

NEET 2013 — Biology Question Paper with Solutions

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

NEET 2013

1. Select the wrong statement:

- (A) Isogametes are similar in structure, function and behaviour
- (B) Anisogametes differ either in structure, function or behaviour
- (C) In Oomycetes female gamete is smaller and motile, while male gamete is larger and non-motile
- (D) Chlamydomonas exhibits both isogamy and anisogamy and Fucus shows oogamy

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2. Which one of the following is not a correct statement ?

- (A) Herbarium houses dried, pressed and preserved plant specimens
- (B) Botanical gardens have collection of living plants for reference
- (C) A museum has collection of photographs of plants and animals
- (D) Key is a taxonomic aid for identification of specimens

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3. Isogamous condition with non-flagellated gametes is found in

- (A) Chlamydomonas
- (B) Spirogyra
- (C) Volvox
- (D) Fucus

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4. Besides paddy fields, cyanobacteria are also found inside vegetative part of

- (A) Pinus
- (B) Cycas
- (C) Equisetum
- (D) Psilotum

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5. Read the following statements (A-E) and answer the question which follows them:

- (A) In liverworts, mosses and ferns gametophytes are free-living
- (B) Gymnosperms and some ferns are heterosporous
- (C) Sexual reproduction in Fucus, Volvox and Albugo is oogamous
- (D) The sporophyte in liverworts is more elaborate than that in mosses
- (E) Both Pinus and Marchantia are dioecious

How many of the above statements are correct?

- (A) One
- (B) Two
- (C) Three
- (D) Four

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6. Interfascicular cambium develops from the cells of

- (A) Medullary rays
- (B) Xylem parenchyma
- (C) Endodermis
- (D) Pericycle

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7. In china rose the flowers are

- (A) Actinomorphic, hypogynous with twisted aestivation
- (B) Actinomorphic, epigynous with valvate aestivation
- (C) Zygomorphic, hypogynous with imbricate aestivation
- (D) Zygomorphic, epigynous with twisted aestivation

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8. Lenticels are involved in

- (A) Transpiration
- (B) Gaseous exchange
- (C) Food transport
- (D) Photosynthesis

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9. Age of a tree can be estimated by

- (A) Its height and girth
- (B) Biomass
- (C) Number of annual rings
- (D) Diameter of its heartwood

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10. Transition state structure of the substrate formed during an enzymatic reaction is

- (A) Transient but stable
- (B) Permanent but unstable
- (C) Transient and unstable
- (D) Permanent and stable

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11. A phosphoglyceride is always made up of

- (A) Only a saturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached
- (B) Only an unsaturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached
- (C) A saturated or unsaturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached
- (D) A saturated or unsaturated fatty acid esterified to a phosphate group which is also attached to a glycerol molecule

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12. Pigment-containing membranous extensions in some cyanobacteria are

- (A) Heterocysts
- (B) Basal bodies
- (C) Pneumatophores
- (D) Chromatophores

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13. A major site for synthesis of lipids is

- (A) RER
- (B) SER
- (C) Symplast
- (D) Nucleoplasm

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14. The complex formed by a pair of synapsed homologous chromosomes is called

- (A) Equatorial plate
- (B) Kinetochore
- (C) Bivalent
- (D) Axoneme

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15. The most abundant intracellular cation is

- (A) Na^+
- (B) Ca^{2+}
- (C) H^+
- (D) K^+

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16. During seed germination its stored food is mobilized by

- (A) Ethylene
- (B) Cytokinin
- (C) ABA
- (D) Gibberellin

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17. Which one of the following statements is correct?

- (A) Hard outer layer of pollen is called intine
- (B) Sporogenous tissue is haploid
- (C) Endothecium produces the microspores
- (D) Tapetum nourishes the developing pollen

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18. Product of sexual reproduction generally generates

- (A) Longer viability of seeds
- (B) Prolonged dormancy
- (C) New genetic combination leading to variation
- (D) Large biomass

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19. Meiosis takes place in

- (A) Meiocyte
- (B) Conidia
- (C) Gemmule
- (D) Megaspore

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20. Advantage of cleistogamy is

- (A) Higher genetic variability
- (B) More vigorous offspring
- (C) No dependence on pollinators
- (D) Vivipary

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21. Monoecious plant of Chara shows occurrence of

- (A) Antheridiophore and archegoniophore on the same plant
- (B) Stamen and carpel on the same plant
- (C) Upper antheridium and lower oogonium on the same plant
- (D) Upper oogonium and lower antheridium on the same plant

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22. Perisperm differs from endosperm in

- (A) Being a haploid tissue
- (B) Having no reserve food
- (C) Being a diploid tissue
- (D) Its formation by fusion of secondary nucleus with several sperms

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23. Which of the following statements is not true of two genes that show 50% recombination frequency?

