

NEET 2018 — Biology Question Paper with Solutions

86 Biology questions as set in the paper · answers checked by RankUp

NEET 2018 · Q91

1. Oxygen is not produced during photosynthesis by

- (A) Cycas
- (B) Nostoc
- (C) Green sulphur bacteria
- (D) Chara

NEET 2018 · Q92

2. Double fertilization is

- (A) Fusion of two male gametes with one egg
- (B) Fusion of one male gamete with two polar nuclei
- (C) Fusion of two male gametes of a pollen tube with two different eggs
- (D) Syngamy and triple fusion

NEET 2018 · Q93

3. 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?

- (A) Banana
- (B) Yucca
- (C) Hydrilla
- (D) Viola

NEET 2018 · Q94

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

- (A) -196°C
- (B) -80°C
- (C) -120°C
- (D) -160°C

NEET 2018 · Q95

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

- (A) Potassium
- (B) Sodium
- (C) Magnesium
- (D) Calcium

NEET 2018 · Q96

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

- (A) It is a nucleotide source for ATP synthesis.
- (B) It functions as an electron carrier.
- (C) It functions as an enzyme.
- (D) It is the final electron acceptor for anaerobic respiration.

NEET 2018 · Q98

7. Which of the following is commonly used as a vector for introducing a DNA fragment in human lymphocytes?

- (A) λ phage
- (B) Ti plasmid
- (C) Retrovirus
- (D) pBR 322

NEET 2018 · Q99

8. Use of bioresources by multinational companies and organisations without authorisation from the concerned country and its people is called

- (A) Biodegradation
- (B) Biopiracy
- (C) Bio-infringement
- (D) Bioexploitation

NEET 2018 · Q100

9. In India, the organisation responsible for assessing the safety of introducing genetically modified organisms for public use is

- (A) Research Committee on Genetic Manipulation (RCGM)
- (B) Council for Scientific and Industrial Research (CSIR)
- (C) Indian Council of Medical Research (ICMR)
- (D) Genetic Engineering Appraisal Committee (GEAC)

NEET 2018 · Q101

10. The correct order of steps in Polymerase Chain Reaction (PCR) is

- (A) Denaturation, Extension, Annealing
- (B) Annealing, Extension, Denaturation
- (C) Extension, Denaturation, Annealing
- (D) Denaturation, Annealing, Extension

NEET 2018 · Q102

11. Select the correct match:

- (A) T.H. Morgan – Transduction
- (B) $F_2 \times$ Recessive parent – Dihybrid cross
- (C) Ribozyme – Nucleic acid
- (D) G. Mendel – Transformation

NEET 2018 · Q103

12. 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

- (A) Lerma Rojo
- (B) Sharbati Sonora
- (C) Co-667
- (D) Basmati

NEET 2018 · Q104

13. Which of the following pairs is wrongly matched?

- (A) XO type sex determination : Grasshopper
- (B) ABO blood grouping : Co-dominance
- (C) Starch synthesis in pea : Multiple alleles
- (D) T.H. Morgan : Linkage

NEET 2018 · Q105

14. Select the correct statement:

- (A) Spliceosomes take part in translation.
- (B) Punnett square was developed by a British scientist.
- (C) Franklin Stahl coined the term "linkage".
- (D) Transduction was discovered by S. Altman.

NEET 2018 · Q106

15. The experimental proof for semiconservative replication of DNA was first shown in a

- (A) Plant
- (B) Bacterium
- (C) Fungus
- (D) Virus

NEET 2018 · Q107

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

- (A) Mango
- (B) Jackfruit
- (C) Bamboo species
- (D) Papaya

NEET 2018 · Q108

17. Offsets are produced by

- (A) Parthenocarpy
- (B) Mitotic divisions
- (C) Meiotic divisions
- (D) Parthenogenesis

NEET 2018 · Q109

18. Select the correct match:

- (A) Matthew Meselson and F. Stahl – *Pisum sativum*
- (B) Alfred Hershey and Martha Chase – TMV
- (C) Alec Jeffreys – *Streptococcus pneumoniae*
- (D) Francois Jacob and Jacques Monod – Lac operon

NEET 2018 · Q110

19. Which of the following has proved helpful in preserving pollen as fossils?

- (A) Oil content
- (B) Cellulosic intine
- (C) Pollenkitt
- (D) Sporopollenin

NEET 2018 · Q111

20. Natality refers to

- (A) Number of individuals leaving the habitat
- (B) Birth rate
- (C) Death rate
- (D) Number of individuals entering a habitat

NEET 2018 · Q112

21. World Ozone Day is celebrated on

- (A) 16th September
- (B) 21st April
- (C) 5th June
- (D) 22nd April

NEET 2018 · Q113

22. Which of the following is a secondary pollutant?

- (A) SO₂
- (B) CO₂
- (C) CO
- (D) O₃

NEET 2018 · Q114

23. Niche is

- (A) the range of temperature that the organism needs to live
- (B) the physical space where an organism lives
- (C) all the biological factors in the organism's environment
- (D) the functional role played by the organism where it lives

NEET 2018 · Q115

24. What type of ecological pyramid would be obtained with the following data?

Secondary consumer : 120 g

Primary consumer : 60 g

Primary producer : 10 g

- (A) Upright pyramid of numbers
- (B) Pyramid of energy
- (C) Inverted pyramid of biomass
- (D) Upright pyramid of biomass

NEET 2018 · Q116

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

- (A) Fe
- (B) Cl
- (C) Carbon
- (D) Oxygen

NEET 2018 · Q117

26. The two functional groups characteristic of sugars are

- (A) carbonyl and phosphate
- (B) carbonyl and methyl
- (C) hydroxyl and methyl
- (D) carbonyl and hydroxyl

NEET 2018 · Q118

27. Which among the following is not a prokaryote?

- (A) Nostoc
- (B) Mycobacterium
- (C) Saccharomyces
- (D) Oscillatoria

NEET 2018 · Q119

28. The Golgi complex participates in

- (A) Respiration in bacteria
- (B) Formation of secretory vesicles
- (C) Fatty acid breakdown
- (D) Activation of amino acid

NEET 2018 · Q120

29. Which of the following is not a product of light reaction of photosynthesis?

- (A) NADPH
- (B) NADH
- (C) ATP
- (D) Oxygen

NEET 2018 · Q121

30. Which of the following is true for nucleolus?

- (A) It takes part in spindle formation.
- (B) It is a membrane-bound structure.
- (C) Larger nucleoli are present in dividing cells.
- (D) It is a site for active ribosomal RNA synthesis.

