NEET 2024 — Biology Question Paper with Solutions

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

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1. Lecithin, a small molecular weight organic compound found in living tissues, is an example of:

(A) Amino acids
(B) Phospholipids
(C) Glycerides
(D) Carbohydrates

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2. How many molecules of ATP and NADPH are required for every molecule of CO_2 fixed in the Calvin cycle?

(A) 2 molecules of ATP and 3 molecules of NADPH
(B) 2 molecules of ATP and 2 molecules of NADPH
(C) 3 molecules of ATP and 3 molecules of NADPH
(D) 3 molecules of ATP and 2 molecules of NADPH

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3. Hind II always cuts DNA molecules at a particular point called recognition sequence and it consists of:

(A) 8 bp
(B) 6 bp
(C) 4 bp
(D) 10 bp

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4. The cofactor of the enzyme carboxypeptidase is:

(A) Zinc
(B) Niacin
(C) Flavin
(D) Haem

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5. The capacity to generate a whole plant from any cell of the plant is called:

(A) Totipotency
(B) Micropropagation
(C) Differentiation
(D) Somatic hybridization

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6. Match List I with List II

List - I | List - II
A. Rhizopus | I. Mushroom
B. Ustilago | II. Smut fungus
C. Puccinia | III. Bread mould
D. Agaricus | IV. Rust fungus

Choose the correct answer from the options given below:

(A) A-III, B-II, C-IV, D-I
(B) A-I, B-III, C-II, D-IV
(C) A-III, B-II, C-I, D-IV
(D) A-IV, B-III, C-II, D-I

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7. Given below are two statements:
Statement I : Bt toxins are insect group specific and coded by a gene cry IAc.
Statement II : Bt toxin exists as inactive protoxin in B. thuringiensis. However, after ingestion by the insect the inactive protoxin gets converted into active form due to acidic pH of the insect gut.
In the light of the above statements, choose the correct answer from the options given below:

(A) Both Statement I and Statement II are true
(B) Both Statement I and Statement II are false
(C) Statement I is true but Statement II is false
(D) Statement I is false but Statement II is true

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8. Which of the following is an example of actinomorphic flower?

(A) Datura
(B) Cassia
(C) Pisum
(D) Sesbania

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9. Identify the set of correct statements:
A. The flowers of Vallisneria are colourful and produce nectar.
B. The flowers of water lily are not pollinated by water.
C. In most of water-pollinated species, the pollen grains are protected from wetting.
D. Pollen grains of some hydrophytes are long and ribbon like.
E. In some hydrophytes, the pollen grains are carried passively inside water.
Choose the correct answer from the options given below.

(A) C, D and E only
(B) A, B, C and D only
(C) A, C, D and E only
(D) B, C, D and E only

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10. The lactose present in the growth medium of bacteria is transported to the cell by the action of

(A) Beta-galactosidase
(B) Acetylase
(C) Permease
(D) Polymerase

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11. Match List I with List II
List - I | List - II
A. Clostridium butylicum | I. Ethanol
B. Saccharomyces cerevisiae | II. Streptokinase
C. Trichoderma polysporum | III. Butyric acid
D. Streptococcus sp. | IV. Cyclosporin-A
Choose the correct answer from the options given below:

(A) A-III, B-I, C-II, D-IV
(B) A-II, B-IV, C-III, D-I
(C) A-III, B-I, C-IV, D-II
(D) A-IV, B-I, C-III, D-II

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12. The equation of Verhulst-Pearl logistic growth is dN/dt = rN[(K − N)/K]. From this equation, K indicates:

(A) Intrinsic rate of natural increase
(B) Biotic potential
(C) Carrying capacity
(D) Population density

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13. Auxin is used by gardeners to prepare weed-free lawns. But no damage is caused to grass as auxin

(A) promotes apical dominance.
(B) promotes abscission of mature leaves only.
(C) does not affect mature monocotyledonous plants.
(D) can help in cell division in grasses, to produce growth.

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14. Given below are two statements:
Statement I : Parenchyma is living but collenchyma is dead tissue.
Statement II : Gymnosperms lack xylem vessels but presence of xylem vessels is the characteristic of angiosperms.
In the light of the above statements, choose the correct answer from the options given below:

(A) Both Statement I and Statement II are true
(B) Both Statement I and Statement II are false
(C) Statement I is true but Statement II is false
(D) Statement I is false but Statement II is true

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15. These are regarded as major causes of biodiversity loss:
A. Over exploitation
B. Co-extinction
C. Mutation
D. Habitat loss and fragmentation
E. Migration
Choose the correct option:

(A) A, C and D only
(B) A, B, C and D only
(C) A, B and E only
(D) A, B and D only

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16. Which one of the following is not a criterion for classification of fungi?

(A) Morphology of mycelium
(B) Mode of nutrition
(C) Mode of spore formation
(D) Fruiting body

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17. List of endangered species was released by

(A) GEAC
(B) WWF
(C) FOAM
(D) IUCN

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18. What is the fate of a piece of DNA carrying only gene of interest which is transferred into an alien organism?

A. The piece of DNA would be able to multiply itself independently in the progeny cells of the organism.

B. It may get integrated into the genome of the recipient.

C. It may multiply and be inherited along with the host DNA.

D. The alien piece of DNA is not an integral part of chromosome.

E. It shows ability to replicate.

Choose the correct answer from the options given below:

(A) A and B only
(B) D and E only
(C) B and C only
(D) A and E only

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19. Which one of the following can be explained on the basis of Mendel's Law of Dominance?

A. Out of one pair of factors one is dominant and the other is recessive.

B. Alleles do not show any expression and both the characters appear as such in F_2 generation.

C. Factors occur in pairs in normal diploid plants.

D. The discrete unit controlling a particular character is called factor.

E. The expression of only one of the parental characters is found in a monohybrid cross.

Choose the correct answer from the options given below:

(A) A, B and C only
(B) A, C, D and E only
(C) B, C and D only
(D) A, B, C, D and E

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20. Inhibition of Succinic dehydrogenase enzyme by malonate is a classical example of:

(A) Cofactor inhibition
(B) Feedback inhibition
(C) Competitive inhibition
(D) Enzyme activation

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21. Formation of interfascicular cambium from fully developed parenchyma cells is an example for

(A) Differentiation
(B) Redifferentiation
(C) Dedifferentiation
(D) Maturation

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22. Tropical regions show greatest level of species richness because

A. Tropical latitudes have remained relatively undisturbed for millions of years, hence more time was available for species diversification.

B. Tropical environments are more seasonal.

C. More solar energy is available in tropics.

D. Constant environments promote niche specialization.

E. Tropical environments are constant and predictable.

Choose the correct answer from the options given below.

(A) A, C, D and E only

(B) A and B only

(C) A, B and E only

(D) A, B and D only

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23. Given below are two statements:

Statement I : Chromosomes become gradually visible under light microscope during leptotene stage.

Statement II : The beginning of diplotene stage is recognized by dissolution of synaptonemal complex.