- (A) The genes may be on different chromosomes
- (B) The genes are tightly linked
- (C) The genes show independent assortment
- (D) If the genes are present on the same chromosome, they undergo more than one crossover in every meiosis

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24. Variation in gene frequencies within populations can occur by chance rather than by natural selection. This is referred to as

- (A) Genetic flow
- (B) Genetic drift
- (C) Random mating
- (D) Genetic load

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25. If two persons with 'AB' blood group marry and have sufficiently large number of children, these children could be classified as 'A' blood group : 'AB' blood group : 'B' blood group in 1 : 2 : 1 ratio. Modern technique of protein electrophoresis reveals presence of both 'A' and 'B' type proteins in 'AB' blood group individuals. This is an example of

- (A) Codominance
- (B) Incomplete dominance
- (C) Partial dominance
- (D) Complete dominance

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26. The process by which organisms with different evolutionary history evolve similar phenotypic adaptations in response to a common environmental challenge is called

- (A) Natural selection
- (B) Convergent evolution
- (C) Non-random evolution
- (D) Adaptive radiation

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27. The tendency of population to remain in genetic equilibrium may be disturbed by

- (A) random mating
- (B) lack of migration
- (C) lack of mutations
- (D) lack of random mating

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28. Which of the following Bt crops is being grown in India by the farmers?

- (A) Maize
- (B) Cotton
- (C) Brinjal
- (D) Soybean

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29. A good producer of citric acid is

- (A) Aspergillus
- (B) Pseudomonas
- (C) Clostridium
- (D) Saccharomyces

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30. DNA fragments generated by the restriction endonucleases in a chemical reaction can be separated by

- (A) Centrifugation
- (B) Polymerase chain reaction
- (C) Electrophoresis
- (D) Restriction mapping

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31. Which of the following is not correctly matched for the organism and its cell wall degrading enzyme?

- (A) Bacteria – Lysozyme
- (B) Plant cells – Cellulase
- (C) Algae – Methylase
- (D) Fungi – Chitinase

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32. Which of the following are likely to be present in deep sea water?

- (A) Archaeobacteria
- (B) Eubacteria
- (C) Blue-green algae
- (D) Saprophytic fungi

NEET 2013 · Q111

33. Which of the following criteria does not pertain to facilitated transport ?

- (A) Requirement of special membrane proteins
- (B) High selectivity
- (C) Transport saturation
- (D) Uphill transport

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34. Natural reservoir of phosphorus is

- (A) Sea water
- (B) Animal bones
- (C) Rock
- (D) Fossils

NEET 2013 · Q112

35. The first stable product of fixation of atmospheric nitrogen in leguminous plants is

- (A) NO_2^-
- (B) Ammonia
- (C) NO_3^-
- (D) Glutamate

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36. Secondary productivity is rate of formation of new organic matter by

- (A) Producer
- (B) Parasite
- (C) Consumer
- (D) Decomposer

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37. Which one of the following is not used for ex situ plant conservation?

- (A) Field gene banks
- (B) Seed banks
- (C) Shifting cultivation
- (D) Botanical Gardens

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38. Which of the following represent maximum number of species among global biodiversity?

- (A) Algae
- (B) Lichens
- (C) Fungi
- (D) Mosses and Ferns

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39. Which of the following are correctly matched with respect to their taxonomic classification?

- (A) Flying fish, cuttlefish, silverfish – Pisces
- (B) Centipede, millipede, spider, scorpion – Insecta
- (C) House fly, butterfly, tsetse fly, silverfish – Insecta
- (D) Spiny anteater, sea urchin, sea cucumber – Echinodermata

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40. Which group of animals belong to the same phylum?