NEET 2018 · Q122

31. Stomatal movement is not affected by

- (A) O₂ concentration
- (B) Light
- (C) Temperature
- (D) CO₂ concentration

NEET 2018 · Q123

32. The stage during which separation of the paired homologous chromosomes begins is

- (A) Diakinesis
- (B) Diplotene
- (C) Pachytene
- (D) Zygotene

NEET 2018 · Q124

33. Stomata in grass leaf are

- (A) Rectangular
- (B) Kidney shaped
- (C) Dumb-bell shaped
- (D) Barrel shaped

NEET 2018 · Q125

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

- (A) Phellogen
- (B) Vascular cambium
- (C) Apical meristems
- (D) Axillary meristems

NEET 2018 · Q126

35. Pneumatophores occur in

- (A) Carnivorous plants
- (B) Free-floating hydrophytes
- (C) Halophytes
- (D) Submerged hydrophytes

NEET 2018 · Q127

36. Casparian strips occur in

- (A) Cortex
- (B) Pericycle
- (C) Epidermis
- (D) Endodermis

NEET 2018 · Q128

37. Plants having little or no secondary growth are

- (A) Conifers
- (B) Deciduous angiosperms
- (C) Grasses
- (D) Cycads

NEET 2018 · Q129

38. Sweet potato is a modified

- (A) Tap root
- (B) Adventitious root
- (C) Stem
- (D) Rhizome

NEET 2018 · Q130

39. Which of the following statements is correct?

- (A) Horsetails are gymnosperms.
- (B) Selaginella is heterosporous, while Salvinia is homosporous.
- (C) Ovules are not enclosed by ovary wall in gymnosperms.
- (D) Stems are usually unbranched in both Cycas and Cedrus.

NEET 2018 · Q131

40. Select the wrong statement:

- (A) Pseudopodia are locomotory and feeding structures in Sporozoans.
- (B) Mushrooms belong to Basidiomycetes.
- (C) Cell wall is present in members of Fungi and Plantae.
- (D) Mitochondria are the powerhouse of the cell in all kingdoms except Monera.

NEET 2018 · Q132

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

- (A) Agaricus
- (B) Alternaria
- (C) Neurospora
- (D) Saccharomyces

NEET 2018 · Q133

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

Column I: a. Herbarium, b. Key, c. Museum, d. Catalogue

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

- (A) a-ii, b-iv, c-iii, d-i
- (B) a-iii, b-ii, c-i, d-iv
- (C) a-i, b-iv, c-iii, d-ii
- (D) a-iii, b-iv, c-i, d-ii

NEET 2018 · Q134

43. Winged pollen grains are present in

- (A) Mango
- (B) Cycas
- (C) Mustard
- (D) Pinus

NEET 2018 · Q135

44. Which one is wrongly matched?

- (A) Gemma cups – Marchantia
- (B) Biflagellate zoospores – Brown algae
- (C) Uniflagellate gametes – Polysiphonia
- (D) Unicellular organism – Chlorella

NEET 2018 · Q136

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

- (A) Increased respiratory surface; Inflammation of bronchioles
- (B) Increased number of bronchioles; Increased respiratory surface
- (C) Inflammation of bronchioles; Decreased respiratory surface
- (D) Decreased respiratory surface; Inflammation of bronchioles

NEET 2018 · Q137

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

Column I: a. Tricuspid valve, b. Bicuspid valve, c. Semilunar valve

Column II: i. Between left atrium and left ventricle, ii. Between right ventricle and pulmonary artery, iii. Between right atrium and right ventricle

- (A) a-i, b-ii, c-iii
- (B) a-i, b-iii, c-ii
- (C) a-iii, b-i, c-ii
- (D) a-ii, b-i, c-iii

NEET 2018 · Q138

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

Column I: a. Tidal volume, b. Inspiratory Reserve volume, c. Expiratory Reserve volume, d. Residual volume

Column II: i. 2500 - 3000 mL, ii. 1100 - 1200 mL, iii. 500 - 550 mL, iv. 1000 - 1100 mL

- (A) a-i, b-iv, c-ii, d-iii
- (B) a-iii, b-i, c-iv, d-ii
- (C) a-iii, b-ii, c-i, d-iv
- (D) a-iv, b-iii, c-ii, d-i

NEET 2018 · Q139

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

- (A) smooth muscles attached to the iris
- (B) ligaments attached to the iris
- (C) ligaments attached to the ciliary body
- (D) smooth muscles attached to the ciliary body

NEET 2018 · Q140

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

- (A) Estradiol
- (B) Ecdysone
- (C) Epinephrine
- (D) Estriol

NEET 2018 · Q141

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

- (A) Estrogen and Parathyroid hormone
- (B) Progesterone and Aldosterone
- (C) Aldosterone and Prolactin
- (D) Parathyroid hormone and Prolactin