In the light of the above statements, choose the correct answer from the options given below:

(A) Both Statement I and Statement II are true

(B) Both Statement I and Statement II are false

(C) Statement I is true but Statement II is false

(D) Statement I is false but Statement II is true

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24. Match List I with List II

List - I | List - II

A. Nucleolus | I. Site of formation of glycolipid

B. Centriole | II. Organization like the cartwheel

C. Leucoplasts | III. Site of active ribosomal RNA synthesis

D. Golgi apparatus | IV. For storing nutrients

Choose the correct answer from the options given below:

(A) A-III, B-II, C-IV, D-I

(B) A-II, B-III, C-I, D-IV

(C) A-III, B-IV, C-II, D-I

(D) A-I, B-II, C-III, D-IV

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25. Bulliform cells are responsible for

(A) Inward curling of leaves in monocots.

(B) Protecting the plant from salt stress.

(C) Increased photosynthesis in monocots.

(D) Providing large spaces for storage of sugars.

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26. A pink flowered Snapdragon plant was crossed with a red flowered Snapdragon plant. What type of phenotype/s is/are expected in the progeny?

(A) Only red flowered plants

(B) Red flowered as well as pink flowered plants

(C) Only pink flowered plants

(D) Red, Pink as well as white flowered plants

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27. A transcription unit in DNA is defined primarily by the three regions in DNA and these are with respect to upstream and down stream end;

(A) Repressor, Operator gene, Structural gene
(B) Structural gene, Transposons, Operator gene
(C) Inducer, Repressor, Structural gene
(D) Promotor, Structural gene, Terminator

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28. In a plant, black seed color (BB/Bb) is dominant over white seed color (bb). In order to find out the genotype of the black seed plant, with which of the following genotype will you cross it?

(A) BB
(B) bb
(C) Bb
(D) BB/Bb

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29. Which of the following are required for the dark reaction of photosynthesis?

A. Light
B. Chlorophyll
C. CO_2
D. ATP
E. NADPH

Choose the correct answer from the options given below:

(A) A, B and C only
(B) B, C and D only
(C) C, D and E only
(D) D and E only

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30. Match List I with List II

List - I	List - II
A. Two or more alternative forms of a gene	I. Back cross
B. Cross of F_1 progeny with homozygous recessive parent	II. Ploidy
C. Cross of F_1 progeny with any of the parents	III. Allele
D. Number of chromosome sets in plant	IV. Test cross

Choose the correct answer from the options given below:

(A) A-I, B-II, C-III, D-IV
(B) A-II, B-I, C-III, D-IV
(C) A-III, B-IV, C-I, D-II
(D) A-IV, B-III, C-II, D-I

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31. The DNA present in chloroplast is:

(A) Linear, double stranded
(B) Circular, double stranded
(C) Linear, single stranded
(D) Circular, single stranded

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32. Match List I with List II

List - I | List - II

A. Robert May | I. Species-Area relationship

B. Alexander von Humboldt | II. Long term ecosystem experiment using out door plots

C. Paul Ehrlich | III. Global species diversity at about 7 million

D. David Tilman | IV. Rivet popper hypothesis

Choose the correct answer from the options given below:

(A) A-II, B-III, C-I, D-IV
(B) A-III, B-I, C-IV, D-II
(C) A-I, B-III, C-II, D-IV
(D) A-III, B-IV, C-II, D-I

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33. Match List I with List II

List - I | List - II

A. Rose | I. Twisted aestivation

B. Pea | II. Perigynous flower

C. Cotton | III. Drupe

D. Mango | IV. Marginal placentation

Choose the correct answer from the options given below :

(A) A-II, B-IV, C-I, D-III
(B) A-I, B-II, C-III, D-IV
(C) A-IV, B-III, C-II, D-I
(D) A-II, B-III, C-IV, D-I

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34. Which of the following statement is correct regarding the process of replication in E.coli?

(A) The DNA dependent DNA polymerase catalyses polymerization in one direction that is 3′ → 5′
(B) The DNA dependent RNA polymerase catalyses polymerization in one direction, that is 5′ → 3′
(C) The DNA dependent DNA polymerase catalyses polymerization in 5′ → 3′ as well as 3′ → 5′ direction
(D) The DNA dependent DNA polymerase catalyses polymerization in 5′ → 3′ direction

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35. Match List I with List II

List - I | List - II

A. Citric acid cycle | I. Cytoplasm

B. Glycolysis | II. Mitochondrial matrix

C. Electron transport system | III. Intermembrane space of mitochondria

D. Proton gradient | IV. Inner mitochondrial membrane

Choose the correct answer from the options given below:

(A) A-I, B-II, C-III, D-IV
(B) A-II, B-I, C-IV, D-III
(C) A-III, B-IV, C-I, D-II
(D) A-IV, B-III, C-II, D-I

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36. Read the following statements and choose the set of correct statements:
In the members of Phaeophyceae,
A. Asexual reproduction occurs usually by biflagellate zoospores.
B. Sexual reproduction is by oogamous method only.
C. Stored food is in the form of carbohydrates which is either mannitol or laminarin.
D. The major pigments found are chlorophyll a, c and carotenoids and xanthophyll.
E. Vegetative cells have a cellulosic wall, usually covered on the outside by gelatinous coating of algin.
Choose the correct answer from the options given below:

(A) A, B, C and D only
(B) B, C, D and E only
(C) A, C, D and E only
(D) A, B, C and E only

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37. Match List I with List II

List - I	List - II
A. GLUT-4	I. Hormone
B. Insulin	II. Enzyme
C. Trypsin	III. Intercellular ground substance
D. Collagen	IV. Enables glucose transport into cells

Choose the correct answer from the options given below.

(A) A-IV, B-I, C-II, D-III
(B) A-I, B-II, C-III, D-IV
(C) A-II, B-III, C-IV, D-I
(D) A-III, B-IV, C-I, D-II

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38. Identify the step in tricarboxylic acid cycle, which does not involve oxidation of substrate.

(A) Malic acid → Oxaloacetic acid
(B) Succinic acid → Malic acid
(C) Succinyl-CoA → Succinic acid
(D) Isocitrate → α-ketoglutaric acid

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39. Given below are two statements:
Statement I: In C_3 plants, some O_2 binds to RuBisCO, hence CO_2 fixation is decreased.
Statement II: In C_4 plants, mesophyll cells show very little photorespiration while bundle sheath cells do not show photorespiration.
In the light of the above statements, choose the correct answer from the options given below:

(A) Both Statement I and Statement II are true
(B) Both Statement I and Statement II are false
(C) Statement I is true but Statement II is false
(D) Statement I is false but Statement II is true

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40. Match List I with List II

List - I (Types of Stamens) | List - II (Example)

A. Monoadelphous | I. Citrus

B. Diadelphous | II. Pea

C. Polyadelphous | III. Lily

D. Epiphyllous | IV. China-rose

Choose the correct answer from the options given below:

(A) A-IV, B-II, C-I, D-III

(B) A-IV, B-I, C-II, D-III

(C) A-I, B-II, C-IV, D-III

(D) A-III, B-I, C-IV, D-II

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41. Match List I with List II

List - I | List - II

A. Frederick Griffith | I. Genetic code

B. Francois Jacob & Jacque Monod | II. Semi-conservative mode of DNA replication

C. Har Gobind Khorana | III. Tranformation

D. Meselson & Stahl | IV. Lac operon

Choose the correct answer from the options given below:

(A) A-III, B-II, C-I, D-IV

(B) A-III, B-IV, C-I, D-II

(C) A-II, B-III, C-IV, D-I

(D) A-IV, B-II, C-II, D-III

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42. Which of the following are fused in somatic hybridization involving two varieties of plants?