- (A) Malarial parasite, Amoeba, Mosquito
- (B) Earthworm, Pinworm, Tapeworm
- (C) Prawn, Scorpion, Locusta
- (D) Sponge, Sea anemone, Starfish

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41. One of the representatives of Phylum Arthropoda is

- (A) cuttlefish
- (B) silverfish
- (C) pufferfish
- (D) flying fish

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42. What external changes are visible after the last moult of a cockroach nymph?

- (A) Mandibles become harder
- (B) Anal cerci develop
- (C) Both fore wings and hind wings develop
- (D) Labium develops

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43. The Golgi complex plays a major role

- (A) in trapping the light and transforming it into chemical energy
- (B) in digesting proteins and carbohydrates
- (C) as energy transferring organelles
- (D) in post translational modification of proteins and glycosidation of lipids

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44. Macromolecule chitin is

- (A) nitrogen containing polysaccharide
- (B) phosphorus containing polysaccharide
- (C) sulphur containing polysaccharide
- (D) simple polysaccharide

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45. The essential chemical components of many coenzymes are

- (A) Proteins
- (B) Nucleic acids
- (C) Carbohydrates
- (D) Vitamins

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46. A pregnant female delivers a baby who suffers from stunted growth, mental retardation, low intelligence quotient and abnormal skin. This is the result of

- (A) Deficiency of iodine in diet
- (B) Low secretion of growth hormone
- (C) Cancer of the thyroid gland
- (D) Over secretion of pars distalis

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47. Select the correct statement with respect to locomotion in humans:

- (A) A decreased level of progesterone causes osteoporosis in old people
- (B) Accumulation of uric acid crystals in joints causes their inflammation
- (C) The vertebral column has 10 thoracic vertebrae
- (D) The joint between adjacent vertebrae is a fibrous joint

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48. The characteristic and an example of a synovial joint in humans is

- (A) Fluid cartilage between two bones, limited movements – Knee joint
- (B) Fluid filled between two joints, provides cushion – Skull bones
- (C) Fluid filled synovial cavity between two bones – Joint between atlas and axis
- (D) Lymph filled between two bones, limited movement – Gliding joint between carpals

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49. Which of the following statements is correct in relation to the endocrine system?

- (A) Adenohypophysis is under direct neural regulation of the hypothalamus
- (B) Organs in the body like gastrointestinal tract, heart, kidney and liver do not produce any hormones
- (C) Non-nutrient chemicals produced by the body in trace amount that act as intercellular messenger are known as hormones
- (D) Releasing and inhibitory hormones are produced by the pituitary gland

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50. Select the answer which correctly matches the endocrine gland with the hormone it secretes and its function/deficiency symptom:

- (A) Anterior pituitary – Oxytocin – Stimulates uterus contraction during child birth
- (B) Posterior pituitary – Growth hormone (GH) – Oversecretion stimulates abnormal growth
- (C) Thyroid gland – Thyroxine – Lack of iodine in diet results in goitre
- (D) Corpus luteum – Testosterone – Stimulates spermatogenesis

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51. What is the correct sequence of sperm formation?

- (A) Spermatid, spermatocyte, spermatogonia, spermatozoa
- (B) Spermatogonia, spermatocyte, spermatozoa, spermatid
- (C) Spermatogonia, spermatozoa, spermatocyte, spermatid
- (D) Spermatogonia, spermatocyte, spermatid, spermatozoa

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52. Menstrual flow occurs due to lack of

- (A) Progesterone
- (B) FSH
- (C) Oxytocin
- (D) Vasopressin

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53. Which one of the following is not the function of placenta? It

- (A) facilitates supply of oxygen and nutrients to embryo
- (B) secretes estrogen
- (C) facilitates removal of carbon dioxide and waste material from embryo
- (D) secretes oxytocin during parturition

NEET 2013 · Q134

54. Kyoto Protocol was endorsed at

- (A) CoP-3
- (B) CoP-5
- (C) CoP-6
- (D) CoP-4

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55. Which of the following cannot be detected in a developing foetus by amniocentesis?

