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NEET (UG) 2018 — Biology (Botany + Zoology)

Exam date: 6 May 2018 • Test Booklet Code: ZZ • Questions 46–135 (90 questions, all compulsory) • +4 / –1

Questions as they appeared in NEET (UG) 2018 conducted by CBSE. Answers verified by competitorspoint.com. Explanations by competitorspoint.com.

Biology — Botany + Zoology (Q. 46–135, all compulsory; Zoology Q46–90, Botany Q91–135 as in the original paper)

46. The difference between spermiogenesis and spermiation is

(1) In spermiogenesis spermatids are formed, while in spermiation spermatozoa are formed.

(2) In spermiogenesis spermatozoa are formed, while in spermiation spermatids are formed.

(3) In spermiogenesis spermatozoa are formed, while in spermiation spermatozoa are released from sertoli cells into the cavity of seminiferous tubules.

(4) In spermiogenesis spermatozoa from sertoli cells are released into the cavity of seminiferous tubules, while in spermiation spermatozoa are formed.

47. The amnion of mammalian embryo is derived from

(1) ectoderm and mesoderm
(2) endoderm and mesoderm
(3) ectoderm and endoderm
(4) mesoderm and trophoblast

48. The contraceptive 'SAHELI'

(1) blocks estrogen receptors in the uterus, preventing eggs from getting implanted.

(2) increases the concentration of estrogen and prevents ovulation in females.

(3) is a post-coital contraceptive.

(4) is an IUD.

49. Hormones secreted by the placenta to maintain pregnancy are

(1) hCG, hPL, progestogens, prolactin
(2) hCG, hPL, estrogens, relaxin, oxytocin
(3) hCG, progestogens, estrogens, glucocorticoids
(4) hCG, hPL, progestogens, estrogens

50. Match the items given in Column I with those in Column II and select the correct option given below :

Column I		Column II	
(a)	Proliferative Phase	**(i)**	Breakdown of endometrial lining
(b)	Secretory Phase	**(ii)**	Follicular Phase
(c)	Menstruation	**(iii)**	Luteal Phase

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

51. All of the following are part of an operon except

(1) an operator
(2) structural genes
(3) a promoter
(4) an enhancer

52. A woman has an X-linked condition on one of her X chromosomes. This chromosome can be inherited by

(1) Only daughters
(2) Only sons
(3) Both sons and daughters
(4) Only grandchildren

53. According to Hugo de Vries, the mechanism of evolution is

(1) Multiple step mutations
(2) Saltation
(3) Minor mutations
(4) Phenotypic variations

54. AGGTATCGCAT is a sequence from the coding strand of a gene. What will be the corresponding sequence of the transcribed mRNA?

(1) AGGUAUCGCAU
(2) UGGTUTCGCAT
(3) UCCAUAGCGUA
(4) ACCUAUGCGAU

55. Among the following sets of examples for divergent evolution, select the incorrect option :

(1) Forelimbs of man, bat and cheetah
(2) Heart of bat, man and cheetah
(3) Eye of octopus, bat and man
(4) Brain of bat, man and cheetah

56. Conversion of milk to curd improves its nutritional value by increasing the amount of

(1) Vitamin D **(2)** Vitamin A
(3) Vitamin E **(4)** Vitamin B_{12}

57. Which of the following is not an autoimmune disease?

(1) Psoriasis **(2)** Rheumatoid arthritis
(3) Vitiligo **(4)** Alzheimer's disease

58. The similarity of bone structure in the forelimbs of many vertebrates is an example of

(1) Homology **(2)** Analogy
(3) Adaptive radiation **(4)** Convergent evolution

59. Which of the following characteristics represent 'Inheritance of blood groups' in humans?

a.. Dominance
b.. Co-dominance
c.. Multiple allele
d.. Incomplete dominance
e.. Polygenic inheritance

