

NEET 2017 — Biology Question Paper with Solutions

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

NEET 2017 · Q46

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

- (A) Tertiary treatment
- (B) Secondary treatment
- (C) Primary treatment
- (D) Sludge treatment

NEET 2017 · Q47

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

- (A) Wildlife Safari parks
- (B) Biodiversity hot spots
- (C) Amazon rainforest
- (D) Himalayan region

NEET 2017 · Q48

3. Phosphoenol pyruvate (PEP) is the primary CO₂ acceptor in:

- (A) C₃ plants
- (B) C₄ plants
- (C) C₂ plants
- (D) C₃ and C₄ plants

NEET 2017 · Q49

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

- (A) They are harmful to human health
- (B) They alter rainfall and monsoon patterns
- (C) They cause increased agricultural productivity
- (D) They have negative impact on agricultural land

NEET 2017 · Q50

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

- (A) ostia
- (B) oscula
- (C) choanocytes
- (D) mesenchymal cells

NEET 2017 · Q51

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

- (A) Argentaffin cells
- (B) Paneth cells
- (C) Zymogen cells
- (D) Kupffer cells

NEET 2017 · Q52

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

- (A) Residual Volume
- (B) Inspiratory Reserve Volume
- (C) Tidal Volume
- (D) Expiratory Reserve Volume

NEET 2017 · Q53

8. Viroids differ from viruses in having:

- (A) DNA molecules with protein coat
- (B) DNA molecules without protein coat
- (C) RNA molecules with protein coat
- (D) RNA molecules without protein coat

NEET 2017 · Q54

9. Which of the following are not polymeric?

- (A) Nucleic acids
- (B) Proteins
- (C) Polysaccharides
- (D) Lipids

NEET 2017 · Q55

10. Select the mismatch:

- (A) Pinus - Dioecious
- (B) Cycas - Dioecious
- (C) Salvinia - Heterosporous
- (D) Equisetum - Homosporous

NEET 2017 · Q56

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

- (A) Selectable marker
- (B) Vector
- (C) Plasmid
- (D) Structural gene

NEET 2017 · Q57

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

- (A) Renin
- (B) Atrial Natriuretic Factor
- (C) Aldosterone
- (D) ADH

NEET 2017 · Q58

13. In Bougainvillea thorns are the modifications of:

- (A) Stipules
- (B) Adventitious root
- (C) Stem
- (D) Leaf

NEET 2017 · Q59

14. An important characteristic that Hemichordates share with Chordates is:

- (A) absence of notochord
- (B) ventral tubular nerve cord
- (C) pharynx with gill slits
- (D) pharynx without gill slits

NEET 2017 · Q60

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

- (A) Contraction of outer wall of guard cells
- (B) Decrease in turgidity of guard cells
- (C) Radial orientation of cellulose microfibrils in the cell wall of guard cells
- (D) Longitudinal orientation of cellulose microfibrils in the cell wall of guard cells

NEET 2017 · Q61

16. Which of the following statements is correct?

- (A) The ascending limb of loop of Henle is impermeable to water.
- (B) The descending limb of loop of Henle is impermeable to water.
- (C) The ascending limb of loop of Henle is permeable to water.
- (D) The descending limb of loop of Henle is permeable to electrolytes.

NEET 2017 · Q62

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

- (A) Archaeobacteria
- (B) Eubacteria
- (C) Cyanobacteria
- (D) Mycobacteria

NEET 2017 · Q63

18. The morphological nature of the edible part of coconut is:

- (A) Perisperm
- (B) Cotyledon
- (C) Endosperm
- (D) Pericarp

NEET 2017 · Q64

19. Identify the wrong statement in context of heartwood:

- (A) Organic compounds are deposited in it
- (B) It is highly durable
- (C) It conducts water and minerals efficiently
- (D) It comprises dead elements with highly lignified walls

NEET 2017 · Q65

20. 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?

