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NEET (UG) 2017 — Biology (Botany + Zoology)

Exam date: 7 May 2017 • Test Booklet Code: C • Questions 1–90 (90 questions, all compulsory) • +4 / –1

Questions as they appeared in NEET (UG) 2017 conducted by CBSE. Answers verified by competitorspoint.com. Explanations by competitorspoint.com.

Biology — Botany + Zoology (Q. 1–90, all compulsory; questions are mixed as in the original paper)

1. The final proof for DNA as the genetic material came from the experiments of

(1) Hargobind Khorana **(2)** Griffith
(3) Hershey and Chase **(4)** Avery, Mcleod and McCarty

2. Spliceosomes are not found in cells of

(1) Bacteria **(2)** Plants
(3) Fungi **(4)** Animals

3. The pivot joint between atlas and axis is a type of

(1) Saddle joint **(2)** Fibrous joint
(3) Cartilaginous joint **(4)** Synovial joint

4. The association of histone H1 with a nucleosome indicates:

(1) The DNA double helix is exposed
(2) Transcription is occurring
(3) DNA replication is occurring
(4) The DNA is condensed into a Chromatin Fibre

5. Which of the following is made up of dead cells?

(1) Phloem **(2)** Xylem parenchyma
(3) Collenchyma **(4)** Phellem

6. Select the correct route for the passage of sperms in male frogs :

(1) Testes → Vasa efferentia → Kidney → Bidder's canal → Urinogenital duct → Cloaca
(2) Testes → Bidder's canal → Kidney → Vasa efferentia → Urinogenital duct → Cloaca
(3) Testes → Vasa efferentia → Kidney → Seminal Vesicle → Urinogenital duct → Cloaca
(4) Testes → Vasa efferentia → Bidder's canal → Ureter → Cloaca

7. Adult human RBCs are enucleate. Which of the following statement(s) is/are most appropriate explanation for this feature?

(a). They do not need to reproduce
(b). They are somatic cells
(c). They do not metabolize
(d). All their internal space is available for oxygen transport

Options :

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

8. Homozygous purelines in cattle can be obtained by

(1) Mating of individuals of different species
(2) Mating of related individuals of same breed
(3) Mating of unrelated individuals of same breed
(4) Mating of individuals of different breed

9. A temporary endocrine gland in the human body is

(1) Corpus allatum **(2)** Pineal gland
(3) Corpus cardiacum **(4)** Corpus luteum

10. Viroids differ from viruses in having :

(1) RNA molecules without protein coat
(2) DNA molecules with protein coat
(3) DNA molecules without protein coat
(4) RNA molecules with protein coat

11. A decrease in blood pressure/volume will not cause the release of

(1) ADH **(2)** Renin
(3) Atrial Natriuretic Factor **(4)** Aldosterone

12. An example of colonial alga is

(1) Spirogyra **(2)** Chlorella
(3) Volvox **(4)** Ulothrix

13. The morphological nature of the edible part of coconut is

(1) Pericarp **(2)** Perisperm
(3) Cotyledon **(4)** Endosperm

14. Which of the following is correctly matched for the product produced by them?

(1) Saccharomyces cerevisiae : Ethanol
(2) Acetobacter aceti : Antibiotics
(3) Methanobacterium : Lactic acid
(4) Penicillium notatum : Acetic acid

15. Match the following sexually transmitted diseases (Column - I) with their causative agent (Column - II) and select the correct option.

Column - I		Column - II	
(a)	Gonorrhea	**(i)**	HIV
(b)	Syphilis	**(ii)**	Neisseria
(c)	Genital Warts	**(iii)**	Treponema
(d)	AIDS	**(iv)**	Human Papilloma virus

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

16. In case of poriferans the spongocoel is lined with flagellated cells called :

(1) Mesenchymal cells **(2)** Ostia
(3) Oscula **(4)** Choanocytes

17. Among the following characters, which one was not considered by Mendel in his experiments on pea?

(1) Pod – Inflated or Constricted
(2) Stem – Tall or Dwarf
(3) Trichomes – Glandular or non-glandular
(4) Seed – Green or Yellow

18. Identify the wrong statement in context of heartwood.

(1) It comprises dead elements with highly lignified walls
(2) Organic compounds are deposited in it
(3) It is highly durable
(4) It conducts water and minerals efficiently