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

60. In which disease does mosquito transmitted pathogen cause chronic inflammation of lymphatic vessels?

(1) Elephantiasis **(2)** Ascariasis
(3) Amoebiasis **(4)** Ringworm disease

61. All of the following are included in 'ex-situ conservation' except

(1) Wildlife safari parks **(2)** Sacred groves
(3) Seed banks **(4)** Botanical gardens

62. Which part of poppy plant is used to obtain the drug "Smack"?

(1) Flowers **(2)** Latex
(3) Leaves **(4)** Roots

63. In a growing population of a country,

(1) pre-reproductive individuals are more than the reproductive individuals.
(2) reproductive individuals are less than the post-reproductive individuals.
(3) pre-reproductive individuals are less than the reproductive individuals.
(4) reproductive and pre-reproductive individuals are equal in number.

64. Which one of the following population interactions is widely used in medical science for the production of antibiotics?

(1) Commensalism **(2)** Mutualism
(3) Amensalism **(4)** Parasitism

65. Match the items given in Column I with those in Column II and select the correct option given below :

Column I		Column II	
(a)	Eutrophication	**(i)**	UV-B radiation
(b)	Sanitary landfill	**(ii)**	Deforestation
(c)	Snow blindness	**(iii)**	Nutrient enrichment
(d)	Jhum cultivation	**(iv)**	Waste disposal

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

66. Which of the following options correctly represents the lung conditions in asthma and emphysema, respectively?

(1) Inflammation of bronchioles; Decreased respiratory surface
(2) Increased number of bronchioles; Increased respiratory surface
(3) Decreased respiratory surface; Inflammation of bronchioles
(4) Increased respiratory surface; Inflammation of bronchioles

67. Match the items given in Column I with those in Column II and select the correct option given below :

Column I		Column II	
(a)	Tricuspid valve	**(i)**	Between left atrium and left ventricle
(b)	Bicuspid valve	**(ii)**	Between right ventricle and pulmonary artery
(c)	Semilunar valve	**(iii)**	Between right atrium and right ventricle

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

68. Match the items given in Column I with those in Column II and select the correct option given below :

Column I		Column II	
(a)	Tidal volume	**(i)**	2500 – 3000 mL
(b)	Inspiratory Reserve volume	**(ii)**	1100 – 1200 mL
(c)	Expiratory Reserve volume	**(iii)**	500 – 550 mL
(d)	Residual volume	**(iv)**	1000 – 1100 mL

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

69. Which of the following is an amino acid derived hormone?

(1) Epinephrine **(2)** Ecdysone
(3) Estriol **(4)** Estradiol

70. Which of the following structures or regions is incorrectly paired with its functions?

(1) Medulla oblongata : controls respiration and cardiovascular reflexes.
(2) Limbic system : consists of fibre tracts that interconnect different regions of brain; controls movement.
(3) Corpus callosum : band of fibers connecting left and right cerebral hemispheres.
(4) Hypothalamus : production of releasing hormones and regulation of temperature, hunger and thirst.

71. The transparent lens in the human eye is held in its place by

(1) ligaments attached to the ciliary body
(2) ligaments attached to the iris
(3) smooth muscles attached to the ciliary body
(4) smooth muscles attached to the iris

72. Which of the following hormones can play a significant role in osteoporosis?

(1) Aldosterone and Prolactin
(2) Progesterone and Aldosterone
(3) Parathyroid hormone and Prolactin
(4) Estrogen and Parathyroid hormone

73. Which of the following gastric cells indirectly help in erythropoiesis?

(1) Chief cells **(2)** Mucous cells
(3) Parietal cells **(4)** Goblet cells

74. Match the items given in Column I with those in Column II and select the correct option given below :

Column I		Column II	
(a)	Fibrinogen	**(i)**	Osmotic balance
(b)	Globulin	**(ii)**	Blood clotting
(c)	Albumin	**(iii)**	Defence mechanism

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

75. Which of the following is an occupational respiratory disorder?

(1) Anthracis **(2)** Silicosis
(3) Emphysema **(4)** Botulism

76. Calcium is important in skeletal muscle contraction because it

(1) Binds to troponin to remove the masking of active sites on actin for myosin.
(2) Activates the myosin ATPase by binding to it.
(3) Prevents the formation of bonds between the myosin cross bridges and the actin filament.
(4) Detaches the myosin head from the actin filament.