- (A) 1
- (B) 11
- (C) 33
- (D) 333

NEET 2017 · Q67

21. A dioecious flowering plant prevents both:

- (A) Autogamy and xenogamy
- (B) Autogamy and geitonogamy
- (C) Geitonogamy and xenogamy
- (D) Cleistogamy and xenogamy

NEET 2017 · Q68

22. Which statement is wrong for Krebs' cycle?

- (A) There are three points in the cycle where NAD^+ is reduced to $\text{NADH} + \text{H}^+$
- (B) There is one point in the cycle where FAD^+ is reduced to FADH_2
- (C) During conversion of succinyl CoA to succinic acid, a molecule of GTP is synthesised
- (D) The cycle starts with condensation of acetyl group (acetyl CoA) with pyruvic acid to yield citric acid

NEET 2017 · Q69

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

- (A) Seals, Dolphins, Sharks
- (B) Dolphins, Seals, Trygon
- (C) Whales, Dolphins, Seals
- (D) Trygon, Whales, Seals

NEET 2017 · Q70

24. The hepatic portal vein drains blood to liver from:

- (A) Heart
- (B) Stomach
- (C) Kidneys
- (D) Intestine

NEET 2017 · Q71

25. Functional megaspore in an angiosperm develops into:

- (A) Ovule
- (B) Endosperm
- (C) Embryo sac
- (D) Embryo

NEET 2017 · Q72

26. Mycorrhizae are the example of:

- (A) Fungistasis
- (B) Amensalism
- (C) Antibiosis
- (D) Mutualism

NEET 2017 · Q73

27. 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?

- (A) Autoimmune response
- (B) Cell - mediated immune response
- (C) Hormonal immune response
- (D) Physiological immune response

NEET 2017 · Q74

28. 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**

- (A) Only (d)
- (B) Only (a)
- (C) (a), (c) and (d)
- (D) (b) and (c)

NEET 2017 · Q75

29. Alexander Von Humbolt described for the first time:

- (A) Ecological Biodiversity
- (B) Laws of limiting factor
- (C) Species area relationships
- (D) Population Growth equation

NEET 2017 · Q76

30. Attractants and rewards are required for:

- (A) Anemophily
- (B) Entomophily
- (C) Hydrophily
- (D) Cleistogamy

NEET 2017 · Q78

31. An example of colonial alga is:

- (A) Chlorella
- (B) Volvox
- (C) Ulothrix
- (D) Spirogyra

NEET 2017 · Q80

32. DNA fragments are:

- (A) Positively charged
- (B) Negatively charged
- (C) Neutral
- (D) Either positively or negatively charged depending on their size

NEET 2017 · Q81

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

- (A) fibrous joint
- (B) cartilaginous joint
- (C) synovial joint
- (D) saddle joint

NEET 2017 · Q82

34. Asymptote in a logistic growth curve is obtained when:

- (A) The value of 'r' approaches zero
- (B) $K = N$
- (C) $K > N$
- (D) $K < N$

NEET 2017 · Q83

35. Myelin sheath is produced by:

- (A) Schwann Cells and Oligodendrocytes
- (B) Astrocytes and Schwann Cells
- (C) Oligodendrocytes and Osteoclasts
- (D) Osteoclasts and Astrocytes

NEET 2017 · Q84

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

- (A) Upstream processing
- (B) Downstream processing
- (C) Bioprocessing
- (D) Postproduction processing

NEET 2017 · Q85

37. GnRH, a hypothalamic hormone, needed in reproduction, acts on:

- (A) anterior pituitary gland and stimulates secretion of LH and oxytocin.
- (B) anterior pituitary gland and stimulates secretion of LH and FSH.
- (C) posterior pituitary gland and stimulates secretion of oxytocin and FSH.
- (D) posterior pituitary gland and stimulates secretion of LH and relaxin.

NEET 2017 · Q86

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

- (A) Growth Hormone becomes inactive in adults.
- (B) Epiphyseal plates close after adolescence.
- (C) Bones lose their sensitivity to Growth Hormone in adults.
- (D) Muscle fibres do not grow in size after birth.

NEET 2017 · Q87

39. Which ecosystem has the maximum biomass?

- (A) Forest ecosystem
- (B) Grassland ecosystem
- (C) Pond ecosystem
- (D) Lake ecosystem

NEET 2017 · Q88

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

- (A) Cytokinins
- (B) Ethylene
- (C) Auxins
- (D) Gibberellic acid

NEET 2017 · Q93

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

- (A) Both are due to a qualitative defect in globin chain synthesis.
- (B) Both are due to a quantitative defect in globin chain synthesis.
- (C) Thalassemia is due to less synthesis of globin molecules.
- (D) Sickle cell anemia is due to a quantitative problem of globin molecules.