(A) Callus

(B) Somatic embryos

(C) Protoplasts

(D) Pollens

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43. Spraying sugarcane crop with which of the following plant growth regulators, increases the length of stem, thus, increasing the yield?

(A) Auxin

(B) Gibberellin

(C) Cytokinin

(D) Abscisic acid

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44. Following are the stages of pathway for conduction of an action potential through the heart

A. AV bundle

B. Purkinje fibres

C. AV node

D. Bundle branches

E. SA node

Choose the correct sequence of pathway from the options given below

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

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

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

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

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45. In both sexes of cockroach, a pair of jointed filamentous structures called anal cerci are present on

(A) 5th segment
(B) 10th segment
(C) 8th and 9th segment
(D) 11th segment

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46. The flippers of the Penguins and Dolphins are the example of the

(A) Adaptive radiation
(B) Natural selection
(C) Convergent evolution
(D) Divergent evolution

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47. Which of the following is not a component of Fallopian tube?

(A) Uterine fundus
(B) Isthmus
(C) Infundibulum
(D) Ampulla

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48. Given below are some stages of human evolution.
Arrange them in correct sequence. (Past to Recent)
A. Homo habilis
B. Homo sapiens
C. Homo neanderthalensis
D. Homo erectus
Choose the correct sequence of human evolution from the options given below:

(A) D-A-C-B
(B) B-A-D-C
(C) C-B-D-A
(D) A-D-C-B

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49. Which of the following is not a steroid hormone?

(A) Cortisol
(B) Testosterone
(C) Progesterone
(D) Glucagon

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50. Match List I with List II
List - I | List - II
A. α-1 antitrypsin | I. Cotton bollworm
B. Cry IAb | II. ADA deficiency
C. Cry IAc | III. Emphysema
D. Enzyme replacement therapy | IV. Corn borer
Choose the correct answer form the options given below:

(A) A-II, B-I, C-IV, D-III
(B) A-III, B-I, C-II, D-IV
(C) A-III, B-IV, C-I, D-II
(D) A-II, B-IV, C-I, D-III

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51. Following are the stages of cell division :

A. Gap 2 phase

B. Cytokinesis

C. Synthesis phase

D. Karyokinesis

E. Gap 1 phase

Choose the correct sequence of stages from the options given below :

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

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

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

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

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52. Which one of the following factors will not affect the Hardy-Weinberg equilibrium?

(A) Genetic recombination

(B) Genetic drift

(C) Gene migration

(D) Constant gene pool

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53. Which of the following are Autoimmune disorders?

A. Myasthenia gravis

B. Rheumatoid arthritis

C. Gout

D. Muscular dystrophy

E. Systemic Lupus Erythematosus (SLE)

Choose the most appropriate answer from the options given below:

(A) A, B & D only

(B) A, B & E only

(C) B, C & E only

(D) C, D & E only

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54. Match List I with List II:

List - I | List - II

A. Typhoid | I. Fungus

B. Leishmaniasis | II. Nematode

C. Ringworm | III. Protozoa

D. Filariasis | IV. Bacteria

Choose the correct answer from the options given below:

(A) A-I, B-III, C-II, D-IV

(B) A-IV, B-III, C-I, D-II

(C) A-III, B-I, C-IV, D-II

(D) A-II, B-IV, C-III, D-I

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55. Match List I with List II:

List - I | List - II

A. Expiratory capacity | I. Expiratory reserve volume + Tidal volume + Inspiratory reserve volume

B. Functional residual capacity | II. Tidal volume + Expiratory reserve volume

C. Vital capacity | III. Tidal volume + Inspiratory reserve volume

D. Inspiratory capacity | IV. Expiratory reserve volume + Residual volume

Choose the correct answer from the options given below :

(A) A-II, B-IV, C-I, D-III
(B) A-III, B-II, C-IV, D-I
(C) A-II, B-I, C-IV, D-III
(D) A-I, B-III, C-II, D-IV

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56. Match List I with List II :

List - I | List - II

A. Down's syndrome | I. 11th chromosome

B. α-thalassemia | II. 'X' chromosome

C. β-thalassemia | III. 21st chromosome

D. Klinefelter's syndrome | IV. 16th chromosome

Choose the correct answer from the options given below :

(A) A-I, B-II, C-III, D-IV
(B) A-II, B-III, C-IV, D-I
(C) A-III, B-IV, C-I, D-II
(D) A-IV, B-I, C-II, D-III

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57. Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R:

Assertion A : FSH acts upon ovarian follicles in female and Leydig cells in male.

Reason R : Growing ovarian follicles secrete estrogen in female while interstitial cells secrete androgen in male human being.

In the light of the above statements, choose the correct answer from the options given below :

(A) Both A and R are true and R is the correct explanation of A
(B) Both A and R are true but R is NOT the correct explanation of A
(C) A is true but R is false
(D) A is false but R is true

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58. Match List I with List II:

List - I | List - II

A. Pleurobrachia | I. Mollusca

B. Radula | II. Ctenophora

C. Stomochord | III. Osteichthyes

D. Air bladder | IV. Hemichordata

Choose the correct answer from the options given below :

(A) A-IV, B-II, C-III, D-I
(B) A-II, B-I, C-IV, D-III
(C) A-II, B-IV, C-I, D-III
(D) A-IV, B-III, C-II, D-I

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59. Match List I with List II :

List - I (Sub Phases of Prophase I) | List - II (Specific Characters)

A. Diakinesis | I. Synaptonemal complex formation

B. Pachytene | II. Completion of terminalisation of chiasmata

C. Zygotene | III. Chromosomes look like thin threads

D. Leptotene | IV. Appearance of recombination nodules

Choose the correct answer from the options given below

(A) A-IV, B-II, C-III, D-I

(B) A-I, B-II, C-IV, D-III

(C) A-II, B-IV, C-I, D-III

(D) A-IV, B-III, C-II, D-I

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60. The "Ti plasmid" of Agrobacterium tumefaciens stands for

(A) Tumour inhibiting plasmid

(B) Tumor independent plasmid

(C) Tumor inducing plasmid

(D) Temperature independent plasmid

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61. Match List I with List II:

List - I | List - II

A. Cocaine | I. Effective sedative in surgery

B. Heroin | II. Cannabis sativa

C. Morphine | III. Erythroxylum

D. Marijuana | IV. Papaver somniferum

Choose the correct answer from the options given below:

(A) A-IV, B-III, C-I, D-II

(B) A-I, B-III, C-II, D-IV

(C) A-II, B-I, C-III, D-IV

(D) A-III, B-IV, C-I, D-II

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62. Which one is the correct product of DNA dependent RNA polymerase to the given template?

