4. (4) Alternaria solani causes early blight of potato. Late blight of potato is caused by Phytophthora infestans.
5. (2) Syconus is a composite fruit developing from the whole hypanthodium inflorescence, e.g., Ficus.
6. (4) IBA and IAA are naturally occurring auxins.
7. (3) (1) The two common sources of bioethanol fuel – corn and cane sugar - have a major drawback: they are diverting food sources into fuel for vehicles. *Zea* mays is used for bio-ethanol production. (2) The advantages of *Jatropha* include its hardy nature : it does not require pesticide, manure, or irrigation to grow and it is drought resistant. *Jatropha* and Pongamia are biodiesel plants.
8. (1) About thousand varieties of mango are found in India.
   Some native *Mangifera spp. are* found in Tripura, Manipur, Mizoram and South Assam. Wild form of M. *indica* and its allied species M. *sylvetica* occur in Arunachal Pradesh, M. *khasiana* and M. pentandra in Assam.
9. (1) *Oscillatoria* is a blue green algae that uses water as a source of H^+ and e^-.
10. (1) Only Pinus is monoecious, rest all are dioecious. Monoecious means both sex organs are present on the same plant.
11. (3) Cyclic photophosphorylation used only PS-I and releases ATP only. Both ATP and NADPH are produced during non cyclic pathway.
12. (3) Dicot root in younger stages exhibit clear cut exarch condition.
13. (3) These are protoplasmic strands for communication and transport between adjacent cells.
14. (4) Phylogeny deals with evolutionary interrelations.
15. (1) Meselson and Stahl first demonstrated the semi conservative method of replication by using N_{15} in E.Coli.
16. (2) Smooth muscle fibers line most of the internal hollow organs of the body, such as the intestines, stomach, and uterus (womb) . They help move substances through tubular areas such as blood vessels and the small intestines. Smooth muscles contract automatically, spontaneously, and often rhythmically. They are slower to contract than skeletal muscles, but they can remain contracted longer.
    Skeletal muscles act in pairs. The flexing (contracting) of one muscle is balanced by a lengthening (relaxation) of its paired muscle or a group of muscles. These antagonistic (opposite) muscles can open and close joints such as the elbow or knee. An example of antagonistic muscles are the biceps (muscles in the front of the upper arm) and the triceps (muscles in the back of the upper arm).
17. (2) The epithelial tissue present in the bronchioles and fallopian tubes is ciliated epithelium. Ciliated epithelium is present on the surfaces which involve movement of particles, mucous or cells.
18. (1) Aschelminthes are bilaterally symmetrical and triploblastic with pseudocoelom. Sponges are generally asymmetrical and some are radially symmetrical and diploblastic. Coelenterates and Ctenophores are radially symmetrical and diploblastic.
19. (2) Myometrium does not breakdown during menstruation, so there is no regeneration of myometrium in proliferative phase. Ovulation results in the formation of corpus luteum and thus progesterone will increase.
    The time frame from when the egg is released from the ovary to the time of menstruation is exactly 14 days for all women. This is the time taken by corpous luteum to produce progesterone as it waits to see if the egg is fertilized to bring new life.
20. (4) The Bt cotton variety contains a foreign gene obtained from *Bacillus thuringiensis*. This bacterial gene, introduced genetically into the cotton seeds, protects the plants from bollworm *(A. lepidoptora)*, a major pest of cotton. The worm feeding on the leaves of a BT cotton plant becomes lethargic and sleepy, thereby causing less damage to the plant.
21. (2) Peripatus is a connecting link between annelida and arthropoda. It has annelidian character like presence of nephridia and unjointed legs and like arthopods it respires by trachea.
22. (3) The male accessory glands include paired seminal vesicles, a prostate and paired bulbourethral glands; secretions of these glands constitute seminal plasma which is rich in fructose, calcium and certain enzymes.
23. (2) The various cells in a tissue are held together by ECF (extracellular fluid) , it is made up of glyco-proteins and acts as a binder. In the epithetial tissue the cells are in close contact with each other with little or no extracellular fluid. So, the cells in epithelial tissue are held together by cell junctions.