77. Select the incorrect match :

(1) Lampbrush chromosomes – Diplotene bivalents
(2) Allosomes – Sex chromosomes
(3) Polytene chromosomes – Oocytes of amphibians
(4) Submetacentric chromosomes – L-shaped chromosomes

78. Nissl bodies are mainly composed of

(1) Proteins and lipids **(2)** DNA and RNA
(3) Free ribosomes and RER **(4)** Nucleic acids and SER

79. Which of these statements is incorrect?

(1) Enzymes of TCA cycle are present in mitochondrial matrix
(2) Glycolysis occurs in cytosol
(3) Oxidative phosphorylation takes place in outer mitochondrial membrane
(4) Glycolysis operates as long as it is supplied with NAD^+ that can pick up hydrogen atoms

80. Which of the following events does not occur in rough endoplasmic reticulum?

(1) Protein folding **(2)** Protein glycosylation
(3) Phospholipid synthesis **(4)** Cleavage of signal peptide

81. Many ribosomes may associate with a single mRNA to form multiple copies of a polypeptide simultaneously. Such strings of ribosomes are termed as

(1) Polysome **(2)** Polyhedral bodies
(3) Nucleosome **(4)** Plastidome

82. Which of the following terms describe human dentition?

(1) Thecodont, Diphyodont, Homodont
(2) Thecodont, Diphyodont, Heterodont
(3) Pleurodont, Diphyodont, Heterodont
(4) Pleurodont, Monophyodont, Homodont

83. Identify the vertebrate group of animals characterized by crop and gizzard in its digestive system

(1) Amphibia **(2)** Reptilia
(3) Osteichthyes **(4)** Aves

84. Which one of these animals is not a homeotherm?

(1) Macropus **(2)** Chelone
(3) Psittacula **(4)** Camelus

85. Which of the following features is used to identify a male cockroach from a female cockroach?

(1) Presence of a boat shaped sternum on the 9th abdominal segment
(2) Presence of caudal styles
(3) Presence of anal cerci
(4) Forewings with darker tegmina

86. Which of the following organisms are known as chief producers in the oceans?

(1) Dinoflagellates **(2)** Diatoms
(3) Euglenoids **(4)** Cyanobacteria

87. Ciliates differ from all other protozoans in

(1) using flagella for locomotion
(2) having a contractile vacuole for removing excess water
(3) having two types of nuclei
(4) using pseudopodia for capturing prey

88. Which of the following animals does not undergo metamorphosis?

(1) Earthworm **(2)** Tunicate
(3) Starfish **(4)** Moth

89. Match the items given in Column I with those in Column II and select the correct option given below :

Column I (Function)		Column II (Part of Excretory system)	
(a)	Ultrafiltration	**(i)**	Henle's loop
(b)	Concentration of urine	**(ii)**	Ureter
(c)	Transport of urine	**(iii)**	Urinary bladder
(d)	Storage of urine	**(iv)**	Malpighian corpuscle
		(v)	Proximal convoluted tubule

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

90. Match the items given in Column I with those in Column II and select the correct option given below :

Column I		Column II	
(a)	Glycosuria	**(i)**	Accumulation of uric acid in joints
(b)	Gout	**(ii)**	Mass of crystallised salts within the kidney
(c)	Renal calculi	**(iii)**	Inflammation in glomeruli
(d)	Glomerular nephritis	**(iv)**	Presence of glucose in urine

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

91. What is the role of NAD^+ in cellular respiration?

(1) It functions as an enzyme.
(2) It functions as an electron carrier.
(3) It is the final electron acceptor for anaerobic respiration.
(4) It is a nucleotide source for ATP synthesis.