NEET 2018 · Q142

51. Which of the following structures or regions is incorrectly paired with its function?

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

NEET 2018 · Q143

52. The amnion of mammalian embryo is derived from

- (A) mesoderm and trophoblast
- (B) endoderm and mesoderm
- (C) ectoderm and mesoderm
- (D) ectoderm and endoderm

NEET 2018 · Q144

53. Hormones secreted by the placenta to maintain pregnancy are

- (A) hCG, hPL, progesterones, estrogens
- (B) hCG, hPL, estrogens, relaxin, oxytocin
- (C) hCG, hPL, progesterones, prolactin
- (D) hCG, progesterones, estrogens, glucocorticoids

NEET 2018 · Q145

54. The difference between spermiogenesis and spermiation is

- (A) In spermiogenesis spermatozoa from sertoli cells are released into the cavity of seminiferous tubules, while in spermiation spermatozoa are formed.
- (B) In spermiogenesis spermatozoa are formed, while in spermiation spermatids are formed.
- (C) In spermiogenesis spermatids are formed, while in spermiation spermatozoa are formed.
- (D) In spermiogenesis spermatozoa are formed, while in spermiation spermatozoa are released from sertoli cells into the cavity of seminiferous tubules.

NEET 2018 · Q146

55. The contraceptive 'SAHELI'

- (A) is an IUD.
- (B) increases the concentration of estrogen and prevents ovulation in females.
- (C) blocks estrogen receptors in the uterus, preventing eggs from getting implanted.
- (D) is a post-coital contraceptive.

NEET 2018 · Q147

56. Ciliates differ from all other protozoans in

- (A) using pseudopodia for capturing prey
- (B) having a contractile vacuole for removing excess water
- (C) using flagella for locomotion
- (D) having two types of nuclei

NEET 2018 · Q148

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

- (A) Aves
- (B) Reptilia
- (C) Amphibia
- (D) Osteichthyes

NEET 2018 · Q149

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

- (A) Forewings with darker tegmina
- (B) Presence of caudal styles
- (C) Presence of a boat shaped sternum on the 9th abdominal segment
- (D) Presence of anal cerci

NEET 2018 · Q150

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

- (A) Camelus
- (B) Chelone
- (C) Macropus
- (D) Psittacula

NEET 2018 · Q151

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

- (A) Moth
- (B) Tunicate
- (C) Earthworm
- (D) Starfish

NEET 2018 · Q152

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

- (A) Cyanobacteria
- (B) Diatoms
- (C) Dinoflagellates
- (D) Euglenoids

NEET 2018 · Q154

62. All of the following are included in 'Ex-situ conservation' except

- (A) Botanical gardens
- (B) Sacred groves
- (C) Wildlife safari parks
- (D) Seed banks

NEET 2018 · Q155

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

Column I: a. Eutrophication, b. Sanitary landfill, c. Snow blindness, d. Jhum cultivation

Column II: i. UV-B radiation, ii. Deforestation, iii. Nutrient enrichment, iv. Waste disposal

- (A) a-iii, b-iv, c-i, d-ii
- (B) a-i, b-iii, c-iv, d-ii
- (C) a-ii, b-i, c-iii, d-iv
- (D) a-i, b-ii, c-iv, d-iii

NEET 2018 · Q156

64. In a growing population of a country,

- (A) reproductive and pre-reproductive individuals are equal in number.
- (B) reproductive individuals are less than the post-reproductive individuals.
- (C) pre-reproductive individuals are more than the reproductive individuals.
- (D) pre-reproductive individuals are less than the reproductive individuals.

NEET 2018 · Q157

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

- (A) Roots
- (B) Latex
- (C) Flowers
- (D) Leaves

NEET 2018 · Q158

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

- (A) an enhancer
- (B) structural genes
- (C) an operator
- (D) a promoter

NEET 2018 · Q159

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

- (A) Only grandchildren
- (B) Only sons
- (C) Only daughters
- (D) Both sons and daughters

NEET 2018 · Q160

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

- (A) Phenotypic variations
- (B) Saltation
- (C) Multiple step mutations
- (D) Minor mutations

NEET 2018 · Q161

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

- (A) ACCUAUGCGAU
- (B) UGGTUTCGCAT
- (C) AGGUAUCGCAU
- (D) UCCAUAGCGUA

NEET 2018 · Q162

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

Column I: a. Proliferative Phase, b. Secretory Phase, c. Menstruation

Column II: i. Breakdown of endometrial lining, ii. Follicular Phase, iii. Luteal Phase

- (A) a-ii, b-iii, c-i
- (B) a-i, b-iii, c-ii
- (C) a-iii, b-ii, c-i
- (D) a-iii, b-i, c-ii

NEET 2018 · Q163

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

Column I: a. Glycosuria, b. Gout, c. Renal calculi, d. Glomerular nephritis

Column II: i. Accumulation of uric acid in joints, ii. Mass of crystallised salts within the kidney, iii. Inflammation in glomeruli, iv. Presence of glucose in urine

- (A) a-ii, b-iii, c-i, d-iv
- (B) a-i, b-ii, c-iii, d-iv
- (C) a-iii, b-ii, c-iv, d-i
- (D) a-iv, b-i, c-ii, d-iii

NEET 2018 · Q164

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

Column I (Function): a. Ultrafiltration, b. Concentration of urine, c. Transport of urine, d. Storage of urine

Column II (Part of Excretory System): i. Henle's loop, ii. Ureter, iii. Urinary bladder, iv. Malpighian corpuscle, v. Proximal convoluted tubule

- (A) a-v, b-iv, c-i, d-ii
- (B) a-iv, b-i, c-ii, d-iii
- (C) a-iv, b-v, c-ii, d-iii
- (D) a-v, b-iv, c-i, d-iii

NEET 2018 · Q165

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

- (A) Goblet cells
- (B) Mucous cells
- (C) Chief cells
- (D) Parietal cells

NEET 2018 · Q166

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

Column I: a. Fibrinogen, b. Globulin, c. Albumin

Column II: i. Osmotic balance, ii. Blood clotting, iii. Defence mechanism

- (A) a-i, b-iii, c-ii
- (B) a-i, b-ii, c-iii
- (C) a-iii, b-ii, c-i
- (D) a-ii, b-iii, c-i

NEET 2018 · Q168

75. Calcium is important in skeletal muscle contraction because it

- (A) detaches the myosin head from the actin filament.
- (B) activates the myosin ATPase by binding to it.
- (C) binds to troponin to remove the masking of active sites on actin for myosin.
- (D) prevents the formation of bonds between the myosin cross bridges and the actin filament.