3′TACATGGCAAATATCCATTCA5′

(A) 5′AUGUACCGUUUAUAGGUAAGU3′

(B) 5′AUGUAAAGUUUAUAGGUAAGU3′

(C) 5′AUGUACCGUUUAUAGGGAAGU3′

(D) 5′ATGTACCGTTTATAGGTAAGT3′

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63. Match List I with List II:

List - I | List - II

A. Pons | I. Provides additional space for Neurons, regulates posture and balance.

B. Hypothalamus | II. Controls respiration and gastric secretions.

C. Medulla | III. Connects different regions of the brain.

D. Cerebellum | IV. Neuro secretory cells

Choose the correct answer from the options given below :

(A) A-II, B-III, C-I, D-IV

(B) A-III, B-IV, C-II, D-I

(C) A-I, B-III, C-II, D-IV

(D) A-II, B-I, C-III, D-IV

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64. Match List I with List II:

List - I | List - II

A. Lipase | I. Peptide bond

B. Nuclease | II. Ester bond

C. Protease | III. Glycosidic bond

D. Amylase | IV. Phosphodiester bond

Choose the correct answer from the options given below :

(A) A-IV, B-II, C-III, D-I

(B) A-III, B-II, C-I, D-IV

(C) A-II, B-IV, C-I, D-III

(D) A-IV, B-I, C-III, D-II

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65. Which of the following is not a natural/traditional contraceptive method?

(A) Coitus interruptus

(B) Periodic abstinence

(C) Lactational amenorrhea

(D) Vaults

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66. Which of the following statements is incorrect?

(A) A bio-reactor provides optimal growth conditions for achieving the desired product

(B) Most commonly used bio-reactors are of stirring type

(C) Bio-reactors are used to produce small scale bacterial cultures

(D) Bio-reactors have an agitator system, an oxygen delivery system and foam control system

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67. Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R:

Assertion A : Breast-feeding during initial period of infant growth is recommended by doctors for bringing a healthy baby.

Reason R : Colostrum contains several antibodies absolutely essential to develop resistance for the new born baby.

In the light of the above statements, choose the most appropriate answer from the options given below:

(A) Both A and R are correct and R is the correct explanation of A

(B) Both A and R are correct but R is NOT the correct explanation of A

(C) A is correct but R is not correct

(D) A is not correct but R is correct

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68. Which of the following factors are favourable for the formation of oxyhaemoglobin in alveoli?

(A) High pO_2 and High pCO_2

(B) High pO_2 and Lesser H^+ concentration

(C) Low pCO_2 and High H^+ concentration

(D) Low pCO_2 and High temperature

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69. Match List I with List II :

List - I | List - II

A. Common cold | I. Plasmodium

B. Haemozoin | II. Typhoid

C. Widal test | III. Rhinoviruses

D. Allergy | IV. Dust mites

Choose the correct answer from the options given below :

(A) A-III, B-IV, C-III, D-I

(B) A-I, B-III, C-II, D-IV

(C) A-III, B-I, C-II, D-IV

(D) A-IV, B-II, C-III, D-I

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70. Consider the following statements :

A. Annelids are true coelomates

B. Poriferans are pseudocoelomates

C. Aschelminthes are acoelomates

D. Platyhelminthes are pseudocoelomates

Choose the correct answer from the options given below :

(A) B only

(B) A only

(C) C only

(D) D only

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71. Match List I with List II

List - I | List - II

A. Non-medicated IUD | I. Multiload 375

B. Copper releasing IUD | II. Progestogens

C. Hormone releasing IUD | III. Lippes loop

D. Implants | IV. LNG-20

Choose the correct answer from the options given below:

(A) A-III, B-I, C-II, D-IV

(B) A-I, B-III, C-IV, D-II

(C) A-IV, B-I, C-II, D-III

(D) A-III, B-I, C-IV, D-II

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72. Given below are two statements :

Statement I : In the nephron, the descending limb of loop of Henle is impermeable to water and permeable to electrolytes.

Statement II : The proximal convoluted tubule is lined by simple columnar brush border epithelium and increases the surface area for reabsorption.

In the light of the above statements, choose the correct answer from the options given below :

(A) Both Statement I and Statement II are true

(B) Both Statement I and Statement II are false

(C) Statement I is true but Statement II is false

(D) Statement I is false but Statement II is true

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73. Match List I with List II :

List - I | List - II

A. Axoneme | I. Centriole

B. Cartwheel pattern | II. Cilia and flagella

C. Crista | III. Chromosome

D. Satellite | IV. Mitochondria

Choose the correct answer from the options given below :

(A) A-IV, B-III, C-II, D-I

(B) A-IV, B-II, C-III, D-I

(C) A-II, B-IV, C-I, D-III

(D) A-II, B-I, C-IV, D-III

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74. Match List I with List II :

List - I | List - II

A. Pterophyllum | I. Hag fish

B. Myxine | II. Saw fish

C. Pristis | III. Angel fish

D. Exocoetus | IV. Flying fish

Choose the correct answer from the options given below :

(A) A-II, B-I, C-III, D-IV

(B) A-III, B-I, C-II, D-IV

(C) A-IV, B-I, C-II, D-III

(D) A-III, B-II, C-I, D-IV

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75. Match List I with List II :

List - I | List - II

A. Fibrous joints | I. Adjacent vertebrae, limited movement

B. Cartilaginous joints | II. Humerus and Pectoral girdle, rotational movement

C. Hinge joints | III. Skull, don't allow any movement

D. Ball and socket joints | IV. Knee, help in locomotion

Choose the correct answer from the options given below :

(A) A-IV, B-II, C-III, D-I

(B) A-I, B-III, C-II, D-IV

(C) A-II, B-III, C-I, D-IV

(D) A-III, B-I, C-IV, D-II

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76. Given below are two statements:

Statement I: The presence or absence of hymen is not a reliable indicator of virginity.

Statement II: The hymen is torn during the first coitus only.

In the light of the above statements, choose the correct answer from the options given below :

(A) Both Statement I and Statement II are true

(B) Both Statement I and Statement II are false

(C) Statement I is true but Statement II is false

(D) Statement I is false but Statement II is true

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77. Given below are two statements:

Statement I: Gause's competitive exclusion principle states that two closely related species competing for different resources cannot exist indefinitely.

Statement II: According to Gause's principle, during competition, the inferior will be eliminated. This may be true if resources are limiting.

In the light of the above statements, choose the correct answer from the options given below :

(A) Both Statement I and Statement II are true.
(B) Both Statement I and Statement II are false.
(C) Statement I is true but Statement II is false.
(D) Statement I is false but Statement II is true.

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78. Match List I with List II related to digestive system of cockroach.

List - I | List - II

A. The structures used for storing of food | I. Gizzard

B. Ring of 6-8 blind tubules at junction of foregut and midgut. | II. Gastric Caeca

C. Ring of 100-150 yellow coloured thin filaments at junction of midgut and hindgut. | III. Malpighian tubules

D. The structures used for grinding the food. | IV. Crop

Choose the correct answer from the options given below:

(A) A-IV, B-II, C-III, D-I
(B) A-I, B-II, C-III, D-IV
(C) A-IV, B-III, C-II, D-I
(D) A-III, B-II, C-IV, D-I

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79. The following are the statements about non-chordates:

A. Pharynx is perforated by gill slits.

B. Notochord is absent.

C. Central nervous system is dorsal.

D. Heart is dorsal if present.

E. Post anal tail is absent.

Choose the most appropriate answer from the options given below:

(A) A & C only
(B) A, B & D only
(C) B, D & E only
(D) B, C & D only

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80. Choose the correct statement given below regarding juxta medullary nephron.

(A) Juxta medullary nephrons are located in the columns of Bertini.
(B) Renal corpuscle of juxta medullary nephron lies in the outer portion of the renal medulla.
(C) Loop of Henle of juxta medullary nephron runs deep into medulla.
(D) Juxta medullary nephrons outnumber the cortical nephrons.