19. During DNA replication, Okazaki fragments are used to elongate

(1) The lagging strand away from the replication fork
(2) The leading strand towards replication fork
(3) The lagging strand towards replication fork
(4) The leading strand away from replication fork

20. Mycorrhizae are the example of

(1) Mutualism **(2)** Fungistasis
(3) Amensalism **(4)** Antibiosis

21. Which of the following RNAs should be most abundant in animal cell?

(1) mi-RNA **(2)** r-RNA
(3) t-RNA **(4)** m-RNA

22. The process of separation and purification of expressed protein before marketing is called

(1) Postproduction processing **(2)** Upstream processing
(3) Downstream processing **(4)** Bioprocessing

23. Which among the following are the smallest living cells, known without a definite cell wall, pathogenic to plants as well as animals and can survive without oxygen?

(1) Nostoc **(2)** Bacillus
(3) Pseudomonas **(4)** Mycoplasma

24. Which of the following components provides sticky character to the bacterial cell?

(1) Glycocalyx **(2)** Cell wall
(3) Nuclear membrane **(4)** Plasma membrane

25. With reference to factors affecting the rate of photosynthesis, which of the following statements is not correct?

(1) Tomato is a greenhouse crop which can be grown in CO_2 - enriched atmosphere for higher yield
(2) Light saturation for CO_2 fixation occurs at 10% of full sunlight
(3) Increasing atmospheric CO_2 concentration upto 0.05% can enhance CO_2 fixation rate
(4) C_3 plants responds to higher temperatures with enhanced photosynthesis while C_4 plants have much lower temperature optimum

26. Which of the following options best represents the enzyme composition of pancreatic juice?

(1) Lipase, amylase, trypsinogen, procarboxy-peptidase
(2) Amylase, peptidase, trypsinogen, rennin
(3) Amylase, pepsin, trypsinogen, maltase
(4) Peptidase, amylase, pepsin, rennin

27. Which one of the following statements is correct, with reference to enzymes?

(1) Holoenzyme = Coenzyme + Cofactor
(2) Apoenzyme = Holoenzyme + Coenzyme
(3) Holoenzyme = Apoenzyme + Coenzyme
(4) Coenzyme = Apoenzyme + Holoenzyme

28. If there are 999 bases in an RNA that codes for a protein with 333 amino acids, and the base at position 901 is deleted such that the length of the RNA becomes 998 bases, how many codons will be altered?

(1) 333 **(2)** 1
(3) 11 **(4)** 33

29. Asymptote in a logistic growth curve is obtained when

(1) K < N
(2) The value of 'r' approaches zero
(3) K = N
(4) K > N

30. Select the mismatch :

(1) Equisetum – Homosporous
(2) Pinus – Dioecious
(3) Cycas – Dioecious
(4) Salvinia – Heterosporous

31. Anaphase promoting complex (APC) is a protein degradation machinery necessary for proper mitosis of animal cells. If APC is defective in a human cell, which of the following is expected to occur?

(1) Recombination of chromosome arms will occur
(2) Chromosomes will not condense
(3) Chromosomes will be fragmented
(4) Chromosomes will not segregate

32. Which ecosystem has the maximum biomass?

(1) Lake ecosystem
(2) Forest ecosystem
(3) Grassland ecosystem
(4) Pond ecosystem

33. Zygotic meiosis is characteristic of

(1) Chlamydomonas
(2) Marchantia
(3) Fucus
(4) Funaria

34. Hypersecretion of Growth Hormone in adults does not cause further increase in height, because

(1) Muscle fibres do not grow in size after birth
(2) Growth Hormone becomes inactive in adults
(3) Epiphyseal plates close after adolescence
(4) Bones lose their sensitivity to Growth Hormone in adults

35. Frog's heart when taken out of the body continues to beat for some time. Select the best option from the following statements

(a). Frog is a poikilotherm
(b). Frog does not have any coronary circulation
(c). Heart is "myogenic" in nature
(d). Heart is autoexcitable

Options :

(1) (c) & (d)
(2) Only (c)
(3) Only (d)
(4) (a) & (b)

36. Transplantation of tissues/organs fails often due to non-acceptance by the patient's body. Which type of immune-response is responsible for such rejections?

(1) Physiological immune response
(2) Autoimmune response
(3) Cell-mediated immune response
(4) Hormonal immune response

37. Thalassemia and sickle cell anemia are caused due to a problem in globin molecule synthesis. Select the correct statement.