NEET 2018 · Q169

76. Nissl bodies are mainly composed of

- (A) Nucleic acids and SER
- (B) DNA and RNA
- (C) Proteins and lipids
- (D) Free ribosomes and RER

NEET 2018 · Q170

77. Which of these statements is incorrect?

- (A) Glycolysis operates as long as it is supplied with NAD that can pick up hydrogen atoms.
- (B) Glycolysis occurs in cytosol.
- (C) Enzymes of TCA cycle are present in mitochondrial matrix.
- (D) Oxidative phosphorylation takes place in outer mitochondrial membrane.

NEET 2018 · Q171

78. Select the incorrect match:

- (A) Submetacentric chromosomes – L-shaped chromosomes
- (B) Allosomes – Sex chromosomes
- (C) Lampbrush chromosomes – Diplotene bivalents
- (D) Polytene chromosomes – Oocytes of amphibians

NEET 2018 · Q172

79. Which of the following terms describe human dentition?

- (A) Pleurodont, Monophyodont, Homodont
- (B) Thecodont, Diphyodont, Heterodont
- (C) Thecodont, Diphyodont, Homodont
- (D) Pleurodont, Diphyodont, Heterodont

NEET 2018 · Q174

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

- (A) Plastidome
- (B) Polyhedral bodies
- (C) Polysome
- (D) Nucleosome

NEET 2018 · Q175

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

- (A) Ringworm disease
- (B) Ascariasis
- (C) Elephantiasis
- (D) Amoebiasis

NEET 2018 · Q176

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

- (A) Alzheimer's disease
- (B) Rheumatoid arthritis
- (C) Psoriasis
- (D) Vitiligo

NEET 2018 · Q177

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

- (A) Brain of bat, man and cheetah
- (B) Heart of bat, man and cheetah
- (C) Forelimbs of man, bat and cheetah
- (D) Eye of octopus, bat and man

NEET 2018 · Q178

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

- (A) Vitamin B₁₂
- (B) Vitamin A
- (C) Vitamin D
- (D) Vitamin E

NEET 2018 · Q179

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

- (A) Convergent evolution
- (B) Analogy
- (C) Homology
- (D) Adaptive radiation

NEET 2018 · Q180

86. 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**

- (A) Co-dominance, Incomplete dominance and Polygenic inheritance
- (B) Dominance, Co-dominance and Multiple allele
- (C) Co-dominance, Multiple allele and Polygenic inheritance
- (D) Dominance, Multiple allele and Polygenic inheritance

Answer key and explanations

1. Answer: (C) Green sulphur bacteria

Green sulphur bacteria carry out anoxygenic photosynthesis: they use H₂S rather than water as the electron donor, so sulphur, not oxygen, is released. Nostoc is a cyanobacterium and, like Cycas and Chara, splits water and evolves oxygen.

2. Answer: (D) Syngamy and triple fusion

In angiosperms one male gamete fuses with the egg (syngamy) and the other fuses with the two polar nuclei (triple fusion); the two fusions together in one embryo sac are called double fertilization. Fusion of one male gamete with the polar nuclei is only triple fusion, one half of the process.

3. Answer: (B) Yucca

Yucca is pollinated only by the yucca moth, which lays its eggs in the ovary of the flower; the larvae feed on some developing seeds. The plant cannot set seed without the moth and the moth cannot complete its life cycle without the flower. Hydrilla is water-pollinated and Viola has cleistogamous flowers.

4. Answer: (A) -196°C

Liquid nitrogen boils at about -196°C , and pollen cryopreserved at this temperature stays viable for years, forming pollen banks used in crop breeding. The other temperatures are not the temperature of liquid nitrogen.

5. Answer: (A) Potassium

Potassium is the main cation that maintains cell turgor and anion-cation balance, and its movement into guard cells drives stomatal opening. Sodium is not an essential macronutrient for most plants, magnesium is part of chlorophyll and calcium is used in the middle lamella.

6. Answer: (B) It functions as an electron carrier.

NAD^{+} is a coenzyme that accepts electrons and hydrogen during glycolysis and the Krebs cycle, becoming NADH, and hands them to the electron transport chain. It is not an enzyme itself, and it is not a final electron acceptor; NADH is reoxidised during fermentation but the final acceptor there is an organic molecule such as pyruvate or acetaldehyde.

7. Answer: (C) Retrovirus

In gene therapy (for example ADA deficiency), a functional gene is put into a patient's lymphocytes using a disabled retroviral vector, because retroviruses integrate their DNA into the host genome. λ phage and pBR322 are vectors for bacteria and the Ti plasmid is used for plants.

8. Answer: (B) Biopiracy

Biopiracy is the use of a country's bioresources and traditional knowledge by multinational companies without proper authorisation or compensation to the country and its people. Biodegradation is breakdown of matter by microbes, and the other two terms are not the standard name for this practice.