- (A) Klinefelter syndrome
- (B) Sex of the foetus
- (C) Down syndrome
- (D) Jaundice

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56. Artificial insemination means

- (A) transfer of sperms of a healthy donor to a test tube containing ova
- (B) transfer of sperms of husband to a test tube containing ova
- (C) artificial introduction of sperms of a healthy donor into the vagina
- (D) introduction of sperms of a healthy donor directly into the ovary

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57. The incorrect statement with regard to haemophilia is

- (A) It is a sex-linked disease
- (B) It is a recessive disease
- (C) It is a dominant disease
- (D) A single protein involved in the clotting of blood is affected

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58. If both parents are carriers for thalassemia, which is an autosomal recessive disorder, what are the chances of pregnancy resulting in an affected child?

- (A) no chance
- (B) 50%
- (C) 25%
- (D) 100%

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59. Which enzyme/s will be produced in a cell in which there is a nonsense mutation in the lac Y gene?

- (A) β -galactosidase
- (B) Lactose permease
- (C) Transacetylase
- (D) Lactose permease and transacetylase

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60. The eye of octopus and eye of cat show different patterns of structure, yet they perform similar function. This is an example of

- (A) Homologous organs that have evolved due to convergent evolution
- (B) Homologous organs that have evolved due to divergent evolution
- (C) Analogous organs that have evolved due to convergent evolution
- (D) Analogous organs that have evolved due to divergent evolution

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61. Infection of Ascaris usually occurs by

- (A) drinking water containing eggs of Ascaris
- (B) eating imperfectly cooked pork
- (C) tsetse fly
- (D) mosquito bite

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62. The cell-mediated immunity inside the human body is carried out by

- (A) T- lymphocytes
- (B) B-lymphocytes
- (C) Thrombocytes
- (D) Erythrocytes

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63. During sewage treatment, biogases are produced which include

- (A) methane, hydrogen sulphide, carbon dioxide
- (B) methane, oxygen, hydrogen sulphide
- (C) hydrogen sulphide, methane, sulphur dioxide
- (D) hydrogen sulphide, nitrogen, methane

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64. A biologist studied the population of rats in a barn. He found that the average natality was 250, average mortality 240, immigration 20 and emigration 30. The net increase in population is

- (A) 10
- (B) 15
- (C) 5
- (D) zero

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65. Which one of the following processes during decomposition is correctly described?

- (A) Fragmentation – Carried out by organisms such as earthworm
- (B) Humification – Leads to the accumulation of a dark coloured substance humus which undergoes microbial action at a very fast rate
- (C) Catabolism – Last step in the decomposition under fully anaerobic condition
- (D) Leaching – Water soluble inorganic nutrients rise to the top layers of soil

NEET 2013 · Q174

66. In plant breeding programmes, the entire collection (of plants/seeds) having all the diverse alleles for all genes in a given crop is called

- (A) selection of superior recombinants
- (B) cross-hybridisation among the selected parents
- (C) evaluation and selection of parents
- (D) germplasm collection

NEET 2013 · Q179

67. Global warming can be controlled by

- (A) Reducing deforestation, cutting down use of fossil fuel
- (B) Reducing reforestation, increasing the use of fossil fuel
- (C) Increasing deforestation, slowing down the growth of human population
- (D) Increasing deforestation, reducing efficiency of energy usage

NEET 2013 · Q180

68. The Air (Prevention and Control of Pollution) Act came into force in

- (A) 1975
- (B) 1981
- (C) 1985
- (D) 1990

Answer key and explanations

1. Answer: (C) In Oomycetes female gamete is smaller and motile, while male gamete is larger and non-motile

Oomycetes are oogamous: the female gamete (egg) is large and non-motile while the male gamete is small, so the statement that the female gamete is smaller and motile is reversed and wrong. The definitions of isogametes and anisogametes are correct, and Chlamydomonas does show isogamy and anisogamy while Fucus is oogamous.

2. Answer: (C) A museum has collection of photographs of plants and animals

A museum keeps preserved specimens of plants and animals (dried, in jars of preservative, stuffed or as skeletons), not a collection of photographs. Herbaria hold dried pressed specimens, botanical gardens hold living plants and keys are taxonomic aids, so those statements are correct.