(1) Sickle cell anemia is due to a quantitative problem of globin molecules
(2) Both are due to a qualitative defect in globin chain synthesis
(3) Both are due to a quantitative defect in globin chain synthesis
(4) Thalassemia is due to less synthesis of globin molecules

38. An important characteristic that Hemichordates share with Chordates is

(1) Pharynx without gill slits
(2) Absence of notochord
(3) Ventral tubular nerve cord
(4) Pharynx with gill slits

39. Double fertilization is exhibited by

(1) Angiosperms
(2) Gymnosperms
(3) Algae
(4) Fungi

40. Which of the following cell organelles is responsible for extracting energy from carbohydrates to form ATP?

(1) Mitochondrion
(2) Lysosome
(3) Ribosome
(4) Chloroplast

41. Lungs are made up of air-filled sacs the alveoli. They do not collapse even after forceful expiration, because of :

(1) Expiratory Reserve Volume
(2) Residual Volume
(3) Inspiratory Reserve Volume
(4) Tidal Volume

42. Which of the following are not polymeric?

(1) Lipids
(2) Nucleic acids
(3) Proteins
(4) Polysaccharides

43. Flowers which have single ovule in the ovary and are packed into inflorescence are usually pollinated by

(1) Bat
(2) Water
(3) Bee
(4) Wind

44. Life cycle of Ectocarpus and Fucus respectively are

(1) Haplodiplontic, Haplontic
(2) Haplontic, Diplontic
(3) Diplontic, Haplodiplontic
(4) Haplodiplontic, Diplontic

45. Presence of plants arranged into well defined vertical layers depending on their height can be seen best in :

(1) Temperate Forest
(2) Tropical Savannah
(3) Tropical Rain Forest
(4) Grassland

46. Phosphoenol pyruvate (PEP) is the primary CO_2 acceptor in :

(1) C_3 and C_4 plants
(2) C_3 plants
(3) C_4 plants
(4) C_2 plants

47. Good vision depends on adequate intake of carotene rich food. Select the best option from the following statements

(a). Vitamin A derivatives are formed from carotene
(b). The photopigments are embedded in the membrane discs of the inner segment
(c). Retinal is a derivative of vitamin A
(d). Retinal is a light absorbing part of all the visual photopigments

Options :

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

48. Which one from those given below is the period for Mendel's hybridization experiments?

(1) 1870 - 1877
(2) 1856 - 1863
(3) 1840 - 1850
(4) 1857 - 1869

49. Select the mismatch :

(1) Rhizobium – Alfalfa
(2) Frankia – Alnus
(3) Rhodospirillum – Mycorrhiza
(4) Anabaena – Nitrogen fixer

50. Attractants and rewards are required for

(1) Cleistogamy
(2) Anemophily
(3) Entomophily
(4) Hydrophily

51. In case of a couple where the male is having a very low sperm count, which technique will be suitable for fertilisation?

(1) Intracytoplasmic sperm injection
(2) Intrauterine transfer
(3) Gamete intracytoplasmic fallopian transfer
(4) Artificial Insemination

52. Which among these is the correct combination of aquatic mammals?

(1) Trygon, Whales, Seals
(2) Seals, Dolphins, Sharks
(3) Dolphins, Seals, Trygon
(4) Whales, Dolphins, Seals

53. Functional megaspore in an angiosperm develops into

(1) Embryo
(2) Ovule
(3) Endosperm
(4) Embryo sac

54. Root hairs develop from the region of

(1) Meristematic activity
(2) Maturation
(3) Elongation
(4) Root cap

55. A dioecious flowering plant prevents both:

(1) Cleistogamy and xenogamy
(2) Autogamy and xenogamy
(3) Autogamy and geitonogamy
(4) Geitonogamy and xenogamy

56. The hepatic portal vein drains blood to liver from

(1) Intestine
(2) Heart
(3) Stomach
(4) Kidneys

57. What is the criterion for DNA fragments movement on agarose gel during gel electrophoresis?

(1) Negatively charged fragments do not move
(2) The larger the fragment size, the farther it moves
(3) The smaller the fragment size, the farther it moves
(4) Positively charged fragments move to farther end