24. (3) Micturition is same as urination. Urination is the act of passing urine which is a reflex phenomenon. As urine accumulates in bladder the stretch *receptors are* activated that pass the stimulus to the spinal cord. In the absence of stretch receptors the urine will collect in the bladder to the maximum; then micturition will continue drop by drop. This results in urinary incontinence.

25. (1) Annelids are bilaterally symmetrical, triploblas-tic with a true coelom. The coelom is filled with coelomic fluid which acts as hydraulic skeleton and even helps in locomotion.

26. (3) In the ABO blood group system the blood group 'O' has no antigen on RBC but both the antibodies a and b are present in blood plasma.

27. (3) Tetanus toxoid is a vaccine consisting of growth products of Clostridium tetani treated with formaldehyde serving as an active immunising agent. Hence is weakened germs. This is an example of artificially acquired passive immunity.

28. (2) Alzheimer's diseases is due to the deficiency of acetylcholine.
This disorder is associated with loss of memory of past events. Alzheimer's disease is a brain disorder named for German physician Alois Alzheimer, who first described it in 1906. Alzheimer's destroys brain cells, causing problems with memory, thinking and behavior severe enough to affect work, lifelong hobbies or social life. Alzheimer's gets worse over time, and it is fatal.
The two most significant physical findings in the cells of brains affected by Alzheimer's disease are neuritic plaques and neurofibrillary tangles. Another significant factor in AD is the greatly reduced presence of acetylcholine in the cerebral cortex. Acetylcholine is necessary for cognitive function.
While some neuritic plaques, or patches, are commonly found in brains of elderly people, they appear in excessive numbers in the cerebral cortex of Alzheimer's disease patients. A protein called beta amyloid occupies the centre of these plaques. Surrounding the protein are fragments of deteriorating neurons, especially those that produce acetylcholine (ACh), a neurotransmitter essential for processing memory and learning. Neurotransmitters are chemicals that transport information or signals between neurons.

29. (3) Mixing of sewage decreases DO and increases BOD, due to increased aerobic digestion of organic waste.

30. (2) Gene isolate from marrow cells producing ADA if introduced into cells at early embryonic stages, could be a permanent cure.
ADA deficiency is one form of SCID (severe combined immunodeficiency), a type of disorder that affects the immune system. ADA deficiency is very rare, but very dangerous, because a malfunctioning immune system leaves the body open to infection from bacteria and viruses.
There are no real cures for ADA deficiency, but doctors have tried to restore ADA levels and improve immune system function with a variety of treatments
1. Bone marrow transplantation from a biological match (for example, a sibling) to provide healthy immune cells
2. Transfusions of red blood cells (containing high levels of ADA) from a healthy donor
3. Enzyme replacement therapy, involving repeated injections of the ADA enzyme
4. Gene therapy-to insert synthetic DNA containing a normal ADA gene into immune cells.

31. (3) Cytoskeleton is made up of microfilaments and microtubules whose major constituents are actin and tubulin respectively.
Microtubule - Tubulin protein
Microfilament - Actin protein
Intermediate filament - Acidic proteins

32. (2) Axile placentation — ovules are borne at or around the centre of a compound ovary on an axis formed from joined septa, e.g., Lemon Basal placentation - where one or few ovules develop at the base of a simple or compound ovary, e.g., Marigold
Parietal placentation — where ovules develop on the wall or slight outgrowths of the wall forming broken partitions within a compound ovary, e.g., Argemone
Free central placentation — A type of placenta structure in an ovary, in which the ovules cluster freely around a columnlike central placenta which is attached at the base of the ovary, e.g., Dianthus

33. (2) *Haplontic type* : This type is found in all chlorophyceae. In such cases the somatic phasse (plant) is haploid (Gametophyte) while the diploid phase (sporophte) is represented by zygote. During germination the zygote (2n) divides meiotically producing haploid (n) zoospores, which develop into individual plant. Here the unicellular or filamentous gametophyte (n) alternates with one-celled zygote or sporophyte (2n) . The haploid filamentous plants are known as haplonts which reproduce asexually by zoospores or aplanospores producing the individals like parents.
Diplontic type : This pattern is reverse of haplontic type. In this case somatic phase (plant) is diploid (sporophyte 2n) while the haploid phase (gametophyte) is restricted to gmetes which are produced by meiotic division. After gametic union a diploid zygote is formed, which develops into a diploid (sporophyte 2n) plant by mitotic divisions, e.g., Wheat