92. Which one of the following plants shows a very close relationship with a species of moth, where none of the two can complete its life cycle without the other?

(1) Hydrilla **(2)** Yucca
(3) Viola **(4)** Banana

93. Oxygen is not produced during photosynthesis by

(1) Green sulphur bacteria **(2)** Nostoc
(3) Chara **(4)** Cycas

94. In which of the following forms is iron absorbed by plants?

(1) Ferric **(2)** Ferrous
(3) Both ferric and ferrous **(4)** Free element

95. Double fertilization is

(1) Fusion of two male gametes of a pollen tube with two different eggs
(2) Fusion of one male gamete with two polar nuclei
(3) Syngamy and triple fusion
(4) Fusion of two male gametes with one egg

96. Which of the following elements is responsible for maintaining turgor in cells?

(1) Magnesium **(2)** Sodium
(3) Calcium **(4)** Potassium

97. Pollen grains can be stored for several years in liquid nitrogen having a temperature of

(1) –120°C **(2)** –80°C
(3) –160°C **(4)** –196°C

98. Which among the following is not a prokaryote?
(1) Saccharomyces **(2)** Mycobacterium
(3) Oscillatoria **(4)** Nostoc

99. The two functional groups characteristic of sugars are
(1) Hydroxyl and methyl **(2)** Carbonyl and methyl
(3) Carbonyl and hydroxyl **(4)** Carbonyl and phosphate

100. Which of the following is not a product of light reaction of photosynthesis?
(1) ATP **(2)** NADH
(3) Oxygen **(4)** NADPH

101. Stomatal movement is not affected by
(1) Temperature **(2)** Light
(3) CO_2 concentration **(4)** O_2 concentration

102. The Golgi complex participates in
(1) Fatty acid breakdown
(2) Formation of secretory vesicles
(3) Activation of amino acid
(4) Respiration in bacteria

103. Which of the following is true for nucleolus?
(1) Larger nucleoli are present in dividing cells
(2) It is a membrane-bound structure
(3) It is a site for active ribosomal RNA synthesis
(4) It takes part in spindle formation

104. Stomata in grass leaf are
(1) Dumb-bell shaped **(2)** Kidney shaped
(3) Barrel shaped **(4)** Rectangular

105. The stage during which separation of the paired homologous chromosomes begins is
(1) Pachytene **(2)** Diplotene
(3) Zygotene **(4)** Diakinesis

106. Which of the following is commonly used as a vector for introducing a DNA fragment in human lymphocytes?
(1) Retrovirus **(2)** Ti plasmid
(3) pBR322 **(4)** λ phage

107. Use of bioresources by multinational companies and organisations without authorisation from the concerned country and its people is called
(1) Bio-infringement **(2)** Biopiracy
(3) Bioexploitation **(4)** Biodegradation

108. In India, the organisation responsible for assessing the safety of introducing genetically modified organisms for public use is
(1) Indian Council of Medical Research (ICMR)
(2) Council for Scientific and Industrial Research (CSIR)
(3) Genetic Engineering Appraisal Committee (GEAC)
(4) Research Committee on Genetic Manipulation (RCGM)

109. The correct order of steps in Polymerase Chain Reaction (PCR) is
(1) Extension, Denaturation, Annealing
(2) Annealing, Extension, Denaturation
(3) Denaturation, Annealing, Extension
(4) Denaturation, Extension, Annealing

110. Select the correct match
(1) Ribozyme - Nucleic acid
(2) F_2 × Recessive parent – Dihybrid cross
(3) G. Mendel - Transformation
(4) T.H. Morgan - Transduction

111. A 'new' variety of rice was patented by a foreign company, though such varieties have been present in India for a long time. This is related to
(1) Co-667 **(2)** Sharbati Sonora
(3) Basmati **(4)** Lerma Rojo