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81. Given below are two statements:
Statement I: The cerebral hemispheres are connected by nerve tract known as corpus callosum.
Statement II: The brain stem consists of the medulla oblongata, pons and cerebrum.
In the light of the above statements, choose the most appropriate answer from the options given below:

(A) Both Statement I and Statement II are correct.
(B) Both Statement I and Statement II are incorrect.
(C) Statement I is correct but Statement II is incorrect.
(D) Statement I is incorrect but Statement II is correct.

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82. Given below are two statements :
Statement I : Bone marrow is the main lymphoid organ where all blood cells including lymphocytes are produced.
Statement II : Both bone marrow and thymus provide micro environments for the development and maturation of T-lymphocytes.
In the light of above statements, choose the most appropriate answer from the options given below

(A) Both Statement I and Statement II are correct.
(B) Both Statement I and Statement II are incorrect.
(C) Statement I is correct but Statement II is incorrect.
(D) Statement I is incorrect but Statement II is correct.

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83. Regarding catalytic cycle of an enzyme action, select the correct sequential steps :
A. Substrate enzyme complex formation.
B. Free enzyme ready to bind with another substrate.
C. Release of products.
D. Chemical bonds of the substrate broken.
E. Substrate binding to active site.
Choose the correct answer from the options given below :

(A) E, A, D, C, B
(B) A, E, B, D, C
(C) B, A, C, D, E
(D) E, D, C, B, A

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84. Identify the correct option (A), (B), (C), (D) with respect to spermatogenesis.
GnRH → LH → (B) → Androgens → Formation of separmatids
GnRH → (A) → (C) → Factors → (D)

(A) FSH, Leydig cells, Sertoli cells, spermiogenesis.
(B) ICSH, Interstitial cells, Leydig cells, spermiogenesis.
(C) FSH, Sertoli cells, Leydig cells, spermatogenesis.
(D) ICSH, Leydig cells, Sertoli cells, spermatogenesis.

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85. Match List I with List II:

List - I | List - II

A. Mesozoic Era | I. Lower invertebrates

B. Proterozoic Era | II. Fish & Amphibia

C. Cenozoic Era | III. Birds & Reptiles

D. Paleozoic Era | IV. Mammals

Choose the correct answer from the options given below :

(A) A-II, B-I, C-III, D-IV

(B) A-III, B-I, C-II, D-IV

(C) A-I, B-II, C-IV, D-III

(D) A-III, B-I, C-IV, D-II

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86. Match List I with List II:

List - I | List - II

A. Unicellular glandular epithelium | I. Salivary glands

B. Compound epithelium | II. Pancreas

C. Multicellular glandular epithelium | III. Goblet cells of alimentary canal

D. Endocrine glandular epithelium | IV. Moist surface of buccal cavity

Choose the correct answer from the options given below:

(A) A-II, B-I, C-III, D-IV

(B) A-IV, B-III, C-I, D-II

(C) A-III, B-IV, C-I, D-II

(D) A-II, B-I, C-IV, D-III

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87. Match List I with List II:

List - I | List - II

A. RNA polymerase III | I. snRNPs

B. Termination of transcription | II. Promotor

C. Splicing of Exons | III. Rho factor

D. TATA box | IV. SnRNAs, tRNA

Choose the correct answer from the options given below :

(A) A-II, B-IV, C-I, D-III

(B) A-III, B-II, C-IV, D-I

(C) A-III, B-IV, C-I, D-II

(D) A-IV, B-III, C-I, D-II

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88. Match List I with List II :

List - I | List - II

A. P wave | (i) Heart muscles are electrically silent.

B. QRS complex | (ii) Depolarisation of ventricles.

C. T wave | (iii) Depolarisation of atria.

D. T-P gap | (iv) Repolarisation of ventricles.

Choose the correct answer from the options given below :

(A) A-I, B-III, C-IV, D-II

(B) A-III, B-II, C-IV, D-I

(C) A-II, B-III, C-I, D-IV

(D) A-IV, B-II, C-I, D-III

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89. Match List I with List II :

List - I | List - II

A. Exophthalmic goiter | I. Excess secretion of cortisol, moon face & hyperglycemia.

B. Acromegaly | II. Hypo-secretion of thyroid hormone and stunted growth.

C. Cushing's syndrome | III. Hyper secretion of thyroid hormone & protruding eye balls.

D. Cretinism | IV. Excessive secretion of growth hormone.

Choose the correct answer from the options given below :

(A) A-I, B-III, C-II, D-IV
(B) A-IV, B-II, C-I, D-III
(C) A-III, B-IV, C-II, D-I
(D) A-III, B-IV, C-I, D-II

Answer key and explanations

1. Answer: (B) Phospholipids

Lecithin is a phosphatidylcholine: glycerol esterified with two fatty acids and a phosphate group carrying choline, which makes it a phospholipid found in cell membranes. It is not a simple glyceride because of the phosphorylated head group, and it is neither an amino acid nor a carbohydrate.

2. Answer: (D) 3 molecules of ATP and 2 molecules of NADPH

Fixing one CO_2 in the Calvin cycle needs 2 ATP and 2 NADPH for reduction of 3-PGA plus 1 more ATP to regenerate RuBP, i.e. 3 ATP and 2 NADPH. Producing one glucose (6 CO_2) therefore needs 18 ATP and 12 NADPH.

3. Answer: (B) 6 bp

Hind II, the first restriction endonuclease isolated, always cuts DNA at a specific recognition sequence six base pairs long. Many other restriction enzymes recognise palindromes of different lengths, but for Hind II it is 6 bp.

4. Answer: (A) Zinc

Carboxypeptidase is a metalloenzyme whose prosthetic cofactor is the zinc ion. Haem is the prosthetic group of peroxidase and catalase, while niacin and flavin are parts of coenzymes such as NAD and FAD.

5. Answer: (A) Totipotency

Totipotency is the capacity of a single plant cell or explant to regenerate an entire plant, which is the basis of plant tissue culture. Micropropagation is the technique that exploits this capacity, not the capacity itself, and differentiation is only maturation of cells.

6. Answer: (A) A-III, B-II, C-IV, D-I

Rhizopus is the bread mould, Ustilago causes smut, Puccinia causes rust and Agaricus is a mushroom. So the correct pairing is Rhizopus-bread mould, Ustilago-smut fungus, Puccinia-rust fungus, Agaricus-mushroom.

7. Answer: (C) Statement I is true but Statement II is false

Bt toxins are insect-group specific and the cry IAc gene codes one such toxin that controls cotton bollworms, so Statement I is accepted as true. Statement II is false because the inactive protoxin is converted to the active toxin by the alkaline pH of the insect gut, not an acidic pH.

8. Answer: (A) Datura

Datura (like mustard and chilli) has radially symmetrical, actinomorphic flowers that can be divided into equal halves through any radial plane. Cassia, Pisum and Sesbania belong to the pea/cassia families and have zygomorphic flowers.

9. Answer: (D) B, C, D and E only

Water-pollinated flowers such as Vallisneria are not colourful and produce no nectar, so the first statement is wrong. Water lily is insect/wind pollinated even though it is aquatic; pollen of water-pollinated plants is protected by a mucilaginous covering; sea grasses have long ribbon-like pollen; and in some hydrophytes pollen is carried passively inside water. Thus all statements except the one on Vallisneria are correct.