Diplobiontic or Haplodiplontic life cycle : This type of life cycle is found in almost all Rhodophyceae except Nemalionales. Here the life cycle is triphasic and involves an alternation of two diploid (2x) or sporophytic generations, i.e. carposporophyte and tetrasporophyte with one haploid (x) or gameto-phytic generation. Thus there are two diploid phases and one haploid phase, the gametophyte produce gametes which unite and orm a zygote (2x). Now the zygote divides mitotically forming a carposporophyte (2x) bearing diploid (2x) carpo-spores. On germination these diploid carpspores form another diploid plant, the tetrasporophyte. The latter produce tetraspores by meiosis. The haploid tetraspores erminate and give rise to hap-loid gametophytic plants, e.g., *Funaria and Polytrichum*.

34. (1) Development of two kinds of spores (heterospory) is marked as the primary requirement to develop the seed. Heterospory is the advent of seed habit.

35. (4) Tracheary elements develop as a result of maturing involving lignification and loss of protoplasm.

36. (1) Volvox -Plankton stage, Hydrilla - Submerged stage
Pistia -Floating stage, Scirpys - Reed swamp stage
Lantana -Woodland stage, Oak - Climax stage

37. (4) Dark reaction is light independent reaction and is an enzymatic process.

38. (4) *Equisetum* is a pteridophyte i.e., vascular cryptogam.

39. (1) Movement of guard cells regulate transpiration.

40. (3) Suckers are used in mint to propagate profusely.

41. (4) Fleshy testa is edible for pomegranate and cotyledons are edible in groundnut.

42. (1) The correct sequence of spermatogenetic stages leading to the formation of sperms in mature human testes is Spermatogonia → Primary spermatocyte → Secondary spermatocyte → Spermatid → Sperms.

43. (4)Mesophyll is characteristically undifferentiated in monocot leaf e.g., *Sorghum*.

44. (1) In monocots vascular bundles are closed and scattered.

45. (2) This is a phenomenon of industrial melanism. The moths rested during day time when their predators (birds) are active. During industrial revolution, the surrounding areas were covered with soot and hence dark forms got camouflaged. This offered protection to dark forms when coal was used. Later when electricity was source of energy the environment became lighter (absence of soot) and more of the paler forms of moth were sighted.

46. (4) Both marasmus and kwashiorkor are PEM (Protein-energy malnutrition) disorders. Marasmus occurs in infants below the age of one.
Marasmus is energy malnutrition due to inadquate caloric intake (not enough protein), carbohydrates, or fats are being consumed), while Kwashiorkor is protein malnutrition (only adequate protein is lacking in the diet)

47. (1) The yellow colour of the faeces in due to a pigment stercobilin. It is formed by the breakdown of bile pigments i.e., bilirubin brought to intestine through the bile juice.
Note : The yellow colour in urine is due to chemicals called urobilins. These are the breakdown products of the bile pigment bilirubin. Bilirubin is itself a breakdown product of the heme part of hemoglobin from worn-out red blood cells. Most billirubin is partly broken down in the liver, stored in the gall bladder, broken down some more in the intestines, and excreted in the feces (its metabolites are what make feces brown), but some remains in the bloodstream to be extracted by the kidneys where, converted to urobilins, it gives urine that familiar yellow tint.

48. (1) Substances like fructose and some amino acids are absorbed with the help of the carrier ions like Na^+. Their mechanism is called the facilitated diffusion.
Facilitated diffusion (facilitated transport) is a process of passive transport (diffusion) via which molecules diffuse across membranes, with the help of transport proteins (Mediated transport).

49. (3) T-lymphocytes : A class of lymphocytes, derived from the thymus gland. They originate from lymphoid stem cells that migrate from the bone marrow to the thymus and differentiate under the influence of the thymic hormones. Various sub-populations have been described. They help to control cell-mediated immunity and the control of b-cell development, to facilitate anti-body production. T lymphocytes assist in the recognition and rejection of foreign tissues and provide immune surveillance for cancer.

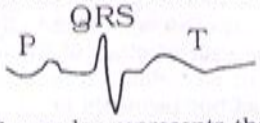
50. (4) Splicing is eukaryotic feature to remove introns (non coding sequences).