112. Select the correct match
(1) Alec Jeffreys – Streptococcus pneumoniae
(2) Alfred Hershey and Martha Chase – TMV
(3) Francois Jacob and Jacques Monod – Lac operon
(4) Matthew Meselson and F. Stahl – Pisum sativum

113. Which of the following has proved helpful in preserving pollen as fossils?
(1) Pollenkitt **(2)** Cellulosic intine
(3) Sporopollenin **(4)** Oil content

114. The experimental proof for semiconservative replication of DNA was first shown in a
(1) Fungus **(2)** Bacterium
(3) Virus **(4)** Plant

115. Which of the following pairs is wrongly matched?
(1) Starch synthesis in pea : Multiple alleles
(2) ABO blood grouping : Co-dominance
(3) T.H. Morgan : Linkage
(4) XO type sex determination : Grasshopper

116. Offsets are produced by
(1) Meiotic divisions **(2)** Mitotic divisions
(3) Parthenogenesis **(4)** Parthenocarpy

117. Select the correct statement

(1) Franklin Stahl coined the term ''linkage''
(2) Punnett square was developed by a British scientist
(3) Transduction was discovered by S. Altman
(4) Spliceosomes take part in translation

118. Which of the following flowers only once in its life-time?

(1) Bamboo species **(2)** Jackfruit
(3) Papaya **(4)** Mango

119. Niche is

(1) all the biological factors in the organism's environment
(2) the physical space where an organism lives
(3) the functional role played by the organism where it lives
(4) the range of temperature that the organism needs to live

120. In stratosphere, which of the following elements acts as a catalyst in degradation of ozone and release of molecular oxygen?

(1) Carbon **(2)** Cl
(3) Oxygen **(4)** Fe

121. What type of ecological pyramid would be obtained with the following data?
Secondary consumer : 120 g
Primary consumer : 60 g
Primary producer : 10 g

(1) Inverted pyramid of biomass **(2)** Pyramid of energy
(3) Upright pyramid of biomass **(4)** Upright pyramid of numbers

122. Which of the following is a secondary pollutant?

(1) CO **(2)** CO_2
(3) O_3 **(4)** SO_2

123. World Ozone Day is celebrated on

(1) 5th June **(2)** 21st April
(3) 22nd April **(4)** 16th September

124. Natality refers to

(1) Death rate
(2) Birth rate
(3) Number of individuals entering a habitat
(4) Number of individuals leaving the habitat

125. Match the items given in Column I with those in Column II and select the correct option given below :

Column I		Column II	
(a)	Herbarium	**(i)**	It is a place having a collection of preserved plants and animals
(b)	Key	**(ii)**	A list that enumerates methodically all the species found in an area with brief description aiding identification
(c)	Museum	**(iii)**	Is a place where dried and pressed plant specimens mounted on sheets are kept
(d)	Catalogue	**(iv)**	A booklet containing a list of characters and their alternates which are helpful in identification of various taxa.

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

126. Which one is wrongly matched?

(1) Uniflagellate gametes – Polysiphonia
(2) Biflagellate zoospores – Brown algae
(3) Unicellular organism – Chlorella
(4) Gemma cups – Marchantia

127. After karyogamy followed by meiosis, spores are produced exogenously in

(1) Neurospora **(2)** Alternaria
(3) Saccharomyces **(4)** Agaricus

128. Winged pollen grains are present in

(1) Mustard **(2)** Cycas
(3) Pinus **(4)** Mango

129. Pneumatophores occur in

(1) Halophytes **(2)** Free-floating hydrophytes
(3) Submerged hydrophytes **(4)** Carnivorous plants

130. Plants having little or no secondary growth are

(1) Grasses **(2)** Deciduous angiosperms
(3) Cycads **(4)** Conifers

131. Casparian strips occur in

(1) Epidermis **(2)** Pericycle
(3) Endodermis **(4)** Cortex

132. Secondary xylem and phloem in dicot stem are produced by

(1) Apical meristems **(2)** Vascular cambium
(3) Axillary meristems **(4)** Phellogen