9. Answer: (D) Genetic Engineering Appraisal Committee (GEAC)

The Indian Government set up GEAC to decide on the validity of GM research and the safety of introducing GM organisms for public services. RCGM oversees research-level work, while CSIR and ICMR are general research councils.

10. Answer: (D) Denaturation, Annealing, Extension

Each PCR cycle first denatures double-stranded DNA by heat, then lets the primers anneal to the single strands at a lower temperature, and finally Taq polymerase extends the primers. Extension cannot happen before annealing because the polymerase needs a primer to start from.

11. Answer: (C) Ribozyme - Nucleic acid

A ribozyme is a catalytic RNA, such as the peptidyl transferase activity of rRNA, so it is a nucleic acid. Morgan is linked with linkage, a cross of the F_2 (or F_1) with the recessive parent is a test cross, and transformation was discovered by Griffith, not Mendel.

12. Answer: (D) Basmati

In 1997 an American company obtained a patent on a Basmati-derived rice, although Basmati varieties have been grown in India for centuries; NCERT cites it as an example of biopiracy. Lerma Rojo and Sharbati Sonora are wheat varieties and Co-667 is a sugarcane variety.

13. Answer: (C) Starch synthesis in pea : Multiple alleles

Starch synthesis in pea is controlled by one gene with two alleles (B and b); it is NCERT's example of incomplete dominance at the level of starch grain size and of pleiotropy, not of multiple alleles. Grasshopper has XO sex determination, the I^A and I^B alleles of ABO are co-dominant and Morgan worked out linkage.

14. Answer: (B) Punnett square was developed by a British scientist.

The Punnett square is named after Reginald C. Punnett, a British geneticist. Spliceosomes act in splicing of hnRNA, not translation; Morgan coined the term linkage; and transduction was discovered by Zinder and Lederberg, while Altman is known for ribozymes.

15. Answer: (B) Bacterium

Meselson and Stahl (1958) grew *Escherichia coli* in ^{15}N medium and then ^{14}N medium and showed hybrid and light DNA by density gradient centrifugation, the first proof of semiconservative replication. Taylor later showed the same in *Vicia faba*, a plant, so the plant option is the later, not the first, proof.

16. Answer: (C) Bamboo species

Bamboo species are monocarpic: they grow vegetatively for 50 to 100 years, flower once, produce seeds and die. Mango, jackfruit and papaya are polycarpic perennials that flower every season.

17. Answer: (B) Mitotic divisions

An offset is a vegetative propagule (as in *Eichhornia* or *Pistia*), so it arises by mitotic divisions and its cells are genetically identical to the parent. Meiosis forms gametes, and parthenocarp and parthenogenesis concern fruit or embryo development without fertilisation.

18. Answer: (D) Francois Jacob and Jacques Monod - Lac operon

Jacob and Monod proposed the lac operon model of gene regulation in *E. coli*. Meselson and Stahl worked on *E. coli*, Hershey and Chase used bacteriophage T2, and Alec Jeffreys developed DNA fingerprinting; *Streptococcus pneumoniae* was Griffith's organism.

19. Answer: (D) Sporopollenin

The exine of pollen is made of sporopollenin, one of the most resistant organic materials, which withstands high temperature, strong acids and alkalis and is not degraded by enzymes, so pollen is well preserved as fossils. The intine is thin cellulose-pectin and pollenkit is a sticky oily coat; neither survives.

20. Answer: (B) Birth rate

Natality is the number of births in a population during a given period, i.e. the birth rate, and it adds to population density. Individuals leaving the habitat is emigration, individuals entering is immigration, and the death rate is mortality.

21. Answer: (A) 16th September

World Ozone Day (International Day for the Preservation of the Ozone Layer) is observed on 16 September, the date of signing of the Montreal Protocol in 1987. 5 June is World Environment Day and 22 April is Earth Day.

22. Answer: (D) O_3

Ground-level ozone is not emitted directly; it forms in the air when nitrogen oxides and hydrocarbons react in sunlight (photochemical smog), so it is a secondary pollutant. SO_2 , CO_2 and CO are released directly from combustion and are primary pollutants.

23. Answer: (D) the functional role played by the organism where it lives

An ecological niche is the functional role of an organism in its habitat, including the range of conditions it tolerates and the resources it uses. The physical space where it lives is its habitat, and a temperature range alone is only one dimension of the niche.

24. Answer: (C) Inverted pyramid of biomass

The data are masses (biomass), and they increase from producers (10 g) to primary consumers (60 g) to secondary consumers (120 g), so the base is the narrowest level and the pyramid of biomass is inverted, as in some aquatic ecosystems. Grams are not numbers of individuals or energy units, so the other pyramid types do not fit.

25. Answer: (B) Cl

UV radiation breaks CFCs in the stratosphere to release chlorine atoms, which break O_3 into O_2 and are regenerated, so each Cl atom acts as a catalyst and destroys many ozone molecules. Iron and carbon do not act this way, and oxygen is a product, not the catalyst.

26. Answer: (D) carbonyl and hydroxyl

Sugars are polyhydroxy aldehydes or ketones, so they carry several hydroxyl groups and one carbonyl group (aldehyde or keto). Phosphate occurs only in sugar phosphates and nucleotides, and a methyl group is not characteristic of sugars.

27. Answer: (C) Saccharomyces

Saccharomyces is yeast, a unicellular fungus with a true nucleus, so it is a eukaryote. *Nostoc* and *Oscillatoria* are cyanobacteria and *Mycobacterium* is a bacterium, all prokaryotes.

28. Answer: (B) Formation of secretory vesicles

The Golgi apparatus packages and modifies materials received from the ER and buds them off as secretory vesicles from its trans face. Bacteria have no Golgi, fatty acid breakdown occurs in mitochondria and peroxisomes, and amino acid activation occurs in the cytoplasm by aminoacyl-tRNA synthetases.