NEET 2017 · Q94

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

- (A) Xylem parenchyma
- (B) Collenchyma
- (C) Phellem
- (D) Phloem

NEET 2017 · Q95

43. 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?

- (A) Incisors
- (B) Canines
- (C) Pre-molars
- (D) Molars

NEET 2017 · Q96

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

- (A) Lysosome
- (B) Ribosome
- (C) Chloroplast
- (D) Mitochondrion

NEET 2017 · Q97

45. Capacitation occurs in:

- (A) Rete testis
- (B) Epididymis
- (C) Vas deferens
- (D) Female Reproductive tract

NEET 2017 · Q102

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

- (A) Testes → Bidder's canal → Kidney → Vasa efferentia → Urinogenital duct → Cloaca
- (B) Testes → Vasa efferentia → Kidney → Seminal Vesicle → Urinogenital duct → Cloaca
- (C) Testes → Vasa efferentia → Bidder's canal → Ureter → Cloaca
- (D) Testes → Vasa efferentia → Kidney → Bidder's canal → Urinogenital duct → Cloaca

NEET 2017 · Q103

47. Spliceosomes are not found in cells of:

- (A) Plants
- (B) Fungi
- (C) Animals
- (D) Bacteria

NEET 2017 · Q104

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

- (A) 1856 - 1863
- (B) 1840 - 1850
- (C) 1857 - 1869
- (D) 1870 - 1877

NEET 2017 · Q105

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

- (A) Bromophenol blue
- (B) Acetocarmine
- (C) Aniline blue
- (D) Ethidium bromide

NEET 2017 · Q106

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

- (A) They suppress sperm motility and fertilising capacity of sperms.
- (B) They inhibit gametogenesis.
- (C) They make uterus unsuitable for implantation.
- (D) They inhibit ovulation.

NEET 2017 · Q107

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

- (A) Tropical Savannah
- (B) Tropical Rain Forest
- (C) Grassland
- (D) Temperate Forest

NEET 2017 · Q110

52. Zygotic meiosis is characteristic of:

- (A) Marchantia
- (B) Fucus
- (C) Funaria
- (D) Chlamydomonas

NEET 2017 · Q111

53. Life cycle of Ectocarpus and Fucus respectively are:

- (A) Haplontic, Diplontic
- (B) Diplontic, Haplodiplontic
- (C) Haplodiplontic, Diplontic
- (D) Haplodiplontic, Haplontic

NEET 2017 · Q112

54. 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?

- (A) Bacillus
- (B) Pseudomonas
- (C) Mycoplasma
- (D) Nostoc

NEET 2017 · Q113

55. Root hairs develop from the region of:

- (A) Maturation
- (B) Elongation
- (C) Root cap
- (D) Meristematic activity

NEET 2017 · Q114

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

- (A) Water
- (B) Bee
- (C) Wind
- (D) Bat

NEET 2017 · Q115

57. Receptor sites for neurotransmitters are present on:

- (A) membranes of synaptic vesicles
- (B) pre-synaptic membrane
- (C) tips of axons
- (D) post-synaptic membrane

NEET 2017 · Q116

58. Plants which produce characteristic pneumatophores and show vivipary belong to:

- (A) Mesophytes
- (B) Halophytes
- (C) Psammophytes
- (D) Hydrophytes

NEET 2017 · Q117

59. DNA replication in bacteria occurs:

- (A) During S phase
- (B) Within nucleolus
- (C) Prior to fission
- (D) Just before transcription

NEET 2017 · Q118

60. The genotypes of a Husband and Wife are $I^A I^B$ and $I^A i$. Among the blood types of their children, how many different genotypes and phenotypes are possible?