3. Answer: (B) Spirogyra

Spirogyra shows isogamous conjugation in which the fusing gametes are similar and non-flagellated (amoeboid). Chlamydomonas has flagellated isogametes, while Volvox and Fucus are oogamous.

4. Answer: (B) Cycas

The coralloid roots of Cycas harbour cyanobacteria such as Anabaena and Nostoc in a special zone. Pinus has fungal mycorrhiza instead, and Equisetum and Psilotum have no such cyanobacterial association.

5. Answer: (C) Three

Three statements are correct: gametophytes of liverworts, mosses and ferns are free-living; gymnosperms and some ferns (e.g. Salvinia) are heterosporous; and Fucus, Volvox and Albugo are oogamous. The sporophyte of mosses is more elaborate than that of liverworts, and Pinus is monoecious, so the other two are wrong.

6. Answer: (A) Medullary rays

During secondary growth in a dicot stem, the medullary ray cells lying between the vascular bundles become meristematic and form the interfascicular cambium. Pericycle gives rise to cork cambium or lateral roots, not the interfascicular strip.

7. Answer: (A) Actinomorphic, hypogynous with twisted aestivation

China rose (Hibiscus, Malvaceae) has radially symmetrical (actinomorphic) flowers with a superior ovary (hypogynous) and twisted aestivation of petals. It is neither zygomorphic nor epigynous, and its corolla aestivation is not valvate.

8. Answer: (B) Gaseous exchange

Lenticels are lens-shaped openings in the bark formed by loosely arranged complementary cells, which allow exchange of gases between the inner tissues and the atmosphere. Although a little water may be lost through them, their role is gaseous exchange, not mainly transpiration.

9. Answer: (C) Number of annual rings

Each year's spring wood and autumn wood together form one annual ring, so counting annual rings gives the age of a tree (dendrochronology). Height, girth, biomass and heartwood diameter vary with conditions and do not give age reliably.

10. Answer: (C) Transient and unstable

The transition state of the substrate exists only very briefly at the top of the energy barrier and is a high-energy, unstable structure before it forms product. It is therefore both transient and unstable, not stable or permanent.

11. Answer: (C) A saturated or unsaturated fatty acid esterified to a glycerol molecule to which a phosphate group is also attached

In a phosphoglyceride (e.g. lecithin), fatty acids, which may be saturated or unsaturated, are esterified to glycerol, and the glycerol also carries a phosphate group. The fatty acid is not esterified to the phosphate, and it need not be only saturated or only unsaturated.

12. Answer: (D) Chromatophores

Some cyanobacteria have chromatophores, membranous extensions of the plasma membrane into the cytoplasm that contain pigments. Heterocysts are nitrogen-fixing cells and basal bodies anchor flagella, so neither is a pigment-bearing membrane.

13. Answer: (B) SER

The smooth endoplasmic reticulum, which lacks ribosomes, is the major site of lipid (including steroid) synthesis. Rough ER bears ribosomes and is the site of protein synthesis.

14. Answer: (C) Bivalent

During zygotene the homologous chromosomes pair (synapsis), and each synapsed pair is called a bivalent or tetrad. A kinetochore is the disc on the centromere for spindle attachment, not a chromosome pair.

15. Answer: (D) K⁺

Potassium ion is the chief cation inside cells, while sodium ion is the chief cation of extracellular fluid. Calcium and hydrogen ions are present inside cells at far lower concentrations.

16. Answer: (D) Gibberellin

In germinating cereal grains, gibberellin from the embryo induces the aleurone layer to make hydrolytic enzymes such as α -amylase, which mobilise stored starch. ABA has the opposite effect and promotes dormancy.

17. Answer: (D) Tapetum nourishes the developing pollen

The tapetum, the innermost wall layer of the microsporangium, nourishes the developing pollen grains. The hard outer pollen layer is the exine (intine is inner), sporogenous tissue is diploid, and microspores come from the sporogenous tissue, not the endothecium.

18. Answer: (C) New genetic combination leading to variation

Sexual reproduction involves meiosis and fusion of gametes from two parents, so the offspring carry new genetic combinations that produce variation. Seed viability, dormancy or biomass are not general outcomes of sexual reproduction.