29. Answer: (B) NADH

The light reaction produces ATP, NADPH and O_2 (from photolysis of water). NADH is a product of respiration (glycolysis and the Krebs cycle), not of photosynthesis.

30. Answer: (D) It is a site for active ribosomal RNA synthesis.

The nucleolus is a non-membrane-bound body in the nucleus where rRNA is actively synthesised. It is not membrane-bound, it disappears during cell division instead of forming the spindle, and larger, more numerous nucleoli occur in cells actively making proteins, not specifically in dividing cells.

31. Answer: (A) O_2 concentration

Stomatal opening and closing respond to light, temperature, CO_2 concentration and water status (through abscisic acid and the turgor of guard cells). Oxygen concentration has no significant effect on stomatal movement.

32. Answer: (B) Diplotene

In diplotene the synaptonemal complex dissolves and the homologous chromosomes of each bivalent begin to separate, remaining joined only at the chiasmata. Pairing (synapsis) occurs in zygotene and crossing over in pachytene, while in diakinesis the chiasmata terminalise.

33. Answer: (C) Dumb-bell shaped

In grasses (monocots) the guard cells are dumb-bell shaped. Kidney (bean) shaped guard cells are typical of dicot leaves, which is the main trap.

34. Answer: (B) Vascular cambium

The vascular cambium is a lateral meristem that cuts off secondary xylem towards the inside and secondary phloem towards the outside. Phellogen (cork cambium) forms cork and secondary cortex, while apical and axillary meristems produce primary tissues.

35. Answer: (C) Halophytes

Pneumatophores are negatively geotropic respiratory roots of mangroves such as *Rhizophora*, which are halophytes growing in waterlogged saline swamps where the soil is poor in oxygen. Hydrophytes take oxygen directly from the water or air and do not need them.

36. Answer: (D) Endodermis

The tangential and radial walls of root endodermal cells carry a band of suberin called the Casparian strip, which blocks the apoplastic movement of water. The pericycle lies just inside the endodermis but has no such strips.

37. Answer: (C) Grasses

Grasses are monocots with closed vascular bundles that lack cambium, so they show little or no secondary growth. Conifers and deciduous dicot trees have an active vascular cambium and form wood; cycads also show secondary growth.

38. Answer: (B) Adventitious root

The edible part of sweet potato is a swollen adventitious root that stores food. It is not a stem or rhizome, unlike potato (a stem tuber), and it is not a tap root like carrot or radish.

39. Answer: (C) Ovules are not enclosed by ovary wall in gymnosperms.

Gymnosperms have naked ovules that are not enclosed in an ovary, which is the basis of their name. Horsetails (*Equisetum*) are pteridophytes, both *Selaginella* and *Salvinia* are heterosporous, and *Cedrus* has a branched stem although *Cycas* is unbranched.

40. Answer: (A) Pseudopodia are locomotory and feeding structures in Sporozoans.

Sporozoans such as *Plasmodium* have no locomotory structures; pseudopodia are found in amoeboid protozoans (sarcodines). Mushrooms are basidiomycetes, fungi and plants have cell walls, and *Monera* lack mitochondria while all other kingdoms have them.

41. Answer: (A) Agaricus

In *Agaricus* (a basidiomycete) karyogamy and meiosis occur in the basidium and the four basidiospores are borne exogenously on it. In *Neurospora* and *Saccharomyces* (ascomycetes) the meiospores form endogenously in an ascus, and *Alternaria* is a deuteromycete with no known sexual stage.

42. Answer: (D) a-iii, b-iv, c-i, d-ii

A herbarium stores dried, pressed plant specimens on sheets; a key lists contrasting characters (couplets) used to identify taxa; a museum holds preserved plants and animals; and a catalogue is a methodical list of species of an area with brief descriptions. The trap is swapping key and catalogue, since both are written aids.

43. Answer: (D) Pinus

Pinus pollen grains have two air-filled wings (sacs) that help in wind dispersal. Cycas pollen is wingless, and mango and mustard are angiosperms with ordinary pollen.

44. Answer: (C) Uniflagellate gametes - Polysiphonia

Polysiphonia is a red alga, and red algae have no flagellated cells at any stage, so pairing it with uniflagellate gametes is the wrong match. Chlorella is indeed a unicellular green alga, Marchantia bears gemma cups and brown algae produce pear-shaped biflagellate zoospores, so those pairs are correct.

45. Answer: (C) Inflammation of bronchioles; Decreased respiratory surface

Asthma is difficulty in breathing caused by inflammation of the bronchi and bronchioles. Emphysema is a chronic disorder in which alveolar walls are damaged, so the respiratory surface decreases. The reversed pairing is the main trap.

46. Answer: (C) a-iii, b-i, c-ii

The tricuspid valve guards the opening between the right atrium and right ventricle, the bicuspid (mitral) valve lies between the left atrium and left ventricle, and a semilunar valve guards the exit from the right ventricle into the pulmonary artery. Swapping the tricuspid and bicuspid sides is the usual error.

47. Answer: (B) a-iii, b-i, c-iv, d-ii

NCERT gives tidal volume about 500 mL, inspiratory reserve volume 2500–3000 mL, expiratory reserve volume 1000–1100 mL and residual volume 1100–1200 mL. The close values of ERV and RV are the trap; residual volume is the slightly larger one.

48. Answer: (C) ligaments attached to the ciliary body

The lens is held by suspensory ligaments (zonules) attached to the ciliary body. The ciliary body contains smooth muscle that changes lens curvature, but the lens itself hangs from ligaments; the iris only controls the pupil size.