58. Which of the following represents order of 'Horse'?

(1) Ferus
(2) Equidae
(3) Perissodactyla
(4) Caballus

59. Which statement is wrong for Krebs' cycle?

(1) The cycle starts with condensation of acetyl group (acetyl CoA) with pyruvic acid to yield citric acid
(2) There are three points in the cycle where NAD^+ is reduced to NADH + H^+
(3) There is one point in the cycle where FAD^+ is reduced to $FADH_2$
(4) During conversion of succinyl CoA to succinic acid, a molecule of GTP is synthesised

60. Artificial selection to obtain cows yielding higher milk output represents

(1) Stabilizing followed by disruptive as it stabilizes the population to produce higher yielding cows
(2) Stabilizing selection as it stabilizes this character in the population
(3) Directional as it pushes the mean of the character in one direction
(4) Disruptive as it splits the population into two one yielding higher output and the other lower output

61. The region of Biosphere Reserve which is legally protected and where no human activity is allowed is known as

(1) Restoration zone **(2)** Core zone
(3) Buffer zone **(4)** Transition zone

62. Receptor sites for neurotransmitters are present on

(1) Post-synaptic membrane
(2) Membranes of synaptic vesicles
(3) Pre-synaptic membrane
(4) Tips of axons

63. The vascular cambium normally gives rise to

(1) Periderm **(2)** Phelloderm
(3) Primary phloem **(4)** Secondary xylem

64. A baby boy aged two years is admitted to play school and passes through a dental check-up. The dentist observed that the boy had twenty teeth. Which teeth were absent?

(1) Molars **(2)** Incisors
(3) Canines **(4)** Pre-molars

65. The water potential of pure water is

(1) More than one
(2) Zero
(3) Less than zero
(4) More than zero but less than one

66. DNA fragments are

(1) Either positively or negatively charged depending on their size
(2) Positively charged
(3) Negatively charged
(4) Neutral

67. Capacitation occurs in

(1) Female Reproductive tract **(2)** Rete testis
(3) Epididymis **(4)** Vas deferens

68. The function of copper ions in copper releasing IUD's is :

(1) They inhibit ovulation
(2) They suppress sperm motility and fertilising capacity of sperms
(3) They inhibit gametogenesis
(4) They make uterus unsuitable for implantation

69. A gene whose expression helps to identify transformed cell is known as

(1) Structural gene **(2)** Selectable marker
(3) Vector **(4)** Plasmid

70. Which one of the following statements is not valid for aerosols?

(1) They have negative impact on agricultural land
(2) They are harmful to human health
(3) They alter rainfall and monsoon patterns
(4) They cause increased agricultural productivity

71. Which of the following statements is correct?

(1) The descending limb of loop of Henle is permeable to electrolytes
(2) The ascending limb of loop of Henle is impermeable to water
(3) The descending limb of loop of Henle is impermeable to water
(4) The ascending limb of loop of Henle is permeable to water

72. Which of the following in sewage treatment removes suspended solids?

(1) Sludge treatment **(2)** Tertiary treatment
(3) Secondary treatment **(4)** Primary treatment

73. GnRH, a hypothalamic hormone, needed in reproduction, acts on

(1) Posterior pituitary gland and stimulates secretion of LH and relaxin
(2) Anterior pituitary gland and stimulates secretion of LH and oxytocin
(3) Anterior pituitary gland and stimulates secretion of LH and FSH
(4) Posterior pituitary gland and stimulates secretion of oxytocin and FSH

74. Which of the following facilitates opening of stomatal aperture?

(1) Longitudinal orientation of cellulose microfibrils in the cell wall of guard cells
(2) Contraction of outer wall of guard cells
(3) Decrease in turgidity of guard cells
(4) Radial orientation of cellulose microfibrils in the cell wall of guard cells

75. The genotypes of a Husband and Wife are I^AI^B and I^Ai. Among the blood types of their children, how many different genotypes and phenotypes are possible?