- (A) 3 genotypes ; 3 phenotypes
- (B) 3 genotypes ; 4 phenotypes
- (C) 4 genotypes ; 3 phenotypes
- (D) 4 genotypes ; 4 phenotypes

NEET 2017 · Q119

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

- (A) Cell wall
- (B) Nuclear membrane
- (C) Plasma membrane
- (D) Glycocalyx

NEET 2017 · Q120

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

- (A) r-RNA
- (B) t-RNA
- (C) m-RNA
- (D) mi-RNA

NEET 2017 · Q123

63. Select the mismatch:

- (A) Frankia - Alnus
- (B) Rhodospirillum - Mycorrhiza
- (C) Anabaena - Nitrogen fixer
- (D) Rhizobium - Alfalfa

NEET 2017 · Q124

64. Double fertilization is exhibited by:

- (A) Gymnosperms
- (B) Algae
- (C) Fungi
- (D) Angiosperms

NEET 2017 · Q126

65. A temporary endocrine gland in the human body is:

- (A) Pineal gland
- (B) Corpus cardiacum
- (C) Corpus luteum
- (D) Corpus allatum

NEET 2017 · Q127

66. The vascular cambium normally gives rise to:

- (A) Phelloderm
- (B) Primary phloem
- (C) Secondary xylem
- (D) Periderm

NEET 2017 · Q128

67. During DNA replication, Okazaki fragments are used to elongate:

- (A) The leading strand towards replication fork.
- (B) The lagging strand towards replication fork.
- (C) The leading strand away from replication fork.
- (D) The lagging strand away from the replication fork.

NEET 2017 · Q129

68. Artificial selection to obtain cows yielding higher milk output represents:

- (A) stabilizing selection as it stabilizes this character in the population.
- (B) directional as it pushes the mean of the character in one direction.
- (C) disruptive as it splits the population into two, one yielding higher output and the other lower output.
- (D) stabilizing followed by disruptive as it stabilizes the population to produce higher yielding cows.

NEET 2017 · Q130

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

- (A) amylase, peptidase, trypsinogen, rennin
- (B) amylase, pepsin, trypsinogen, maltase
- (C) peptidase, amylase, pepsin, rennin
- (D) lipase, amylase, trypsinogen, procarboxypeptidase

70. Coconut fruit is a:

- (A) Drupe
- (B) Berry
- (C) Nut
- (D) Capsule

71. The water potential of pure water is:

- (A) Zero
- (B) Less than zero
- (C) More than zero but less than one
- (D) More than one

72. MALT constitutes about ____ percent of the lymphoid tissue in human body.

- (A) 50%
- (B) 20%
- (C) 70%
- (D) 10%

Answer key and explanations

1. Answer: (C) Primary treatment

Primary treatment is the physical stage: floating debris is removed by sequential filtration and grit and suspended solids settle out by sedimentation as primary sludge. Secondary treatment is biological and removes dissolved organic matter (BOD) through microbes, not suspended solids.

2. Answer: (A) Wildlife Safari parks

Ex-situ conservation protects threatened species outside their natural habitat, in places such as zoos, botanical gardens and wildlife safari parks. Biodiversity hotspots, the Amazon rainforest and the Himalayan region are natural habitats, so protecting them is in-situ conservation.

3. Answer: (B) C₄ plants

In C₄ plants PEP in mesophyll cells accepts CO₂ (catalysed by PEP carboxylase) to form the 4-carbon oxaloacetic acid. C₃ plants use RuBP as the primary CO₂ acceptor, so PEP is not the acceptor in both groups.

4. Answer: (C) They cause increased agricultural productivity

Aerosols (fine particles and droplets in air) harm human health, alter cloud formation, rainfall and monsoon patterns, and lower crop yields by cutting sunlight and depositing on land. They do not raise agricultural productivity, so that statement is the invalid one.

5. Answer: (C) choanocytes

The spongocoel and canals of sponges are lined by flagellated collar cells called choanocytes, which drive the water current. Ostia are the pores through which water enters and the osculum is the opening through which it leaves; they are openings, not cells.

6. Answer: (B) Paneth cells

Paneth cells at the base of the intestinal crypts of Lieberkühn secrete lysozyme, an antibacterial enzyme. Argentaffin cells are enteroendocrine cells, zymogen cells are found in gastric glands, and Kupffer cells are macrophages of the liver.

7. Answer: (A) Residual Volume

Residual volume (about 1100–1200 mL) is the air that remains in the lungs even after the most forceful expiration, and it keeps the alveoli from collapsing. Expiratory reserve volume is the extra air that can be breathed out forcibly, so it is exactly the air that is removed.

