NEET 2024 Re-exam — Biology Question Paper with Solutions

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

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1. The regions with high level of species richness, high degree of endemism and a loss of 70% of the species and habitat are identified as:

(A) Natural Reserves
(B) Sacred Groves
(C) Biodiversity Hotspots
(D) Biogeographical Regions

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2. Which of the following simple tissues are commonly found in the fruit walls of nuts and pulp of pear?

(A) Sclereids
(B) Fibres
(C) Parenchyma
(D) Collenchyma

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3. In a chromosome, there is a specific DNA sequence, responsible for initiating replication. It is called as:

(A) Recognition sequence
(B) Cloning site
(C) Restriction site
(D) ori site

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4. Given below are two statements:
Statement I: When many alleles of a single gene govern a character, it is called polygenic inheritance.
Statement II: In Polygenic inheritance, the effect of each allele is additive.
In the light of the above statements, choose the correct answer from the options given below.

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

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5. Which of the following are required for the light reaction of Photosynthesis?
A. CO_2
B. O_2
C. H_2O
D. Chlorophyll
E. Light
Choose the correct answer from the options given below:

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

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6. Match List I with List II :

List-I – List-II

(A) Flemming – (I) Disc shaped sacs or cisternae near cell nucleus

(B) Robert Brown – (II) Chromatin

(C) George Palade – (III) Ribosomes

(D) Camillo Golgi – (IV) Nucleus

Choose the correct answer from the options given below:

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

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

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

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

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7. Match List-I with List-II:

List-I (Type of Inheritance) – List-II (Example)

(A) Incomplete dominance – (I) Blood groups in human

(B) Co-dominance – (II) Flower colour in Antirrhinum

(C) Pleiotropy – (III) Skin colour in human

(D) Polygenic inheritance – (IV) Phenylketonuria

Choose the correct answer from the options given below:

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

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

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

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

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8. Which part of the ovule stores reserve food materials?

(A) Nucellus

(B) Integument

(C) Placenta

(D) Funicle

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9. Which one of the following is not found in Gymnosperms?

(A) Sieve cells

(B) Albuminous cells

(C) Tracheids

(D) Vessels

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10. Which one of the following is not included under in-situ conservation?

(A) Wild-life sanctuary

(B) Botanical garden

(C) Biosphere reserve

(D) National park

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11. Given below are two statements:
Statement I : The Indian Government has set up GEAC, which will make decisions regarding the validity of GM research.
Statement II : Biopiracy is the term used to refer to the use of bio-resources by native people.
In the light of the above statements, choose the correct answer from the options given below :

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

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12. Pollen grains remain preserved as fossils due to the presence of :

(A) Epidermal layer
(B) Tapetum
(C) Exine layer
(D) Intine layer

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13. Identify the incorrect pair :

(A) Sphenopsida – Adiantum
(B) Pteropsida – Dryopteris
(C) Psilopsida – Psilotum
(D) Lycopsida – Selaginella

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14. Which of the following is the correct match?

(A) Gymnosperms : Cedrus, Pinus, Sequoia
(B) Angiosperms : Wolffia, Eucalyptus, Sequoia
(C) Bryophytes : Polytrichum, Polysiphonia, Sphagnum
(D) Pteridophytes : Equisetum, Ginkgo, Adiantum

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15. Given below are two statements regarding RNA polymerase in prokaryotes.
Statement I : In prokaryotes, RNA polymerase is capable of catalysing the process of elongation during transcription.
Statement II : RNA polymerase associate transiently with ‘Rho’ factor to initiate transcription.
In the light of the above statements, choose the correct answer from the options given below :

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

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16. Which of the following is a nucleotide?

(A) Uridine
(B) Adenylic acid
(C) Guanine
(D) Guanosine

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17. Match List-I with List-II :

List-I – List-II

(A) Vexillary aestivation – (I) Brinjal

(B) Epipetalous stamens – (II) Peach

(C) Epiphyllous stamens – (III) Pea

(D) Perigynous flower – (IV) Lily

Choose the correct answer from the options given below :

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

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18. Match List-I with List-II :

List-I – List-II

(A) China rose – (I) Free central

(B) Mustard – (II) Basal

(C) Primrose – (III) Axile

(D) Marigold – (IV) Parietal

Choose the correct answer from the options given below :

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

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19. Which of the following helps in maintenance of the pressure gradient in sieve tubes?