133. Select the wrong statement :

(1) Cell wall is present in members of Fungi and Plantae
(2) Mushrooms belong to Basidiomycetes
(3) Mitochondria are the powerhouse of the cell in all kingdoms except Monera
(4) Pseudopodia are locomotory and feeding structures in Sporozoans

134. Which of the following statements is correct?

(1) Ovules are not enclosed by ovary wall in gymnosperms
(2) Selaginella is heterosporous, while Salvinia is homosporous
(3) Stems are usually unbranched in both Cycas and Cedrus
(4) Horsetails are gymnosperms

135. Sweet potato is a modified

(1) Stem **(2)** Adventitious root
(3) Rhizome **(4)** Tap root

Answer key & explanations

Questions as they appeared in NEET (UG) 2018 conducted by CBSE. Answers verified by competitorspoint.com. Explanations by competitorspoint.com. Answer key: CBSE published the 2018 answer key only through candidate login, so no public official key for code ZZ could be found; answers are the printed answers, independently checked against NCERT by competitorspoint.com. No questions in Q46–135 were dropped or awarded as bonus.

46 – 3	**47** – 1	**48** – 1	**49** – 4	**50** – 4	**51** – 4	**52** – 3	**53** – 2	**54** – 1	**55** – 3
56 – 4	**57** – 4	**58** – 1	**59** – 2	**60** – 1	**61** – 2	**62** – 2	**63** – 1	**64** – 3	**65** – 4
66 – 1	**67** – 1	**68** – 2	**69** – 1	**70** – 2	**71** – 1	**72** – 4	**73** – 3	**74** – 3	**75** – 2
76 – 1	**77** – 3	**78** – 3	**79** – 3	**80** – 3	**81** – 1	**82** – 2	**83** – 4	**84** – 2	**85** – 2
86 – 2	**87** – 3	**88** – 1	**89** – 2	**90** – 3	**91** – 2	**92** – 2	**93** – 1	**94** – 1	**95** – 3
96 – 4	**97** – 4	**98** – 1	**99** – 3	**100** – 2	**101** – 4	**102** – 2	**103** – 3	**104** – 1	**105** – 2
106 – 1	**107** – 2	**108** – 3	**109** – 3	**110** – 1	**111** – 3	**112** – 3	**113** – 3	**114** – 2	**115** – 1
116 – 2	**117** – 2	**118** – 1	**119** – 3	**120** – 2	**121** – 1	**122** – 3	**123** – 4	**124** – 2	**125** – 3
126 – 1	**127** – 4	**128** – 3	**129** – 1	**130** – 1	**131** – 3	**132** – 2	**133** – 4	**134** – 1	**135** – 2

46. Ans (3) Spermiogenesis transforms spermatids into spermatozoa; spermiation releases the sperms from Sertoli cells into the lumen of the seminiferous tubules.

47. Ans (1) The amnion forms from ectoderm with an outer layer of mesoderm (somatopleure).

48. Ans (1) Saheli (centchroman) is a once-a-week, non-steroidal pill thought to act on uterine estrogen receptors, preventing implantation.

49. Ans (4) The placenta secretes hCG, hPL, estrogens and progestogens.

50. Ans (4) The proliferative phase is the follicular phase, the secretory phase is the luteal phase, and menstruation is the breakdown of the endometrial lining.