8. Answer: (D) RNA molecules without protein coat

Viroids, discovered by T.O. Diener as the cause of potato spindle tuber disease, are free low-molecular-weight RNA without any protein coat. Viruses always have a protein capsid around their nucleic acid, so a coated RNA describes a virus, not a viroid.

9. Answer: (D) Lipids

Lipids are small molecules (molecular weight below about 800 Da) built from fatty acids and glycerol, not repeating monomers, so they are not true polymers; they only appear in the acid-insoluble fraction because they form membrane vesicles. Nucleic acids, proteins and polysaccharides are polymers of nucleotides, amino acids and monosaccharides.

10. Answer: (A) Pinus - Dioecious

Pinus is monoecious, bearing both male and female cones on the same plant, so pairing it with dioecious is the mismatch. Cycas is truly dioecious, Salvinia is a heterosporous water fern and Equisetum is homosporous.

11. Answer: (A) Selectable marker

A selectable marker, such as a gene for ampicillin or tetracycline resistance, lets transformants be picked out because only they survive on the selective medium. A vector or plasmid is the carrier of the DNA, not the identifying gene.

12. Answer: (B) Atrial Natriuretic Factor

Atrial natriuretic factor is released by the atrial walls when blood pressure or volume rises, and it causes vasodilation to lower pressure. A fall in pressure or volume instead triggers renin (and through it aldosterone) and ADH, which raise it.

13. Answer: (C) Stem

Thorns of Bougainvillea arise from axillary buds, which marks them as modified stems. Spines of cacti are modified leaves, and stipules can also form spines, but neither applies to Bougainvillea.

14. Answer: (C) pharynx with gill slits

Hemichordates have pharyngeal gill slits, one of the basic chordate features. Chordates have a notochord and a dorsal (not ventral) hollow nerve cord, so the absence of a notochord and a ventral nerve cord are not shared features.

15. Answer: (C) Radial orientation of cellulose microfibrils in the cell wall of guard cells

Cellulose microfibrils in guard cell walls are oriented radially, so when the cells become turgid the outer walls bow out and the inner walls are pulled into a crescent, opening the pore. A loss of turgor closes the stoma.

16. Answer: (A) The ascending limb of loop of Henle is impermeable to water.

The ascending limb of Henle's loop is impermeable to water but transports electrolytes, which helps build the medullary concentration gradient. The descending limb is the opposite: permeable to water and almost impermeable to electrolytes.

17. Answer: (A) Archaeobacteria

Halophiles, a group of archaeobacteria, live in extremely salty habitats; their distinctive cell wall helps them survive such conditions. Eubacteria, cyanobacteria and mycobacteria are not characteristic of extreme salinity.

18. Answer: (C) Endosperm

The edible white kernel and the coconut water are the endosperm (cellular and free-nuclear respectively). The pericarp of the drupe forms the outer fibrous husk and hard shell, which is not eaten.

19. Answer: (C) It conducts water and minerals efficiently

Heartwood is the dark central wood whose dead, highly lignified elements are filled with tannins, resins, oils and gums, which make it durable but non-conducting. Water and minerals are conducted by the outer sapwood, so that statement is wrong.

20. Answer: (C) 33

Base 901 is the first base of codon 301 (bases 901-903). Deleting it shifts the reading frame from codon 301 to the end, so codons 301 to 333, that is $333 - 300 = 33$ codons, are altered while the first 300 stay the same. Choosing 333 wrongly assumes the whole message is misread.

21. Answer: (B) Autogamy and geitonogamy

In a dioecious plant male and female flowers are on different plants, so pollen cannot reach a stigma of the same flower (autogamy) or of another flower on the same plant (geitonogamy). Xenogamy, pollination between different plants, is the only route left, so it is not prevented.

22. Answer: (D) The cycle starts with condensation of acetyl group (acetyl CoA) with pyruvic acid to yield citric acid

The Krebs cycle begins when acetyl CoA condenses with oxaloacetic acid and water to form citric acid, not with pyruvic acid; pyruvate is converted to acetyl CoA before the cycle. The cycle does have three NAD⁺ reductions, one FAD reduction and substrate-level GTP formation from succinyl CoA.

23. Answer: (C) Whales, Dolphins, Seals

Whales, dolphins and seals are all aquatic mammals. Sharks and Trygon (sting ray) are cartilaginous fishes, so any group containing them is wrong.