19. Answer: (A) Meiocyte

Meiosis occurs in specialised diploid cells called meiocytes (e.g. microspore and megaspore mother cells). A megaspore is itself a haploid product of meiosis, and conidia and gemmules are asexual structures.

20. Answer: (C) No dependence on pollinators

Cleistogamous flowers never open, so pollen falls directly on the stigma of the same flower and seed set is assured even without pollinators. Because this is self-pollination, it reduces rather than increases genetic variability.

21. Answer: (D) Upper oogonium and lower antheridium on the same plant

In Chara the female sex organ, the oogonium (nucule), is borne above the male antheridium (globule) at the same node of a monoecious plant. Antheridiophores and archegoniophores belong to Marchantia, and stamens and carpels to flowering plants.

22. Answer: (C) Being a diploid tissue

Perisperm is residual, persistent nucellus, a diploid maternal tissue, whereas endosperm is triploid, formed by fusion of a male gamete with the two polar nuclei. Perisperm does store food (e.g. black pepper), so it is not a tissue without reserves.

23. Answer: (B) The genes are tightly linked

A recombination frequency of 50% is the maximum and is what unlinked genes show, so such genes behave as if assorting independently, whether on different chromosomes or far apart on one chromosome with multiple crossovers. Tightly linked genes show very low recombination, so calling them tightly linked is the untrue statement.

24. Answer: (B) Genetic drift

A change in allele frequency that happens by chance, not by selection, is genetic drift, and it is strongest in small populations. Gene flow is change due to migration, not chance.

25. Answer: (A) Codominance

In AB individuals both the IA and IB alleles are fully expressed, producing both A and B proteins, which is codominance. In incomplete dominance the heterozygote would have an intermediate phenotype instead of showing both parental products.

26. Answer: (B) Convergent evolution

When unrelated lineages facing similar environments evolve similar adaptations, the process is convergent evolution, which produces analogous structures. Adaptive radiation is the opposite pattern, where one ancestor gives rise to many differently adapted forms.

27. Answer: (D) lack of random mating

Hardy-Weinberg equilibrium needs random mating, no migration, no mutation, no selection and a large population. Lack of random mating disturbs the equilibrium, whereas random mating and absence of migration or mutation help maintain it.

28. Answer: (B) Cotton

Bt cotton, carrying cry genes from *Bacillus thuringiensis*, is the Bt crop approved and grown by Indian farmers. Bt brinjal was developed but its commercial release was put under moratorium.

29. Answer: (A) Aspergillus

The fungus *Aspergillus niger* is the industrial producer of citric acid. *Saccharomyces* is used for ethanol and baking, and *Clostridium* for butyric acid.

30. Answer: (C) Electrophoresis

DNA fragments, being negatively charged, move towards the anode through an agarose gel and are separated by size in gel electrophoresis. PCR amplifies DNA and does not separate fragments.

31. Answer: (C) Algae - Methylase

Methylase adds methyl groups to DNA and does not break down cell walls, so pairing it with algae is the wrong match. Lysozyme breaks bacterial walls, cellulase plant walls and chitinase fungal walls.

32. Answer: (A) Archaeobacteria

Archaeobacteria live in extreme habitats, and methanogens and other archaea are common in deep-sea sediments and hydrothermal vents. Blue-green algae need light and so are restricted to surface waters.

33. Answer: (D) Uphill transport

Facilitated transport moves molecules down their concentration gradient through special membrane proteins, so it is selective and saturable but needs no energy. Uphill transport against a gradient requires energy and is active transport.

34. Answer: (C) Rock

Phosphorus has no significant gaseous phase, and its natural reservoir is phosphate-bearing rock, which releases phosphate on weathering. Bones and fossils hold only small, secondary amounts.

35. Answer: (B) Ammonia

Nitrogenase in root nodules reduces atmospheric N_2 to ammonia, the first stable product of biological nitrogen fixation. Glutamate is formed later when ammonia is assimilated, and nitrite and nitrate come from nitrification, not fixation.

36. Answer: (C) Consumer

Secondary productivity is the rate at which consumers form new organic matter from the food they assimilate. Formation of organic matter by producers is primary productivity.