49. Answer: (C) Epinephrine

Epinephrine (adrenaline) is a catecholamine made from the amino acid tyrosine. Estradiol and estriol are steroid hormones made from cholesterol, and ecdysone is an insect steroid hormone.

50. Answer: (A) Estrogen and Parathyroid hormone

Osteoporosis is loss of bone mass, common after menopause when estrogen, which protects bone, falls; parathyroid hormone raises blood calcium by bone resorption, so its excess also weakens bone. Aldosterone, progesterone and prolactin have no major role in bone mineral balance.

51. Answer: (B) Limbic system : consists of fibre tracts that interconnect different regions of brain; controls movement.

The limbic system (amygdala, hippocampus and related structures) regulates emotion, sexual behaviour and motivation, not movement; movement is coordinated by the cerebellum and motor cortex. The hypothalamus, medulla oblongata and corpus callosum are paired with their correct roles.

52. Answer: (C) ectoderm and mesoderm

The amnion is formed from extra-embryonic ectoderm lined on the outside by extra-embryonic (somatic) mesoderm, i.e. the somatopleure. The yolk sac and allantois, by contrast, are formed from endoderm with splanchnic mesoderm, and the chorion includes the trophoblast.

53. Answer: (A) hCG, hPL, progestogens, estrogens

NCERT lists the placental hormones as human chorionic gonadotropin, human placental lactogen, estrogens and progestogens, which together maintain pregnancy. Oxytocin is released from the posterior pituitary and prolactin from the anterior pituitary, and glucocorticoids come from the adrenal cortex.

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

Spermiogenesis is the transformation of spermatids into spermatozoa, and spermiation is the release of the spermatozoa, whose heads were embedded in Sertoli cells, into the lumen of the seminiferous tubules. Spermatids themselves are formed earlier by the second meiotic division, so options that make spermatids the product of either step are wrong.

55. Answer: (C) blocks estrogen receptors in the uterus, preventing eggs from getting implanted.

Saheli (centchroman) is a once-a-week non-steroidal oral pill developed by CDRI Lucknow; it acts as an anti-estrogen at the uterus and prevents implantation. It is a pill, not an IUD, it does not raise estrogen levels, and it is taken regularly rather than as an emergency post-coital pill.

56. Answer: (D) having two types of nuclei

Ciliates such as *Paramecium* have a large macronucleus and a small micronucleus, a feature unique to them among protozoans. Contractile vacuoles also occur in freshwater amoebae and flagellates, pseudopodia belong to amoeboid protozoans and flagella to flagellates.

57. Answer: (A) Aves

Birds have a crop to store food and a muscular gizzard to grind it, since they have no teeth; NCERT lists these as additional chambers of the bird digestive tract. Reptiles, amphibians and bony fishes do not have this crop-and-gizzard arrangement.

58. Answer: (B) Presence of caudal styles

Only male cockroaches have a pair of short, thread-like anal (caudal) styles on the 9th abdominal sternum. Anal cerci are present in both sexes, both have tegmina, and the boat-shaped sternum belongs to the 7th segment of the female.

59. Answer: (B) Chelone

Chelone is a turtle, a reptile, so it is poikilothermic (cold-blooded). *Camelus* (camel) and *Macropus* (kangaroo) are mammals and *Psittacula* (parrot) is a bird, all of which are homeotherms.

60. Answer: (C) Earthworm

Earthworm shows direct development: young worms hatch from cocoons with no larval stage, so there is no metamorphosis. Moths pass through caterpillar and pupa, tunicates have a tadpole larva that undergoes retrogressive metamorphosis, and starfish have a bilateral larva that becomes the radial adult.

61. Answer: (B) Diatoms

NCERT describes diatoms as the chief producers in the oceans. Dinoflagellates are mostly marine photosynthetic protists too, and cyanobacteria are important producers, but the textbook title of chief producers belongs to diatoms; euglenoids are mostly freshwater.

62. Answer: (B) Sacred groves

Sacred groves are tracts of natural forest protected by local communities, so species are conserved in their own habitat; this is in-situ conservation. Botanical gardens, wildlife safari parks and seed banks keep organisms or germplasm away from their natural habitat and are ex-situ methods.

63. Answer: (A) a-iii, b-iv, c-i, d-ii

Eutrophication is the nutrient enrichment of water bodies, a sanitary landfill is a method of solid waste disposal, snow blindness is inflammation of the cornea caused by high UV-B, and slash-and-burn jhum cultivation causes deforestation.

64. Answer: (C) pre-reproductive individuals are more than the reproductive individuals.

A growing (expanding) population has a broad-based, triangular age pyramid, meaning pre-reproductive individuals outnumber reproductive ones. Roughly equal numbers give a bell-shaped, stable pyramid, and fewer pre-reproductive individuals give an urn-shaped, declining one.

65. Answer: (B) Latex

Smack (heroin, diacetylmorphine) is made by acetylation of morphine, which is extracted from the latex of the unripe capsules of the poppy *Papaver somniferum*. Roots, flowers and leaves are not the source.

66. Answer: (A) an enhancer

An operon such as the lac operon consists of a promoter, an operator and structural genes (with a regulator gene nearby). Enhancers are regulatory DNA sequences of eukaryotic genes that can act from a distance and are not parts of prokaryotic operons.

67. Answer: (D) Both sons and daughters

A mother passes one of her two X chromosomes to every child, sons and daughters alike, so either sex can receive the affected X. It is the father's X that goes only to daughters, which is the trap.

68. Answer: (B) Saltation

From his work on evening primrose, de Vries proposed that new species arise by large, sudden mutations producing single-step jumps, which he called saltation. Darwin, in contrast, stressed small continuous variations, so minor or multiple-step changes describe Darwinian ideas, not de Vries.