24. Answer: (D) Intestine

The hepatic portal vein carries blood from the intestine to the liver before it reaches the systemic circulation, so absorbed nutrients are processed first. Blood from the heart reaches the liver through the hepatic artery, and kidneys drain into the renal veins.

25. Answer: (C) Embryo sac

The single functional megaspore undergoes three free-nuclear mitotic divisions to form the 7-celled, 8-nucleate embryo sac (female gametophyte). The ovule is the structure that contains it, and endosperm and embryo form only after fertilisation.

26. Answer: (D) Mutualism

In mycorrhiza the fungus absorbs mineral nutrients such as phosphorus for the plant, and the plant supplies the fungus with carbohydrates, so both partners benefit: mutualism. Amensalism harms one partner without affecting the other.

27. Answer: (B) Cell - mediated immune response

Graft rejection is caused by cell-mediated immunity, in which T-lymphocytes recognise the graft as non-self and attack it. An autoimmune response is directed against the body's own cells, not against a transplanted organ.

28. Answer: (A) Only (d)

Losing the nucleus leaves the whole biconcave cell free to be packed with haemoglobin, so it can carry the most oxygen. RBCs do metabolise (they run glycolysis), and being somatic or non-dividing does not explain why the nucleus is lost.

29. Answer: (C) Species area relationships

During his explorations of South America Alexander von Humboldt observed that species richness rises with the area explored, the species-area relationship ($\log S = \log C + Z \log A$). The law of limiting factors comes from Liebig and Blackman, not Humboldt.

30. Answer: (B) Entomophily

Insect-pollinated (entomophilous) flowers attract pollinators with colour, scent and nectar, and reward them with nectar and pollen. Wind and water pollination need no attractants, and cleistogamous flowers never open.

31. Answer: (B) Volvox

Volvox is a colonial green alga, a hollow sphere of many flagellated cells. Chlorella is unicellular, while Ulothrix and Spirogyra are filamentous.

32. Answer: (B) Negatively charged

The phosphate groups of the sugar-phosphate backbone carry negative charges, so all DNA fragments are negatively charged and move towards the anode in electrophoresis. Size changes how fast they move, not the sign of their charge.

33. Answer: (C) synovial joint

The joint between atlas and axis is a pivot joint, one kind of synovial joint with a fluid-filled cavity that allows rotation of the head. A saddle joint is a different synovial joint, found between the carpal and metacarpal of the thumb.

34. Answer: (B) $K = N$

In logistic growth $dN/dt = rN(K - N)/K$, so growth stops and the curve flattens into the asymptote when population density N reaches the carrying capacity K . The intrinsic rate r stays the same; it is the $(K - N)/K$ term that falls to zero.

35. Answer: (A) Schwann Cells and Oligodendrocytes

Myelin is formed by Schwann cells around axons in the peripheral nervous system and by oligodendrocytes in the central nervous system. Astrocytes support neurons but do not make myelin, and osteoclasts are bone-resorbing cells.

36. Answer: (B) Downstream processing

After biosynthesis in the bioreactor, the product is separated, purified, formulated with preservatives and put through quality control; these steps together are downstream processing. Upstream processing is the earlier stage of preparing the organism and growing it.

37. Answer: (B) anterior pituitary gland and stimulates secretion of LH and FSH.

Gonadotropin-releasing hormone from the hypothalamus acts on the anterior pituitary and stimulates release of the gonadotropins LH and FSH. Oxytocin is made in the hypothalamus and released from the posterior pituitary, and relaxin comes from the placenta and ovary.

38. Answer: (B) Epiphyseal plates close after adolescence.

Growth in length of long bones happens at the epiphyseal (growth) plates, which ossify and close after adolescence, so excess GH in adults cannot add height. It instead thickens bones of the face, hands and feet (acromegaly), showing the hormone is still active.

39. Answer: (A) Forest ecosystem

Forests hold by far the largest standing biomass because of their massive woody trees. Grasslands have small herbaceous producers, and ponds and lakes have tiny phytoplankton with low standing crop.

40. Answer: (C) Auxins

Auxins such as NAA prevent premature drop of fruits and leaves, while they promote abscission of older mature leaves and fruits. Ethylene does the opposite and promotes abscission.