(A) Albuminous cells
(B) Sieve cells
(C) Phloem parenchyma
(D) Companion cells

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20. Mesosome in a cell is a :

(A) Membrane bound vesicular structure
(B) Chain of many ribosomes attached to a single mRNA
(C) Special structure formed by extension of plasma membrane
(D) Medium sized chromosome

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21. Match List-I with List-II :

List-I – List-II

(A) Abscisic acid – (I) Promotes female flowers in cucumber

(B) Ethylene – (II) Helps seeds to withstand desiccation

(C) Gibberellin – (III) Helps in nutrient mobilisation

(D) Cytokinin – (IV) Promotes bolting in beet, cabbage etc.

Choose the correct answer from the options given below:

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

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22. Match List-I with List - II :

List-I – List-II

(A) Genetically engineered Human Insulin – (I) Gene therapy

(B) GM Cotton – (II) E. coli

(C) ADA Deficiency – (III) Antigen-antibody interaction

(D) ELISA – (IV) Bacillus thuringiensis

Choose the correct answer from the options given below:

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

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

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

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

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23. Match List-I with List-II:

List-I – List-II

(A) ETS Complex I – (I) NADH Dehydrogenase

(B) ETS Complex II – (II) Cytochrome bC_1

(C) ETS Complex III – (III) Cytochrome C oxidase

(D) ETS Complex IV – (IV) Succinate Dehydrogenase

Choose the correct answer from the options given below :

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

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

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

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

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24. Cryopreservation technique is used for :

(A) Protection of environment

(B) Protection of Biodiversity hotspots

(C) Preservation of gametes in viable and fertile condition for a long period

(D) In-situ conservation

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25. Which of the following are correct about cellular respiration?

A. Cellular respiration is the breaking of C-C bonds of complex organic molecules by oxidation.

B. The entire cellular respiration takes place in Mitochondria.

C. Fermentation takes place under anaerobic condition in germinating seeds.

D. The fate of pyruvate formed during glycolysis depends on the type of organism also.

E. Water is formed during respiration as a result of O_2 accepting electrons and getting reduced.

Choose the correct answer from the options given below :

(A) A, C, D, E only

(B) A, B, E only

(C) A, B, C, E only

(D) B, C, D, E only

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26. Given below are two statements:
Statement I: In eukaryotes there are three RNA polymerases in the nucleus in addition to the RNA polymerase found in the organelles.
Statement II: All the three RNA polymerases in eukaryotic nucleus have different roles.
In the light of the above statements, choose the correct answer from the options given below:

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

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27. Match List-I with List-II:
List-I – List-II
(A) Histones – (I) Loosely packed chromatin
(B) Nucleosome – (II) Densely packed chromatin
(C) Euchromatin – (III) Positively charged basic proteins
(D) Heterochromatin – (IV) DNA wrapped around histone octamer
Choose the correct answer from the options given below:

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

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28. Given below are two statements:
Statement I: Failure of segregation of chromatids during cell cycle resulting in the gain or loss of whole set of chromosome in an organism is known as aneuploidy.
Statement II: Failure of cytokinesis after anaphase stage of cell division results in the gain or loss of a chromosome is called polyploidy.
In the light of the above statements, choose the correct answer from the options given below:

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

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29. Recombination between homologous chromosomes is completed by the end of

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

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30. Match List-I with List-II :

List-I – List-II

(A) Metacentric chromosome – (I) Chromosome has a terminal centromere

(B) Sub-metacentric chromosome – (II) Middle centromere forming two equal arms of chromosome

(C) Acrocentric chromosome – (III) Centromere is slightly away from the middle of chromosome resulting into two unequal arms

(D) Telocentric chromosome – (IV) Centromere is situated close to its end forming one extremely short and one very long arm

Choose the correct answer from the options given below:

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

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31. Ligases is a class of enzymes responsible for catalysing the linking together of two compounds. Which of the following bonds is not catalysed by it?

(A) C – C
(B) P – O
(C) C – O
(D) C – N

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32. F. Skoog observed that callus proliferated from the internodal segments of tobacco stem when auxin was supplied with one of the following except :

(A) Extract of Vascular tissues
(B) Coconut milk
(C) Abscisic acid
(D) Yeast Extract

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33. Given below are some statements about plant growth regulators.