(1) 4 genotypes ; 4 phenotypes
(2) 3 genotypes ; 3 phenotypes
(3) 3 genotypes ; 4 phenotypes
(4) 4 genotypes ; 3 phenotypes

76. Plants which produce characteristic pneumatophores and show vivipary belong to

(1) Hydrophytes
(2) Mesophytes
(3) Halophytes
(4) Psammophytes

77. Alexander Von Humboldt described for the first time

(1) Population Growth equation
(2) Ecological Biodiversity
(3) Laws of limiting factor
(4) Species area relationships

78. DNA replication in bacteria occurs

(1) Just before transcription
(2) During S-phase
(3) Within nucleolus
(4) Prior to fission

79. MALT constitutes about _____ percent of the lymphoid tissue in human body

(1) 10%
(2) 50%
(3) 20%
(4) 70%

80. In Bougainvillea thorns are the modifications of

(1) Leaf
(2) Stipules
(3) Adventitious root
(4) Stem

81. Fruit and leaf drop at early stages can be prevented by the application of

(1) Gibberellic acid
(2) Cytokinins
(3) Ethylene
(4) Auxins

82. Which of the following are found in extreme saline conditions?

(1) Mycobacteria
(2) Archaebacteria
(3) Eubacteria
(4) Cyanobacteria

83. Coconut fruit is a

(1) Capsule
(2) Drupe
(3) Berry
(4) Nut

84. The DNA fragments separated on an agarose gel can be visualised after staining with

(1) Ethidium bromide
(2) Bromophenol blue
(3) Acetocarmine
(4) Aniline blue

85. Out of 'X' pairs of ribs in humans only 'Y' pairs are true ribs. Select the option that correctly represents values of X and Y and provides their explanation :

(1) X = 24, Y = 12 — True ribs are dorsally attached to vertebral column but are free on ventral side
(2) X = 12, Y = 7 — True ribs are attached dorsally to vertebral column and ventrally to the sternum
(3) X = 12, Y = 5 — True ribs are attached dorsally to vertebral column and sternum on the two ends
(4) X = 24, Y = 7 — True ribs are dorsally attached to vertebral column but are free on ventral side

86. Myelin sheath is produced by

(1) Osteoclasts and Astrocytes
(2) Schwann Cells and Oligodendrocytes
(3) Astrocytes and Schwann Cells
(4) Oligodendrocytes and Osteoclasts

87. Which of the following options gives the correct sequence of events during mitosis?

(1) Condensation → arrangement at equator → centromere division → segregation → telophase
(2) Condensation → nuclear membrane disassembly → crossing over → segregation → telophase
(3) Condensation → nuclear membrane disassembly → arrangement at equator → centromere division → segregation → telophase
(4) Condensation → crossing over → nuclear membrane disassembly → segregation → telophase

88. A disease caused by an autosomal primary non-disjunction is

(1) Sickle cell anemia
(2) Down's syndrome
(3) Klinefelter's syndrome
(4) Turner's syndrome

89. Which cells of 'Crypts of Lieberkuhn' secrete antibacterial lysozyme?

(1) Kupffer cells
(2) Argentaffin cells
(3) Paneth cells
(4) Zymogen cells

90. Which one of the following is related to Ex-situ conservation of threatened animals and plants?

(1) Himalayan region
(2) Wildlife Safari parks
(3) Biodiversity hot spots
(4) Amazon rainforest

Answer key & explanations

Questions as they appeared in NEET (UG) 2017 conducted by CBSE. Answers verified by competitorspoint.com. Explanations by competitorspoint.com. Answer key: CBSE published its 2017 (revised) keys only on cbseneet.nic.in, which is no longer available, and no reliable mirror for code C was found; answers are the printed answers, independently checked against NCERT by competitorspoint.com.

1 – 3	**2** – 1	**3** – 4	**4** – 4	**5** – 4	**6** – 1	**7** – 2	**8** – 2	**9** – 4	**10** – 1
11 – 3	**12** – 3	**13** – 4	**14** – 1	**15** – 2	**16** – 4	**17** – 3	**18** – 4	**19** – 1	**20** – 1
21 – 2	**22** – 3	**23** – 4	**24** – 1	**25** – 4	**26** – 1	**27** – 3	**28** – 4	**29** – 3	**30** – 2
31 – 4	**32** – 2	**33** – 1	**34** – 3	**35** – 1	**36** – 3	**37** – 4	**38** – 4	**39** – 1	**40** – 1
41 – 2	**42** – 1	**43** – 4	**44** – 4	**45** – 3	**46** – 3	**47** – 3	**48** – 2	**49** – 3	**50** – 3
51 – 4	**52** – 4	**53** – 4	**54** – 2	**55** – 3	**56** – 1	**57** – 3	**58** – 3	**59** – 1	**60** – 3
61 – 2	**62** – 1	**63** – 4	**64** – 4	**65** – 2	**66** – 3	**67** – 1	**68** – 2	**69** – 2	**70** – 4
71 – 2	**72** – 4	**73** – 3	**74** – 4	**75** – 4	**76** – 3	**77** – 4	**78** – 4	**79** – 2	**80** – 4
81 – 4	**82** – 2	**83** – 2	**84** – 1	**85** – 2	**86** – 2	**87** – 3	**88** – 2	**89** – 3	**90** – 2

1. **Ans (3)** Hershey and Chase (1952) used radioactive phages to give unequivocal proof that DNA is the genetic material.