41. Answer: (C) Thalassemia is due to less synthesis of globin molecules.

Thalassemia is a quantitative problem in which too few globin chains are made. Sickle cell anaemia is a qualitative problem, an abnormal β -globin with valine in place of glutamic acid, so calling it quantitative is wrong.

42. Answer: (C) Phellem

Phellem (cork) cells are dead at maturity, with suberin deposited in their walls. Xylem parenchyma, collenchyma and the sieve tubes and companion cells of phloem are living (phloem fibres are the only dead part of phloem).

43. Answer: (C) Pre-molars

The 20 milk (deciduous) teeth have the dental formula $2102/2102$, with no premolars; the 12 premolars appear only among the 32 permanent teeth. Incisors, canines and molars are all present in the milk set.

44. Answer: (D) Mitochondrion

Mitochondria are the sites of aerobic respiration, where the energy of carbohydrates is extracted and stored as ATP; they are called the powerhouses of the cell. Chloroplasts trap light energy to make carbohydrates rather than break them down.

45. Answer: (D) Female Reproductive tract

Capacitation, the final activation of sperms that makes them able to fertilise the ovum, happens in the female reproductive tract. Sperms mature and are stored in the epididymis, but that is not capacitation.

46. Answer: (D) Testes → Vasa efferentia → Kidney → Bidder's canal → Urinogenital duct → Cloaca

In male frogs the vasa efferentia leave the testes and enter the kidney, where they open into Bidder's canal, which joins the urinogenital duct (ureter) that opens into the cloaca. Routes that place Bidder's canal before the vasa efferentia or skip the kidney do not match frog anatomy.

47. Answer: (D) Bacteria

Spliceosomes remove introns from eukaryotic hnRNA. Bacterial genes are not split into exons and introns, so bacteria have no spliceosomes, while plants, fungi and animals, all eukaryotes, do.

48. Answer: (A) 1856 - 1863

Mendel carried out his hybridisation experiments on garden pea for seven years, from 1856 to 1863, and published them in 1865. The other ranges do not match this period.

49. Answer: (D) Ethidium bromide

DNA in the gel is stained with ethidium bromide and seen as bright orange bands under UV light. Bromophenol blue is only a tracking dye that shows how far the run has gone, and does not stain DNA bands.

50. Answer: (A) They suppress sperm motility and fertilising capacity of sperms.

Copper ions released by IUDs such as CuT suppress sperm motility and the fertilising capacity of sperms. Making the uterus unsuitable for implantation is the action of hormone-releasing IUDs, and stopping ovulation is the action of oral pills.

51. Answer: (B) Tropical Rain Forest

Vertical stratification, with emergent trees, canopy, understorey shrubs and ground herbs, is best developed in tropical rain forests. Grasslands and savannas have mostly herbaceous layers, and temperate forests have fewer layers.

52. Answer: (D) Chlamydomonas

Zygotic meiosis means the zygote is the only diploid stage and divides meiotically at once, the haplontic life cycle seen in *Chlamydomonas*. *Fucus* is diplontic (gametic meiosis), while *Marchantia* and *Funaria* are haplo-diplontic with sporic meiosis.

53. Answer: (C) Haplodiplontic, Diplontic

Ectocarpus is haplo-diplontic, with free-living multicellular haploid and diploid phases, while *Fucus* is diplontic, the gametes being the only haploid stage. Calling *Fucus* haplontic or haplo-diplontic is the trap.

54. Answer: (C) Mycoplasma

Mycoplasmas have no cell wall, are the smallest known living cells (about 0.3 μm), can survive without oxygen, and many cause diseases in plants and animals. *Bacillus*, *Pseudomonas* and *Nostoc* all have cell walls and are much larger.

55. Answer: (A) Maturation

Cells of the region of elongation gradually differentiate in the region of maturation, and some epidermal cells there form root hairs. The region of elongation is mainly responsible for growth in length, and the root cap only protects the tip.

56. Answer: (C) Wind

Wind-pollinated flowers often have a single ovule in each ovary and many flowers packed into an inflorescence, as in corn cobs and grasses. Bee- and bat-pollinated flowers rely on showy flowers, scent and nectar instead.