51. Ans (4) An operon has a promoter, an operator and structural genes; enhancers are eukaryotic regulatory elements.

52. Ans (3) A mother passes an X chromosome to both sons and daughters.

53. Ans (2) De Vries proposed that single-step large mutations (saltation) cause speciation.

54. Ans (1) mRNA has the same sequence as the coding strand, with U in place of T: AGGUAUCGCAU.

55. Ans (3) Eyes of octopus and mammals are analogous (convergent evolution), not divergent.

56. Ans (4) Lactobacillus in curd increases vitamin B_{12}.

57. Ans (4) Alzheimer's disease is a neurodegenerative disorder, not an autoimmune one.

58. Ans (1) Forelimbs of vertebrates share a common bone plan: homology.

59. Ans (2) ABO blood groups show dominance (I^A, I^B over i), co-dominance (I^AI^B) and multiple alleles.

60. Ans (1) Wuchereria, transmitted by Culex mosquitoes, causes chronic lymphatic inflammation (elephantiasis/filariasis).

61. Ans (2) Sacred groves are in situ conservation.

62. Ans (2) Smack (heroin) comes from morphine extracted from the latex of the poppy, Papaver somniferum.

63. Ans (1) A growing population has a broad-based age pyramid, with more pre-reproductive than reproductive individuals.

64. Ans (3) Antibiotic production exploits amensalism (one species is inhibited, the other unaffected).

65. Ans (4) Eutrophication – nutrient enrichment; sanitary landfill – waste disposal; snow blindness – UV-B; jhum cultivation – deforestation.

66. Ans (1) Asthma is inflammation of the bronchi and bronchioles; emphysema reduces respiratory surface as alveolar walls are damaged.

67. Ans (1) Tricuspid – between right atrium and right ventricle; bicuspid – between left atrium and left ventricle; semilunar – between ventricle and artery.

68. Ans (2) TV 500–550 mL; IRV 2500–3000 mL; ERV 1000–1100 mL; RV 1100–1200 mL.

69. Ans (1) Epinephrine is derived from the amino acid tyrosine.

70. Ans (2) The limbic system controls emotions and motivation; it does not mainly connect brain regions or control movement.

71. Ans (1) The lens is held by suspensory ligaments attached to the ciliary body.

72. Ans (4) Low estrogen and excess PTH lead to bone resorption (osteoporosis).

73. Ans (3) Parietal (oxyntic) cells secrete intrinsic factor needed for vitamin B_{12} absorption, which is needed for erythropoiesis.

74. Ans (3) Fibrinogen – clotting; globulins – defence; albumin – osmotic balance.

75. Ans (2) Silicosis is an occupational lung disease (stone grinding, mining).

76. Ans (1) Ca^{2+} binds troponin, unmasking the myosin-binding sites on actin.

77. Ans (3) Polytene chromosomes are found in insect salivary glands; lampbrush chromosomes occur in amphibian oocytes.

78. Ans (3) Nissl granules are free ribosomes and RER.

79. **Ans (3)** Oxidative phosphorylation occurs on the inner mitochondrial membrane.

80. **Ans (3)** Phospholipids (lipids) are synthesized in the SER.

81. **Ans (1)** A string of ribosomes on one mRNA is a polysome (polyribosome).

82. **Ans (2)** Human teeth are thecodont, diphyodont and heterodont.

83. **Ans (4)** Birds (Aves) have a crop and a gizzard.

84. **Ans (2)** Chelone (turtle) is a reptile, so it is poikilothermic.

85. **Ans (2)** Anal styles are present only in males.

86. **Ans (2)** Diatoms are the chief producers in the oceans.

87. **Ans (3)** Ciliates have a macronucleus and a micronucleus.

88. **Ans (1)** Earthworms show direct development without metamorphosis.

89. **Ans (2)** Ultrafiltration – Malpighian corpuscle; concentration – Henle's loop; transport – ureter; storage – urinary bladder.

90. **Ans (3)** Glycosuria – glucose in urine; gout – uric acid in joints; renal calculi – crystallised salts; glomerulonephritis – inflamed glomeruli.

91. **Ans (2)** NAD^+ acts as an electron (hydrogen) carrier.

92. **Ans (2)** Yucca and the Pronuba moth show obligate mutualism.

93. **Ans (1)** Green sulphur bacteria perform anoxygenic photosynthesis (H_2S as donor).