10. Answer: (C) Permease

In the lac operon the y gene codes permease, which increases the permeability of the cell to β-galactosides and transports lactose into the cell. β-galactosidase (z gene) hydrolyses lactose, and transacetylase (a gene) is the third product.

11. Answer: (C) A-III, B-I, C-IV, D-II

Clostridium butylicum produces butyric acid, Saccharomyces cerevisiae is used for ethanol, Trichoderma polysporum yields the immunosuppressant cyclosporin A, and Streptococcus gives streptokinase, the clot buster. Hence butyric acid, ethanol, cyclosporin-A and streptokinase in that order.

12. Answer: (C) Carrying capacity

In the logistic equation $dN/dt = rN[(K - N)/K]$, r is the intrinsic rate of natural increase and K is the carrying capacity, the maximum population the environment can support. As N approaches K the growth rate falls to zero.

13. Answer: (C) does not affect mature monocotyledonous plants.

Synthetic auxins such as 2,4-D act as herbicides against broad-leaved dicot weeds but do not affect mature monocotyledonous plants, so grasses in a lawn are spared. Promotion of apical dominance or of abscission does not explain why only the weeds are killed.

14. Answer: (D) Statement I is false but Statement II is true

Both parenchyma and collenchyma are living tissues (sclerenchyma is the dead simple tissue), so Statement I is false. Gymnosperms lack vessels in their xylem, whereas vessels are a characteristic feature of angiosperms, so Statement II is true.

15. Answer: (D) A, B and D only

The 'Evil Quartet' of causes of biodiversity loss is habitat loss and fragmentation, over-exploitation, alien species invasions and co-extinctions. Mutation and migration are not counted among them, so the set is over-exploitation, co-extinction and habitat loss.

16. Answer: (B) Mode of nutrition

Fungi are classified on the basis of the morphology of the mycelium, the mode of spore formation and the type of fruiting bodies. The mode of nutrition is not used, because nearly all fungi are heterotrophic (saprophytic or parasitic).

17. Answer: (D) IUCN

The IUCN (International Union for Conservation of Nature) publishes the Red List of threatened and endangered species. GEAC is an Indian body that approves GM organisms, and WWF is a conservation NGO, not the Red List authority.

18. Answer: (C) B and C only

A piece of DNA carrying only the gene of interest has no origin of replication, so it cannot multiply on its own; it can multiply only if it integrates into the recipient genome and is then replicated and inherited along with host DNA. Independent replication and an ability to replicate on its own are therefore wrong.

19. Answer: (B) A, C, D and E only

The law of dominance explains that characters are controlled by discrete units called factors, that factors occur in pairs, and that in a dissimilar pair one is dominant and the other recessive, so only one parental character is expressed in a monohybrid F_1. The statement that both characters appear unchanged in F_2 without expression is not part of this law.

20. Answer: (C) Competitive inhibition

Malonate closely resembles succinate in structure and competes with it for the active site of succinic dehydrogenase, which is classical competitive inhibition. Feedback inhibition is inhibition by an end product at a different site, which is not the case here.

21. Answer: (C) Dedifferentiation

Living differentiated cells that have lost the capacity to divide can regain it; this is dedifferentiation. Interfascicular cambium (and cork cambium) arises in this way from mature parenchyma cells, while redifferentiation is the later step in which the products of such meristems mature again.

22. Answer: (A) A, C, D and E only

Tropics have been relatively undisturbed for millions of years, have more solar energy for productivity, and are less seasonal, more constant and predictable, which promotes niche specialisation. The statement that tropical environments are more seasonal is false, so the correct set excludes it.

23. Answer: (A) Both Statement I and Statement II are true

During leptotene chromosomes become gradually visible under the light microscope, and the beginning of diplotene is recognised by dissolution of the synaptonemal complex while homologues remain joined at chiasmata. Both statements are true.

24. Answer: (A) A-III, B-II, C-IV, D-I

The nucleolus is the site of active rRNA synthesis, the centriole has a cartwheel organisation of nine peripheral triplet fibrils, leucoplasts store nutrients such as starch, oils and proteins, and the Golgi apparatus is the site of glycoprotein and glycolipid formation.

25. Answer: (A) Inward curling of leaves in monocots.

Bulliform cells are large, empty, colourless cells in the upper epidermis of grass leaves. When they lose turgor under water stress the leaf rolls inward, reducing water loss; they do not store sugars or protect against salt.

26. Answer: (B) Red flowered as well as pink flowered plants

Flower colour in snapdragon shows incomplete dominance: red is RR, pink is Rr. Crossing pink (Rr) with red (RR) gives RR and Rr in a 1:1 ratio, i.e. red and pink flowered plants; white (rr) cannot arise because the red parent gives only R.

27. Answer: (D) Promotor, Structural gene, Terminator

A transcription unit is defined by a promoter at the upstream end, the structural gene in the middle and a terminator at the downstream end. Repressor, operator and inducer are elements of operon regulation, not of the basic transcription unit.

28. Answer: (B) bb

To find whether a dominant phenotype is BB or Bb, it is crossed with the homozygous recessive bb (a test cross). All black progeny means the plant is BB, while a 1:1 black:white ratio means it is Bb.

29. Answer: (C) C, D and E only

The biosynthetic (dark) phase uses CO_2 together with ATP and NADPH produced in the light reaction. Light and chlorophyll are needed only for the light reaction, not directly for the Calvin cycle.

30. Answer: (C) A-III, B-IV, C-I, D-II

Alternative forms of a gene are alleles; crossing F_1 with the homozygous recessive parent is a test cross; crossing F_1 with either parent is a back cross; and the number of chromosome sets is ploidy.

31. Answer: (B) Circular, double stranded

Chloroplasts, like mitochondria, contain their own small, circular, double-stranded DNA molecule together with 70S ribosomes, a feature similar to prokaryotes. They do not contain linear or single-stranded DNA.

32. Answer: (B) A-III, B-I, C-IV, D-II

Robert May estimated global species diversity at about 7 million, Alexander von Humboldt described the species-area relationship, Paul Ehrlich proposed the rivet popper hypothesis, and David Tilman ran long-term ecosystem experiments using outdoor plots.

33. Answer: (A) A-II, B-IV, C-I, D-III

Rose has perigynous flowers, pea has marginal placentation, cotton (like China rose) shows twisted aestivation and mango fruit is a drupe.

34. Answer: (D) The DNA dependent DNA polymerase catalyses polymerization in 5′ → 3′ direction

DNA-dependent DNA polymerases can add nucleotides only to a free 3′-OH, so they catalyse polymerisation only in the 5′ → 3′ direction; this is why one strand is synthesised discontinuously. RNA polymerase is not the replication enzyme, and DNA polymerase does not polymerise 3′ → 5′.

35. Answer: (B) A-II, B-I, C-IV, D-III

The citric acid cycle occurs in the mitochondrial matrix, glycolysis in the cytoplasm, the electron transport system is located in the inner mitochondrial membrane, and the proton gradient is built up in the intermembrane space.