51. (2) 'Jawless' fishes belong to the class Cyclostomata. The example of this class are Petromyzon (lamprey) and Myxine (hagfish).

52. (2) Deficiency of thyoxine in adults in specifically called myxoedema characterised by low metabolic rate increase in body weight and tendency to retain water in tissues. Thyroxine is a calorigenic hormone.

53. (3) P-wave in ECG represents depolarisation of atria. QRS wave represents depolarisation of ventricles. ST wave depolerisation of ventricle. T is for repolarisation of ventricles.

Each heartbeat generates a "complex" consisting of 3 parts :
The 'P' wave represents the electrical impulse traveling across the atria of the heart. Abnormalities of the P wave, therefore, reflect abnormalities of the right and/or left atrium.



The QRS complex represents the electrical impulse as it travels across the ventricles. Abnormalities of the QRS are often seen when there has been prior damage to the ventricular muscle, such as in a prior myocardial infarction (heart attack.) The "T" wave represents the recovery period of the ventricular muscle after it has been stimulated. The portion of the ECG between the QRS complex and the T wave is called the ST segment. Abnor: malities of the ST segment and the T waves are often seen when the heart muscle is ischemic that is, when it is not getting enough oxygen, usually because there is a blockage in a coronary artery.

54. (2) Uric acid is the nitrogenous waste material excreted by cockroach. The excretory waste of frog and man is urea. Earthworm is both ammonotelic and ureotelic. Ammonia is excreted when there is plenty of water whereas urea is excreted, when water is scarce.

55. (4) One of the reasons why we worry about DDT is because it doesn't break down in the environment or in organisms. DDT's long life is due to its low solubility in water and it's relatively high solubility in fats. Solubility is the ability for one substance to completely dissolve in another. DDT is water insoluble and lipid (fat) soluble. This means that DDT will not dissolve in water, but it will in the fats of organisms. This means that once an animals ingests a little DDT, it will mix in with its fat. And as we all know, all organisms (including human beings) have a certain amount of residual fat in their bodies. Once DDT get in there, it tends to stay.

56. (3) Baldness is a sex influenced trait.

57. (2) If menstruation is not taking place in regularly cycling human female, it indicates the maintenance of high concentration of sex hormones in the blood steam.

58. (4) Antibodies are gamma globulins synthesised by lymph nodes.

59. (1) The Pelvic Girdle, also called the hip girdle, is composed to two coxal (hip) bones. The coxal bones are also called the ossa coxae or innominate bones. During childhood, each coxal bone consists of three separate parts; the ilium, the ischium and the pubis. In an adult, these three bones are firmly fused into a single bone.

60. (4) Triplet code was first deciphered by Nirenberg and Matthaei using homopolymer of 'Poly U' nucleotides.

61. (2) pseudoallelism

62. (1) epistasis

63. (3) $ccP_p \times CC_{pp}$

64. (2)

A	B	C	D
3	1	4	2

65. (4) Both (1) and (3)

66. (2) pleiotropy

67. (4) Cytoplasmic and genetic with restorers

68. (4) seed production

69. (4) All of the above

70. (4) (1) and (2) are correct

71. (2)

A	B	C	D
4	2	1	3

72. (1) Mediterranean origin

73. (3) general combining ability

74. (4) double topcross hybrid

75. (4) Co — 8152

76. (3) F_2

77. (3) dioecious plant

78. (1)

A	B	C	D
4	3	2	1

79. (4) Both (1) and (3)

80. (4) Cultivar is triploid in genetic constitution.

81. (3) Dichogamy

82. (4) Both (1) and (3)

83. (1)

A	B	C	D
1	2	4	3

84. (4) Both (1) and (3)

85. (4) Market garden

86. (1)

A	B	C	D
4	2	1	3

87. (1)

2	3	4	1

88. (2)

2	4	1	3

89. (1) Cooking the fruit

90. (3)

A	B	C	D
2	4	3	1

91. (4) Both (1) and (2)

92. (3)

A	B	C	D
4	1	2	3

93. (3) Potato – Black ward

94. (1) Karnal bunt of wheat – *Neovossia horrida*

95. (1) RNA only

96. (4) internally seed-borne disease

97. (4) All of the above

98. (4) Parasite, Mass rearing, Release, Parasitism

99. (2) tetracycline

100. (1) spotted bollworm

101. (3)