37. Answer: (C) Shifting cultivation

Shifting (slash-and-burn) cultivation clears forest and destroys biodiversity, so it is not a conservation method. Field gene banks, seed banks and botanical gardens all keep plants away from their natural habitat, which is ex situ conservation.

38. Answer: (C) Fungi

In the global species distribution of plants, fungi form a larger share than algae, lichens, or mosses and ferns combined. Among the options, fungi therefore represent the largest number of species.

39. Answer: (C) House fly, butterfly, tsetse fly, silverfish - Insecta

House fly, butterfly, tsetse fly and silverfish all belong to class Insecta. Cuttlefish and silverfish are not fishes, centipedes, millipedes, spiders and scorpions are not insects, and the spiny anteater is a mammal, not an echinoderm.

40. Answer: (C) Prawn, Scorpion, Locusta

Prawn, scorpion and Locusta all have jointed appendages and a chitinous exoskeleton, placing them in phylum Arthropoda. The other groups mix phyla, e.g. earthworm is an annelid, pinworm a nematode and tapeworm a flatworm.

41. Answer: (B) silverfish

Silverfish (*Lepisma*) is a wingless insect and hence an arthropod. Cuttlefish is a mollusc, and pufferfish and flying fish are bony fishes.

42. Answer: (C) Both fore wings and hind wings develop

Cockroach nymphs resemble adults but lack wings; wing pads grow with successive moults and fully formed fore wings (tegmina) and hind wings appear after the last moult. Mouthparts and anal cerci are already present in nymphs.

43. Answer: (D) in post translational modification of proteins and glycosidation of lipids

The Golgi apparatus modifies proteins received from the ER and is the site of formation of glycoproteins and glycolipids. Trapping light belongs to chloroplasts, digestion to lysosomes and energy transfer to mitochondria.

44. Answer: (A) nitrogen containing polysaccharide

Chitin is a homopolymer of N-acetylglucosamine, so it is a nitrogen-containing polysaccharide. It is a complex polysaccharide with amino sugar units, not a simple one, and it has no phosphorus or sulphur.

45. Answer: (D) Vitamins

Many coenzymes are derived from vitamins, e.g. NAD and NADP contain niacin and FAD contains riboflavin. Coenzymes are non-protein organic compounds, so proteins are not their components.

46. Answer: (A) Deficiency of iodine in diet

Iodine deficiency during pregnancy causes hypothyroidism in the developing baby, leading to cretinism with stunted growth, mental retardation, low IQ and abnormal skin. Low growth hormone causes dwarfism without mental retardation.

47. Answer: (B) Accumulation of uric acid crystals in joints causes their inflammation

Gout is inflammation of joints caused by accumulation of uric acid crystals. Osteoporosis in old age is linked to decreased oestrogen, there are 12 thoracic vertebrae, and joints between vertebrae are cartilaginous, not fibrous.

48. Answer: (C) Fluid filled synovial cavity between two bones - Joint between atlas and axis

Synovial joints have a fluid-filled synovial cavity between the articulating bones, and the pivot joint between atlas and axis is an example. Skull bones are joined by immovable fibrous sutures, and synovial fluid is not lymph.

49. Answer: (C) Non-nutrient chemicals produced by the body in trace amount that act as intercellular messenger are known as hormones

Hormones are defined as non-nutrient chemicals produced in trace amounts that act as intercellular messengers. The adenohypophysis is controlled by hypothalamic hormones via the portal system, not directly by nerves, and releasing hormones come from the hypothalamus, not the pituitary.

50. Answer: (C) Thyroid gland - Thyroxine - Lack of iodine in diet results in goitre

The thyroid secretes thyroxine, and lack of iodine in the diet causes goitre. Oxytocin is released by the posterior pituitary and GH by the anterior pituitary, and testosterone comes from Leydig cells, not the corpus luteum.

51. Answer: (D) Spermatogonia, spermatocyte, spermatid, spermatozoa

Spermatogonia enlarge into primary spermatocytes, which undergo meiosis to form secondary spermatocytes and then spermatids, and spermatids differentiate into spermatozoa (spermiogenesis). Spermatids come before spermatozoa, not after.

52. Answer: (A) Progesterone

Without fertilisation the corpus luteum degenerates and progesterone falls, so the endometrium breaks down and is shed as menstrual flow. FSH, oxytocin and vasopressin do not maintain the endometrium.