36. Answer: (C) A, C, D and E only

In brown algae asexual reproduction is by biflagellate zoospores, food is stored as mannitol or laminarin, pigments are chlorophyll a and c with carotenoids and fucoxanthin, and the cellulosic wall is covered by algin. Sexual reproduction may be isogamous, anisogamous or oogamous, so 'oogamous only' is wrong.

37. Answer: (A) A-IV, B-I, C-II, D-III

GLUT-4 is the transporter that enables glucose transport into cells, insulin is a hormone, trypsin is an enzyme and collagen is an intercellular ground substance protein.

38. Answer: (C) Succinyl-CoA → Succinic acid

Conversion of succinyl-CoA to succinic acid releases energy used for substrate-level phosphorylation (GTP/ATP) without removal of hydrogen, so there is no oxidation. Isocitrate → α-ketoglutarate, succinate → fumarate/malate route and malate → oxaloacetate are all dehydrogenations (oxidations).

39. Answer: (C) Statement I is true but Statement II is false

In C_3 plants RuBisCO also binds O_2 (photorespiration), so some RuBP is wasted and CO_2 fixation decreases; Statement I is true. In C_4 plants mesophyll cells lack RuBisCO and so do not photorespire, while bundle sheath cells have RuBisCO but high CO_2 there minimises photorespiration, so Statement II reverses the facts and is false.

40. Answer: (A) A-IV, B-II, C-I, D-III

Stamens united into one bundle (monoadelphous) occur in China rose, two bundles (diadelphous) in pea, more than two bundles (polyadelphous) in citrus, and stamens attached to the perianth (epiphyllous) in lily.

41. Answer: (B) A-III, B-IV, C-I, D-II

Griffith discovered transformation, Jacob and Monod proposed the lac operon, Har Gobind Khorana helped decipher the genetic code, and Meselson and Stahl proved semi-conservative DNA replication.

42. Answer: (C) Protoplasts

In somatic hybridisation the cell walls are digested away and the naked protoplasts of two different varieties or species are fused to give hybrid protoplasts, which are then grown into somatic hybrids (e.g. pomato). Callus, somatic embryos and pollen are not what is fused.

43. Answer: (B) Gibberellin

Gibberellins cause internode elongation; spraying sugarcane with GA increases stem length and therefore yield by as much as 20 tonnes per acre. Auxin, cytokinin and abscisic acid are not used this way.

44. Answer: (A) E-C-A-D-B

The impulse starts at the SA node, passes to the AV node, then along the AV bundle (bundle of His), into the right and left bundle branches and finally the Purkinje fibres. So SA node → AV node → AV bundle → bundle branches → Purkinje fibres.

45. Answer: (B) 10th segment

In both sexes of cockroach a pair of jointed filamentous anal cerci arises from the 10th abdominal segment. Anal styles, by contrast, are present only in males on the 9th segment.

46. Answer: (C) Convergent evolution

Flippers of penguins (birds) and dolphins (mammals) are analogous structures: similar form and function evolved independently in unrelated groups adapting to the same aquatic habitat, which is convergent evolution. Divergent evolution produces homologous structures from a common ancestor.

47. Answer: (A) Uterine fundus

The fallopian tube consists of the funnel-shaped infundibulum with fimbriae, the wider ampulla and the narrow isthmus that joins the uterus. The fundus is the dome-shaped upper part of the uterus itself, not of the tube.

48. Answer: (D) A-D-C-B

Homo habilis (about 2 million years ago) came first, followed by Homo erectus (about 1.5 million years ago), then Neanderthal man (about 1,00,000-40,000 years ago) and finally Homo sapiens. So habilis → erectus → neanderthalensis → sapiens.

49. Answer: (D) Glucagon

Cortisol, testosterone and progesterone are steroid hormones derived from cholesterol. Glucagon from the α-cells of the pancreas is a peptide hormone.

50. Answer: (C) A-III, B-IV, C-I, D-II

Human α-1 antitrypsin made by transgenic animals is used to treat emphysema, cry IAb codes a toxin that controls corn borer, cry IAc controls cotton bollworms, and enzyme replacement therapy is used for ADA deficiency.

51. Answer: (D) E-C-A-D-B

Interphase runs G_1 → S → G_2, and is followed by M phase, in which karyokinesis (nuclear division) precedes cytokinesis. So Gap 1 → Synthesis → Gap 2 → Karyokinesis → Cytokinesis.

52. Answer: (D) Constant gene pool

Hardy-Weinberg equilibrium is disturbed by gene migration (gene flow), genetic drift, mutation, genetic recombination and natural selection. A constant gene pool is the very condition of equilibrium, so it does not disturb it.

53. Answer: (B) A, B & E only

Myasthenia gravis, rheumatoid arthritis and systemic lupus erythematosus are autoimmune diseases in which the body attacks its own tissues. Gout is caused by uric acid crystal deposition, and muscular dystrophy is a genetic degenerative disorder.

54. Answer: (B) A-IV, B-III, C-I, D-II

Typhoid is caused by the bacterium Salmonella typhi, leishmaniasis by a protozoan (Leishmania), ringworm by fungi (e.g. Microsporum, Trichophyton) and filariasis by the nematode Wuchereria.

55. Answer: (A) A-II, B-IV, C-I, D-III

Expiratory capacity = TV + ERV; functional residual capacity = ERV + RV; vital capacity = ERV + TV + IRV; inspiratory capacity = TV + IRV.

56. Answer: (C) A-III, B-IV, C-I, D-II

Down's syndrome is trisomy of chromosome 21, α-thalassemia is controlled by genes on chromosome 16, β-thalassemia by the HBB gene on chromosome 11, and Klinefelter's syndrome involves an extra X chromosome (XXY).

57. Answer: (D) A is false but R is true

In males FSH acts on the Sertoli cells, while LH (ICSH) acts on the Leydig cells, so the Assertion is false. The Reason is true: growing ovarian follicles secrete oestrogen and interstitial (Leydig) cells secrete androgens.

58. Answer: (B) A-II, B-I, C-IV, D-III

Pleurobrachia is a ctenophore, the radula is the rasping feeding organ of molluscs, the stomochord is the notochord-like structure of hemichordates, and the air bladder is found in bony fishes (Osteichthyes).

59. Answer: (C) A-II, B-IV, C-I, D-III

Diakinesis is marked by completion of terminalisation of chiasmata, pachytene by appearance of recombination nodules, zygotene by formation of the synaptonemal complex, and in leptotene chromosomes look like thin threads.

60. Answer: (C) Tumor inducing plasmid

Ti stands for tumour inducing: this plasmid of Agrobacterium tumefaciens transfers T-DNA into dicot plant cells and causes crown gall tumours. Disarmed Ti plasmids are used as cloning vectors.

61. Answer: (D) A-III, B-IV, C-I, D-II

Cocaine comes from Erythroxylum coca, heroin is derived (by acetylation) from morphine obtained from the poppy Papaver somniferum, morphine is an effective sedative and painkiller used in surgery, and marijuana comes from Cannabis sativa.

62. Answer: (A) 5′AUGUACCGUUUAUAGGUAAGU3′

RNA is complementary and antiparallel to the template, with U pairing opposite A: 3′TACATGGCAAATATCCATTCA5′ gives 5′AUGUACCGUUUAUAGGUAAGU3′. The sequence with T in place of U is DNA, and the other two contain mismatched bases.