69. Answer: (C) AGGUAUCGCAU

The mRNA has the same sequence and polarity as the coding strand, except that uracil replaces thymine, so AGGTATCGCAT becomes AGGUAUCGCAU. The complementary sequence UCCAUAGCGUA would be obtained by copying the coding strand itself, which is the trap.

70. Answer: (A) a-ii, b-iii, c-i

The proliferative phase of the uterus, when the endometrium regenerates, coincides with the follicular phase of the ovary; the secretory phase coincides with the luteal phase, when the corpus luteum secretes progesterone; and menstruation is the breakdown of the endometrial lining.

71. Answer: (D) a-iv, b-i, c-ii, d-iii

Glycosuria is glucose in the urine, gout is accumulation of uric acid crystals in joints, renal calculi are masses of crystallised salts in the kidney, and glomerulonephritis is inflammation of the glomeruli.

72. Answer: (B) a-iv, b-i, c-ii, d-iii

Ultrafiltration happens in the Malpighian corpuscle (glomerulus with Bowman's capsule); the loop of Henle sets up the counter-current gradient that concentrates urine; the ureter carries urine; and the urinary bladder stores it. The proximal convoluted tubule mainly reabsorbs and is the distractor.

73. Answer: (D) Parietal cells

Parietal (oxyntic) cells secrete HCl and Castle's intrinsic factor, which is needed to absorb vitamin B₁₂; B₁₂ is required for the maturation of red blood cells, so these cells help erythropoiesis indirectly. Chief cells secrete pepsinogen and goblet or mucous cells secrete mucus.

74. Answer: (D) a-ii, b-iii, c-i

Fibrinogen is converted to fibrin during blood clotting, globulins (including antibodies) are mainly involved in the defence mechanisms of the body, and albumin maintains the osmotic balance of blood.

75. Answer: (C) binds to troponin to remove the masking of active sites on actin for myosin.

Ca²⁺ released from the sarcoplasmic reticulum binds to troponin C, which moves tropomyosin and unmasks the myosin-binding active sites on actin so that cross bridges can form. Calcium does not bind myosin ATPase directly, and detachment of the myosin head requires a fresh ATP, not calcium.

76. Answer: (D) Free ribosomes and RER

Nissl granules in the cell body and dendrites of neurons are clusters of rough endoplasmic reticulum with attached and free ribosomes, reflecting active protein synthesis. They do not contain smooth ER or DNA.

77. Answer: (D) Oxidative phosphorylation takes place in outer mitochondrial membrane.

Oxidative phosphorylation is carried out by the electron transport chain and ATP synthase located in the inner mitochondrial membrane, not the outer membrane. The other statements are correct: glycolysis is cytosolic and needs a supply of NAD⁺, and TCA enzymes lie in the matrix (succinate dehydrogenase being bound to the inner membrane).

78. Answer: (D) Polytene chromosomes - Oocytes of amphibians

Polytene chromosomes occur in the salivary glands of insect larvae such as *Drosophila*; the giant chromosomes of amphibian oocytes are lampbrush chromosomes, which are diplotene bivalents. Submetacentric chromosomes look L-shaped and allosomes are the sex chromosomes, so those matches are correct.

79. Answer: (B) Thecodont, Diphyodont, Heterodont

Human teeth sit in sockets of the jaw bones (thecodont), appear in two sets, milk and permanent (diphyodont), and are of different types, incisors, canines, premolars and molars (heterodont). Pleurodont teeth attached to the side of the jaw and homodont teeth of one type are found in some lower vertebrates.

80. Answer: (C) Polysome

Several ribosomes translating the same mRNA together form a polysome (polyribosome), which makes many copies of the polypeptide at once. A nucleosome is a unit of DNA wound on a histone octamer, and a plastidome is the total plastid content of a cell.

81. Answer: (C) Elephantiasis

Filariasis (elephantiasis) is caused by *Wuchereria bancrofti*, transmitted by the bite of female *Culex* mosquitoes; the worms live in lymphatic vessels and cause chronic inflammation and swelling of the limbs and genital organs. Ringworm is a fungal skin infection, and ascariasis and amoebiasis spread through contaminated food and water.

82. Answer: (A) Alzheimer's disease

Alzheimer's disease is a neurodegenerative disorder linked to loss of cholinergic neurons and amyloid plaques, not an attack by the immune system on self tissue. Rheumatoid arthritis, psoriasis and vitiligo are autoimmune disorders.

83. Answer: (D) Eye of octopus, bat and man

The eyes of octopus (a mollusc) and of mammals have similar function but different origin, so they are analogous organs produced by convergent evolution. The brain, heart and forelimbs of bat, man and cheetah share a common mammalian origin and are homologous, showing divergent evolution.

84. Answer: (A) Vitamin B₁₂

Lactic acid bacteria such as *Lactobacillus* that turn milk into curd also increase its vitamin B₁₂ content, which NCERT notes as the nutritional improvement. They do not synthesise the fat-soluble vitamins A, D or E.

85. Answer: (C) Homology

Forelimbs of whales, bats, cheetahs and humans have the same basic pattern of bones (humerus, radius-ulna, carpals, metacarpals, phalanges) though they do different jobs, which shows common ancestry: these are homologous organs. Analogy and convergent evolution refer to similar function with different structure and origin.

86. Answer: (B) Dominance, Co-dominance and Multiple allele

ABO blood groups are controlled by one gene I with three alleles (multiple alleles); I^A and I^B are each dominant over i (dominance), and when together both are expressed (co-dominance). Blood group is not a polygenic trait and shows no incomplete dominance.

Questions as set in the AIPMT/NEET papers conducted by CBSE and NTA. Answers checked and explanations written by the RankUp team. RankUp is not affiliated with CBSE or NTA.