2. **Ans (1)** Bacterial genes have no introns, so prokaryotes lack spliceosomes.

3. **Ans (4)** The atlas–axis pivot joint is a synovial joint.

4. **Ans (4)** Histone H1 binds linker DNA and packs nucleosomes into the condensed chromatin fibre.

5. **Ans (4)** Phellem (cork) cells are dead and suberized at maturity.

6. **Ans (1)** In male frogs, sperms pass testes → vasa efferentia → kidney → Bidder's canal → urinogenital duct → cloaca.

7. **Ans (2)** Lack of a nucleus gives RBCs more internal space for haemoglobin and O_2 transport.

8. **Ans (2)** Inbreeding (mating of related individuals of the same breed) produces homozygous purelines.

9. **Ans (4)** The corpus luteum forms after ovulation and degenerates if there is no pregnancy, so it is a temporary endocrine gland.

10. **Ans (1)** Viroids are free RNA without a protein coat.

11. **Ans (3)** ANF is released when blood pressure or volume rises; a fall triggers ADH, renin and aldosterone.

12. **Ans (3)** Volvox is a colonial green alga.

13. **Ans (4)** The edible white kernel and coconut water are endosperm.

14. **Ans (1)** Saccharomyces cerevisiae (brewer's yeast) produces ethanol.

15. **Ans (2)** Gonorrhea – Neisseria; syphilis – Treponema; genital warts – HPV; AIDS – HIV.

16. **Ans (4)** The spongocoel is lined by flagellated choanocytes (collar cells).

17. **Ans (3)** Mendel did not study trichome type; his traits included pod shape, stem height and seed colour.

18. **Ans (4)** Heartwood is non-conducting; sapwood conducts water.

19. **Ans (1)** The lagging strand is synthesized discontinuously as Okazaki fragments, away from the fork.

20. **Ans (1)** Mycorrhiza is a mutualistic fungus–root association.

21. **Ans (2)** rRNA is the most abundant RNA (about 80%) in cells.

22. **Ans (3)** Separation and purification of products is downstream processing.

23. **Ans (4)** Mycoplasma are the smallest cells, wall-less, can live without O_2 and are pathogenic.

24. **Ans (1)** The glycocalyx (slime layer or capsule) makes bacterial cells sticky.

25. **Ans (4)** C_4 plants have higher temperature optima than C_3 plants, so statement (4) is wrong.

26. **Ans (1)** Pancreatic juice has lipase, amylase, trypsinogen and procarboxypeptidase.

27. **Ans (3)** Holoenzyme = apoenzyme + coenzyme (cofactor).

28. **Ans (4)** Deleting base 901 shifts codons 301–333, altering 33 codons.

29. **Ans (3)** Growth levels off (asymptote) when N reaches the carrying capacity K.

30. **Ans (2)** Pinus is monoecious.

31. **Ans (4)** APC degrades securin, allowing sister chromatids to separate; without it chromosomes fail to segregate.

32. **Ans (2)** Forests have the maximum biomass.

33. **Ans (1)** Chlamydomonas shows zygotic meiosis (haplontic life cycle).

34. **Ans (3)** After adolescence the epiphyseal plates fuse, so excess GH causes acromegaly, not more height.

35. **Ans (1)** The frog heart is myogenic and auto-excitable, so it beats outside the body.

36. **Ans (3)** Graft rejection is mediated by T cells (cell-mediated immunity).

37. **Ans (4)** Thalassemia is a quantitative defect (less globin); sickle-cell anaemia is qualitative.

38. **Ans (4)** Hemichordates share pharyngeal gill slits with chordates.

39. **Ans (1)** Double fertilization is unique to angiosperms.

40. **Ans (1)** Mitochondria oxidize carbohydrates to form ATP.

41. **Ans (2)** The residual volume keeps the alveoli from collapsing.

42. **Ans (1)** Lipids are not true polymers.