57. Answer: (D) post-synaptic membrane

Neurotransmitters released into the synaptic cleft bind to specific receptors on the post-synaptic membrane, opening ion channels there. The synaptic vesicles and pre-synaptic axon terminal store and release the transmitter but do not carry its receptors.

58. Answer: (B) Halophytes

Mangroves such as *Rhizophora* are halophytes of salty swamps; they bear negatively geotropic breathing roots (pneumatophores) and show vivipary, seeds germinating on the parent plant. Hydrophytes are freshwater plants and psammophytes grow on sand.

59. Answer: (C) Prior to fission

Bacteria have no defined cell cycle phases or nucleolus; they replicate their circular DNA before the cell divides by binary fission. The S phase belongs to the eukaryotic cell cycle.

60. Answer: (C) 4 genotypes ; 3 phenotypes

Crossing $I^A I^B \times I^A i$ gives $I^A I^A$, $I^A i$, $I^B I^A$ and $I^B i$, which is 4 genotypes. $I^A I^A$ and $I^A i$ are both blood group A, so the phenotypes are A, AB and B, which is 3. Group O cannot appear because no child can be ii.

61. Answer: (D) Glycocalyx

The glycocalyx, the outermost envelope as a loose slime layer or a thick capsule, makes the bacterial cell sticky. The cell wall gives shape and support, and bacteria have no nuclear membrane at all.

62. Answer: (A) r-RNA

rRNA is the most abundant RNA in any cell, about 80% of total RNA, because it is the structural and catalytic part of the very large number of ribosomes. mRNA forms only a few percent, as it is short-lived and varies from gene to gene.

63. Answer: (B) Rhodospirillum - Mycorrhiza

Rhodospirillum is a free-living, anaerobic photosynthetic nitrogen-fixing bacterium, while mycorrhiza is an association of a fungus with plant roots, so that pairing is the mismatch. *Frankia* forms root nodules on *Alnus*, *Anabaena* is a nitrogen-fixing cyanobacterium and *Rhizobium* nodulates legumes such as alfalfa.

64. Answer: (D) Angiosperms

Double fertilisation, syngamy plus triple fusion to form the triploid primary endosperm nucleus, is a unique feature of angiosperms. Gymnosperms have a haploid endosperm formed before fertilisation.

65. Answer: (C) Corpus luteum

The corpus luteum forms from the ruptured Graafian follicle after ovulation, secretes progesterone, and degenerates if pregnancy does not follow, so it is temporary. The pineal gland is permanent, and the corpus cardiacum and corpus allatum are insect glands.

66. Answer: (C) Secondary xylem

The vascular cambium cuts off secondary xylem towards the inside and secondary phloem towards the outside. Phelloderm and the rest of the periderm come from the cork cambium, and primary phloem comes from procambium.

67. Answer: (D) The lagging strand away from the replication fork.

DNA polymerase works only $5' \rightarrow 3'$, so on the lagging strand it makes short Okazaki fragments in the direction away from the moving replication fork, and ligase joins them. The leading strand is made continuously towards the fork and needs no fragments.

68. Answer: (B) directional as it pushes the mean of the character in one direction.

Choosing only high-yielding cows for breeding generation after generation moves the mean milk yield of the population steadily towards one extreme, which is directional selection. Stabilising selection favours the average value, and disruptive selection favours both extremes.

69. Answer: (D) lipase, amylase, trypsinogen, procarboxypeptidase

Pancreatic juice contains inactive trypsinogen, chymotrypsinogen and procarboxypeptidase, along with amylase, lipases and nucleases. Pepsin and rennin are gastric enzymes and maltase comes from intestinal juice, so groups containing them are wrong.

70. Answer: (A) Drupe

Coconut develops from a monocarpellary superior ovary and is one-seeded, with a fibrous mesocarp and a hard stony endocarp, which makes it a drupe like mango. A berry has a fleshy pericarp throughout, and a nut has a single hard woody pericarp.

71. Answer: (A) Zero

By convention, pure water at standard temperature and atmospheric pressure has the highest water potential, set at zero. Adding any solute lowers it, so solutions have negative values.

72. Answer: (A) 50%

NCERT states that mucosa-associated lymphoid tissue (MALT), lining the respiratory, digestive and urogenital tracts, makes up about 50 percent of the lymphoid tissue in the human body. The other percentages do not match this figure.

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.