63. Answer: (B) A-III, B-IV, C-II, D-I

Pons consists of fibre tracts that interconnect different regions of the brain, the hypothalamus contains neurosecretory cells, the medulla controls respiration and gastric secretions, and the cerebellum provides additional space for neurons and regulates posture and balance.

64. Answer: (C) A-II, B-IV, C-I, D-III

Lipases hydrolyse ester bonds of fats, nucleases break phosphodiester bonds of nucleic acids, proteases break peptide bonds, and amylase breaks glycosidic bonds of starch.

65. Answer: (D) Vaults

Coitus interruptus, periodic abstinence and lactational amenorrhoea are natural methods that need no device. Vaults are rubber barrier devices placed over the cervix, so they are not a natural method.

66. Answer: (C) Bio-reactors are used to produce small scale bacterial cultures

Bioreactors are large vessels (100-1000 litres) used for large-scale production of cultures and products; small-scale cultures are grown in flasks. Bioreactors do provide optimal conditions, are commonly of the stirring type, and include agitator, oxygen delivery and foam control systems.

67. Answer: (A) Both A and R are correct and R is the correct explanation of A

Breast-feeding in the initial period is recommended because the colostrum secreted in the first few days contains several antibodies (IgA) essential for developing resistance in the newborn. Both statements are correct and the Reason explains the Assertion.

68. Answer: (B) High pO_2 and Lesser H^+ concentration

In the alveoli high pO_2, low pCO_2, lower H^+ concentration (higher pH) and lower temperature favour binding of O_2 to haemoglobin. High pCO_2, high H^+ and high temperature favour dissociation of oxyhaemoglobin, as in tissues.

69. Answer: (C) A-III, B-I, C-II, D-IV

Common cold is caused by rhinoviruses, haemozoin is the toxin released by Plasmodium in malaria, the Widal test confirms typhoid, and dust mites are common allergens.

70. Answer: (B) A only

Annelids are true coelomates (eucoelomates). Poriferans have no coelom at all, aschelminthes are pseudocoelomates and platyhelminthes are acoelomates, so only the annelid statement is correct.

71. Answer: (D) A-III, B-I, C-IV, D-II

Lippes loop is a non-medicated IUD, Multiload 375 is a copper-releasing IUD, LNG-20 is a hormone-releasing IUD, and implants contain progestogens (alone or with oestrogen).

72. Answer: (B) Both Statement I and Statement II are false

The descending limb of Henle's loop is permeable to water but almost impermeable to electrolytes, so Statement I is false. The PCT is lined by simple cuboidal (not columnar) brush border epithelium, so Statement II as worded is also false.

73. Answer: (D) A-II, B-I, C-IV, D-III

The axoneme is the core of cilia and flagella, the cartwheel pattern is seen in centrioles, cristae are infoldings of the inner mitochondrial membrane, and a satellite is the small fragment beyond the secondary constriction of some chromosomes.

74. Answer: (B) A-III, B-I, C-II, D-IV

Pterophyllum is the angel fish, Myxine the hag fish, Pristis the saw fish and Exocoetus the flying fish.

75. Answer: (D) A-III, B-I, C-IV, D-II

Fibrous joints, as between skull bones, allow no movement; cartilaginous joints, as between adjacent vertebrae, allow limited movement; the knee is a hinge joint; and the joint between humerus and pectoral girdle is a ball and socket joint allowing rotation.

76. Answer: (C) Statement I is true but Statement II is false

The hymen can be torn by a sudden fall or jolt, insertion of a tampon, or active sports such as horse riding or cycling, and in some women it persists even after coitus. Hence its presence or absence is not a reliable indicator of virginity, and the claim that it is torn only during first coitus is false.

77. Answer: (D) Statement I is false but Statement II is true.

Gause's competitive exclusion principle states that two closely related species competing for the same resources cannot coexist indefinitely; saying 'different resources' makes Statement I false. Statement II is true: the competitively inferior species is eliminated, which may hold when resources are limiting.

78. Answer: (A) A-IV, B-II, C-III, D-I

In cockroach the crop stores food, a ring of 6-8 blind gastric caeca lies at the junction of foregut and midgut, a ring of 100-150 yellow Malpighian tubules lies at the junction of midgut and hindgut, and the gizzard grinds the food.

79. Answer: (C) B, D & E only

Non-chordates have no notochord, have a dorsal heart (if present), and lack a post-anal tail. Their CNS is ventral, solid and double, and the pharynx is not perforated by gill slits, which are chordate features.

80. Answer: (C) Loop of Henle of juxta medullary nephron runs deep into medulla.

In juxta medullary nephrons the loop of Henle is very long and runs deep into the medulla. Their renal corpuscles lie in the inner cortex near the medulla, they are fewer than cortical nephrons, and the columns of Bertini are cortical extensions between medullary pyramids.

81. Answer: (C) Statement I is correct but Statement II is incorrect.

The two cerebral hemispheres are connected by the corpus callosum, so Statement I is correct. The brain stem consists of the midbrain, pons and medulla oblongata; the cerebrum is part of the forebrain, so Statement II is incorrect.

82. Answer: (A) Both Statement I and Statement II are correct.

Bone marrow is the main lymphoid organ where all blood cells including lymphocytes are produced. Bone marrow and thymus together provide micro-environments for the development and maturation of T-lymphocytes, so both statements are correct.

83. Answer: (A) E, A, D, C, B

The substrate first binds the active site, forming an enzyme-substrate complex; the bonds of the substrate are then broken, the products are released, and the free enzyme is ready to bind another substrate. That gives binding → complex → bond breaking → release → free enzyme.

84. Answer: (A) FSH, Leydig cells, Sertoli cells, spermiogenesis.

GnRH stimulates the pituitary to release LH and FSH. LH acts on Leydig cells to stimulate androgen secretion, which drives spermatogenesis, while FSH acts on Sertoli cells, whose factors support spermiogenesis. So the blanks are FSH, Leydig cells, Sertoli cells and spermiogenesis.

85. Answer: (D) A-III, B-I, C-IV, D-II

The Mesozoic era is the age of reptiles and birds, the Proterozoic era had only lower invertebrates, the Cenozoic is the age of mammals, and the Paleozoic saw the rise of fishes and amphibians.

86. Answer: (C) A-III, B-IV, C-I, D-II

Goblet cells of the alimentary canal are unicellular glandular epithelium, compound epithelium covers the moist surface of the buccal cavity, salivary glands are multicellular glands, and the pancreas has endocrine glandular epithelium (islets).

87. Answer: (D) A-IV, B-III, C-I, D-II

RNA polymerase III transcribes tRNA, 5S rRNA and snRNAs; termination of transcription in bacteria involves the rho factor; splicing of exons is done by snRNPs (spliceosome); and the TATA box lies in the promoter.

88. Answer: (B) A-III, B-II, C-IV, D-I

The P wave represents depolarisation of the atria, the QRS complex depolarisation of the ventricles, the T wave repolarisation of the ventricles, and during the T-P gap the heart muscle is electrically silent.

89. Answer: (D) A-III, B-IV, C-I, D-II

Exophthalmic goitre (Graves' disease) results from hyper-secretion of thyroid hormone with protruding eyeballs; acromegaly from excess growth hormone in adults; Cushing's syndrome from excess cortisol with moon face and hyperglycaemia; and cretinism from hypo-secretion of thyroid hormone with stunted growth.

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.