53. Answer: (D) secretes oxytocin during parturition

Oxytocin for parturition is released from the mother's posterior pituitary, not secreted by the placenta. The placenta does supply oxygen and nutrients, removes carbon dioxide and wastes, and secretes oestrogen, progesterone and hCG.

54. Answer: (A) CoP-3

The Kyoto Protocol was adopted at the third Conference of the Parties (COP-3) of the UNFCCC in Kyoto in 1997. Later COPs worked out its rules but did not adopt it.

55. Answer: (D) Jaundice

Amniocentesis examines foetal cells in amniotic fluid to detect chromosomal abnormalities such as Down and Klinefelter syndromes and can reveal sex. Jaundice is a postnatal condition of bilirubin build-up and cannot be detected this way.

56. Answer: (C) artificial introduction of sperms of a healthy donor into the vagina

In artificial insemination, semen from the husband or a healthy donor is introduced artificially into the female tract (vagina or uterus). Transferring sperm to ova in a test tube is in vitro fertilisation, and sperm are not placed into the ovary.

57. Answer: (C) It is a dominant disease

Haemophilia is an X-linked recessive disorder in which a single clotting factor protein is affected. Calling it a dominant disease is the incorrect statement.

58. Answer: (C) 25%

Two carriers ($Tt \times Tt$) give $TT : Tt : tt$ in a 1 : 2 : 1 ratio, so the chance of an affected (tt) child is $1/4$, i.e. 25%. 50% is the chance of a carrier child.

59. Answer: (A) β -galactosidase

The lac operon genes are transcribed in the order z, y, a . A nonsense mutation in $lacY$ stops translation of permease, but β -galactosidase from $lacZ$, which lies upstream, is still made. Permease cannot be produced, and transacetylase downstream is lost or greatly reduced.

60. Answer: (C) Analogous organs that have evolved due to convergent evolution

The eyes of octopus (a mollusc) and cat (a mammal) differ in structure and origin but perform the same function, so they are analogous organs, which arise by convergent evolution. Homologous organs share origin but may differ in function.

61. Answer: (A) drinking water containing eggs of Ascaris

Ascaris eggs passed in faeces contaminate soil, water and vegetables, and infection occurs by swallowing these eggs with water or food. Undercooked pork transmits Taenia, and mosquitoes and tsetse flies transmit other parasites.

62. Answer: (A) T- lymphocytes

Cell-mediated immunity is carried out by T-lymphocytes, which act directly on infected cells and grafts. B-lymphocytes produce antibodies, giving humoral immunity.

63. Answer: (A) methane, hydrogen sulphide, carbon dioxide

In the anaerobic sludge digesters of a sewage treatment plant, bacteria produce biogas consisting of methane, hydrogen sulphide and carbon dioxide. Oxygen is not produced under anaerobic conditions.

64. Answer: (D) zero

Change in population = (natality + immigration) – (mortality + emigration) = (250 + 20) – (240 + 30) = 270 – 270 = 0. Taking only natality minus mortality gives the trap answer 10.

65. Answer: (A) Fragmentation - Carried out by organisms such as earthworm

Fragmentation, the breaking of detritus into small particles, is carried out by detritivores such as earthworms. Humus decomposes extremely slowly, leaching carries soluble nutrients down into lower soil layers, and catabolism is enzymatic breakdown, not the last anaerobic step.

66. Answer: (D) germplasm collection

The entire collection of plants or seeds carrying all the diverse alleles of all genes of a crop is called germplasm collection, the first step of plant breeding. Selection of parents and cross-hybridisation are later steps that use this collection.

67. Answer: (A) Reducing deforestation, cutting down use of fossil fuel

Reducing deforestation keeps carbon dioxide absorbed by trees, and cutting fossil fuel use reduces carbon dioxide emissions, so both help control global warming. Increasing deforestation or fossil fuel use, or reducing energy efficiency, would worsen it.

68. Answer: (B) 1981

India's Air (Prevention and Control of Pollution) Act was enacted and came into force in 1981; it was amended in 1987 to include noise. The Water Act was 1974 and the Environment (Protection) Act 1986.

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.