94. **Ans (1)** Per NCERT, plants obtain iron as ferric ions (Fe^{3+}).

95. **Ans (3)** Double fertilization = syngamy + triple fusion.

96. **Ans (4)** K^+ maintains turgor in cells (and regulates stomatal opening).

97. **Ans (4)** Pollen is cryopreserved in liquid nitrogen at –196°C.

98. **Ans (1)** Saccharomyces (yeast) is a eukaryotic fungus.

99. **Ans (3)** Sugars have carbonyl (aldehyde/ketone) and hydroxyl groups.

100. **Ans (2)** Light reactions yield ATP, NADPH and O_2; NADH is not a product.

101. **Ans (4)** Stomatal movement depends on light, temperature and CO_2, not on O_2 concentration.

102. **Ans (2)** The Golgi apparatus packages materials into secretory vesicles.

103. **Ans (3)** The nucleolus is a non-membranous site of active rRNA synthesis.

104. **Ans (1)** Grass guard cells are dumb-bell shaped.

105. **Ans (2)** Homologous chromosomes begin to separate in diplotene (chiasmata appear).

106. **Ans (1)** Retroviruses are used to introduce genes into human lymphocytes (e.g., ADA gene therapy).

107. **Ans (2)** Unauthorised use of bioresources is biopiracy.

108. **Ans (3)** GEAC assesses the safety of GM organisms for public use.

109. **Ans (3)** PCR: denaturation → annealing → extension.

110. **Ans (1)** Ribozymes are catalytic RNA (nucleic acid).

111. **Ans (3)** The patent on Basmati rice (by a US company) was a case of biopiracy.

112. **Ans (3)** Jacob and Monod proposed the lac operon.

113. **Ans (3)** Sporopollenin in the exine resists degradation, preserving pollen as fossils.

114. **Ans (2)** Meselson and Stahl proved semiconservative replication in E. coli (a bacterium).

115. **Ans (1)** Starch synthesis in pea (seed shape) shows incomplete dominance at the starch-grain level, not multiple alleles.

116. **Ans (2)** Offsets are vegetative propagules formed by mitosis.

117. **Ans (2)** Reginald Punnett, who developed the Punnett square, was a British geneticist.

118. **Ans (1)** Bamboo is monocarpic, flowering once in its lifetime.

119. **Ans (3)** A niche is the functional role of an organism in its habitat.

120. **Ans (2)** Chlorine atoms from CFCs catalyze the breakdown of ozone.

121. **Ans (1)** Biomass increases at higher trophic levels here, giving an inverted pyramid of biomass.

122. **Ans (3)** Ozone at ground level is a secondary pollutant formed photochemically.

123. **Ans (4)** World Ozone Day is 16 September.

124. **Ans (2)** Natality is the birth rate.

125. **Ans (3)** Herbarium – dried pressed specimens; key – list of contrasting characters; museum – preserved plants and animals; catalogue – list of species.

126. **Ans (1)** Polysiphonia (red alga) has non-flagellate gametes.

127. **Ans (4)** Agaricus (basidiomycete) bears basidiospores exogenously after karyogamy and meiosis.

128. **Ans (3)** Pinus pollen grains are winged.

129. **Ans (1)** Pneumatophores occur in mangroves (halophytes) such as Rhizophora.

130. **Ans (1)** Monocots such as grasses lack a vascular cambium, so they show little or no secondary growth.

131. **Ans (3)** Casparian strips are suberin bands on endodermal walls.

132. **Ans (2)** The vascular cambium produces secondary xylem and phloem.

133. **Ans (4)** Sporozoans lack locomotory organelles; pseudopodia occur in amoeboid protozoans.

134. **Ans (1)** Gymnosperms have naked ovules; Salvinia is heterosporous, Cedrus is branched, and horsetails are pteridophytes.

135. **Ans (2)** Sweet potato is a modified adventitious root.