A	B	C	D
4	3	1	2

102. (4) Monocrotophos

103. (4) burying in the soil

104. (4) Both (2) and (3)

105. (4) All of the above
106. (4) 500 ppm
107. (3) update the technical knowledge and skills of agricultural extension workers.
108. (3) Marginal cost — Additional cost to produce an additional unit of output.
109. (1) Elasticity of greater than unity — Stage II of classical production function
110. (4) All of the above
111. (2) Rs. 24,200
112. (4) Both (1) and (3)
113. (4) should adopt
114. (1) at least 10%

	A	B	C	D
115. (3)	3	1	2	4
116. (2)	2	3	4	1
117. (4)	1	3	4	2

118. (2) system of growing different crops in succession on the same land
119. (3) pineapple

	A	B	C	D
120. (1)	3	1	4	2

121. (3) CRI and flowering stages
122. (2) quality seed tuber

	A	B	C	D
123. (3)	4	3	2	1

124. (1) atrazine
125. (4) Multiple cropping system
126. (4) O_2 > Si > Al >Fe
127. (4) Loamy soils with medium aeration and medium water holding capacity
128. (2) 1, 2, 4, 3
129. (3) 2, 1, 4, 3
130. (3) conversion of soluble phosphorus into plant unavailable forms
131. (3) Water inundated soils — High nitrogen mineralisation
132. (1) barely > wheat > upland paddy > beans
133. (2) non-capillary porosity
134. (2) C : N ratio is below 20 : 1
135. (4) Both (1) and (2)
136. (1) 25.0%

	A	B	C	D
137. (3)	3	4	1	2

138. (2) finely ground rock phosphate
139. (3) 8 - 8 - 0
140. (2) controlled release nitrogenous fertilizers
141. (4) All of the above are correct
142. (4) Potassium

	A	B	C	D
143. (4)	1	2	4	3

144. (1) Zn and Mn
145. (4) two molecules of ATP are consumed and four molecules of ATP are generated
146. (4) 3, 4, 1, 2

	A	B	C	D
147. (3)	4	3	2	1

148. (4) Both (1) and (3)
149. (1) antiauxin
150. (1) Expressed in males
151. (1) Lytic
152. (2) Guanine rich repeats
153. (3) Mitochondria and chloroplasts
154. (1) UAUGC
155. (2) Are synthesized by bacteria as part of their defense mechanism
156. (3) DNA is not present at any stage in the life cycle of retroviruses
157. (4) Non-sister chromatids of a bivalent
158. (4) 50% will be tall with red fruit
159. (1) *Agrobacterium*
160. (2) Leaves modified to spines
161. (2) Moves in bi-directional way
162. (3) Protein structure
163. (4) None of the progenies
164. (1) AB
165. (2) *Anabaena*
166. (4) Methane
167. (4) *Serratia* — Drug addiction
168. (2) *Anopheles culifacies* – Leishmaniasis
169. (4) Disappear
170. (4) 50% colour-blind
171. (2) Reporter
172. (3) Hernitropous
173. (2) A symbiotic relationship with the alga
174. (3) Power of adaptability in diverse habitat
175. (3) Tetraploidy
176. (3) Epinephrine
177. (1) Na^+ into the cell
178. (4) Conserve water
179. (4) Undergoing rapid division
180. (3) High fertility, low or rapidly falling mortality rate, rapid population growth and a very young age distribution
181. (3) Luteinizing hormone – Failure of ovulation
182. (4) Secretin, cholecystokinin
183. (1) Birds, reptiles and insects
184. (4) Heparin and histamine
185. (1) Myosin
186. (4) Vitamin B_6 – Loss of appetite
187. (2) Faster and deeper
188. (4) Proteins, steroids and biogenic amines
189. (4) Presence of diaphragm
190. (4) Oxygen
191. (3) Test tube containing calcium bicarbonate
192. (2) Carbon monoxide
193. (2) Atrioventricular node
194. (4) Prolactin
195. (3) Tongue movements
196. (2) At the end of the proliferative phase
197. (1) Alkaline phosphatase is the key reagent
198. (3) Decondensation from chromosomes and reassembly of the nuclear lamina
199. (1) 4 - 6 µg/100 ml
200. (2) Tyrosinase