43. **Ans (4)** Flowers with a single ovule packed in an inflorescence (e.g., grasses, corn cob) are wind-pollinated.

44. **Ans (4)** Ectocarpus is haplo-diplontic; Fucus is diplontic.

45. **Ans (3)** Tropical rain forests show the most distinct vertical stratification.

46. **Ans (3)** PEP is the primary CO_2 acceptor in C_4 plants.

47. **Ans (3)** Carotene → vitamin A → retinal, the light-absorbing part of photopigments; photopigments are in the outer segment.

48. **Ans (2)** Mendel carried out his hybridization experiments in 1856–1863.

49. **Ans (3)** Rhodospirillum is a free-living N_2-fixing bacterium, not a mycorrhiza.

50. **Ans (3)** Insect-pollinated flowers offer attractants and rewards (nectar, pollen).

51. **Ans (4)** For low sperm count, NCERT recommends artificial insemination (AI/IUI).

52. **Ans (4)** Whales, dolphins and seals are aquatic mammals; Trygon and sharks are fishes.

53. **Ans (4)** The functional megaspore forms the female gametophyte (embryo sac).

54. **Ans (2)** Root hairs arise in the zone of maturation.

55. **Ans (3)** Dioecy prevents both autogamy and geitonogamy.

56. **Ans (1)** The hepatic portal vein carries blood from the intestine to the liver.

57. **Ans (3)** Smaller DNA fragments move farther through the agarose gel.

58. **Ans (3)** Horse belongs to the order Perissodactyla.

59. **Ans (1)** The Krebs cycle starts with acetyl CoA condensing with oxaloacetic acid, not pyruvic acid.

60. **Ans (3)** Selecting for higher milk yield shifts the mean in one direction: directional selection.

61. **Ans (2)** The core zone is legally protected and has no human activity.

62. **Ans (1)** Neurotransmitter receptors are on the post-synaptic membrane.

63. **Ans (4)** Vascular cambium forms secondary xylem and phloem.

64. **Ans (4)** Milk teeth (20) lack premolars.

65. **Ans (2)** The water potential of pure water is zero.

66. **Ans (3)** DNA is negatively charged (phosphate groups).

67. **Ans (1)** Capacitation of sperms occurs in the female reproductive tract.

68. **Ans (2)** Cu^{2+} ions suppress sperm motility and fertilizing capacity.

69. **Ans (2)** A selectable marker identifies transformed cells.

70. **Ans (4)** Aerosols reduce, not increase, agricultural productivity.

71. **Ans (2)** The ascending limb of Henle's loop is impermeable to water.

72. **Ans (4)** Primary treatment removes floating and suspended solids by filtration and sedimentation.

73. **Ans (3)** GnRH acts on the anterior pituitary to release LH and FSH.

74. **Ans (4)** Radially arranged cellulose microfibrils in guard cells help them bow and open the pore.

75. **Ans (4)** $I^AI^B \times I^Ai$ gives I^AI^A, I^Ai, I^AI^B, I^Bi: 4 genotypes and 3 phenotypes (A, AB, B).

76. **Ans (3)** Mangroves (halophytes) show pneumatophores and vivipary.

77. **Ans (4)** Humboldt described the species–area relationship.

78. **Ans (4)** Bacteria replicate DNA before fission (no S-phase in the eukaryotic sense).

79. **Ans (2)** MALT forms about 50% of lymphoid tissue.

80. **Ans (4)** Bougainvillea thorns are modified axillary shoots (stem).

81. **Ans (4)** Auxins prevent premature fruit and leaf drop.

82. **Ans (2)** Halophilic archaebacteria live in extreme salt.

83. **Ans (2)** Coconut is a drupe (fibrous mesocarp).

84. **Ans (1)** DNA is stained with ethidium bromide and viewed under UV light.

85. **Ans (2)** Humans have 12 rib pairs; the first 7 true pairs attach dorsally to the vertebrae and ventrally to the sternum.

86. **Ans (2)** Schwann cells (PNS) and oligodendrocytes (CNS) form myelin.

87. **Ans (3)** Mitosis: condensation → nuclear membrane breakdown → metaphase alignment → centromere split → segregation → telophase.

88. **Ans (2)** Down's syndrome (trisomy 21) is due to autosomal non-disjunction.

89. **Ans (3)** Paneth cells secrete lysozyme.

90. **Ans (2)** Wildlife safari parks are ex situ conservation.