A. All GAs are acidic in nature.

B. Auxins are antagonists to GAs.

C. Zeatin was isolated from coconut milk.

D. Ethylene induces flowering in Mango.

E. Abscisic acid induces parthenocarpy.

Choose the correct set of statements from the options given below :

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

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34. Identify the incorrect statement related to gel electrophoresis.

(A) Separated DNA fragments can be directly seen under UV radiation
(B) Separated DNA can be extracted from gel piece
(C) Fragment of DNA moves toward anode
(D) Sieving effect of agarose gel helps in separation of DNA fragments

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35. Which of the following examples show monocarpellary, unilocular ovary with many ovules?

A. Sesbania

B. Brinjal

C. Indigofera

D. Tobacco

E. Asparagus

Choose the correct answer from the options given below :

(A) B and E only

(B) C, D and E only

(C) A, B and D only

(D) A and C only

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36. Given below are two statements :

Statement I: In the lac operon, the z gene codes for beta-galactosidase which is primarily responsible for the hydrolysis of lactose into galactose and glucose.

Statement II: In addition to lactose, glucose or galactose can also induce lac operon.

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

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

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

(C) Both Statement I and Statement II are true

(D) Both Statement I and Statement II are false

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37. Given below are two statements:

Statement I: In a dicotyledonous leaf, the adaxial epidermis generally bears more stomata than the abaxial epidermis.

Statement II: In a dicotyledonous leaf, the adaxially placed palisade parenchyma is made up of elongated cells, which are arranged vertically and parallel to each other.

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

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

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

(C) Both Statement I and Statement II are true

(D) Both Statement I and Statement II are false

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38. Which of the following are not fatty acids?

A. Glutamic acid

B. Arachidonic acid

C. Palmitic acid

D. Lecithin

E. Aspartic acid

Choose the correct answer from the options given below :

(A) C, D and E only

(B) A and B only

(C) A, D and E only

(D) B and C only

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39. Which one of the following products diffuses out of the chloroplast during photosynthesis?

(A) ADP
(B) NADPH
(C) O_2
(D) ATP

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40. Recombinant DNA molecule can be created normally by cutting the vector DNA and source DNA respectively with:

(A) Hind II, Hind II
(B) Hind II, Alu I
(C) Hind II, EcoR I
(D) Hind II, BamHI

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41. Which one of the following is not a limitation of ecological pyramids?

(A) Saprophytes are not given any place in ecological pyramids
(B) It assumes a simple food chain, that almost never exists in nature
(C) It accommodates a food web
(D) It does not take into account the same species belonging to two or more trophic levels

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42. The Bt toxin in genetically engineered Bt cotton kills the pest by:

(A) Creating pores in the midgut
(B) Damaging the respiratory system
(C) Degenerating the nervous system
(D) Altering the pH of body fluids

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43. Match List-I with List-II:
List-I (Organisms) – List-II (Mode of Nutrition)
(A) Euglenoid – (I) Parasitic
(B) Dinoflagellate – (II) Saprophytic
(C) Slime mould – (III) Photosynthetic
(D) Plasmodium – (IV) Switching between photosynthetic and heterotrophic mode
Choose the correct answer from the options given below:

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

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44. When will the population density increase, under special conditions? When the number of :

(A) Deaths exceeds number of births and also number of emigrants equals number of immigrants.
(B) Births plus number of immigrants equals number of deaths plus number of emigrants.
(C) Births plus number of emigrants is more than the number of deaths plus number of immigrants.
(D) Births plus number of immigrants is more than the sum of number of deaths and number of emigrants.

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45. When a tall pea plant with round seeds was selfed, it produced the progeny of :
(a) Tall plants with round seeds and
(b) Tall plants with wrinkled seeds.
Identify the genotype of the parent plant.

(A) TtRr
(B) TtRR
(C) TTRR
(D) TTRr

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46. Match List-I with List-II:
List-I – List-II
(A) Biodiversity hotspot – (I) Khasi and Jaintia hills in Meghalaya
(B) Sacred groves – (II) World Summit on Sustainable Development 2002
(C) Johannesburg, South Africa – (III) Parthenium
(D) Alien species invasion – (IV) Western Ghats
Choose the correct answer from the options given below:

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

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47. Match List-I with List-II:
List-I – List-II
(A) Predator – (I) Ophrys
(B) Mutualism – (II) Pisaster
(C) Parasitism – (III) Female wasp and fig
(D) Sexual deceit – (IV) Plasmodium
Choose the correct answer from the options given below:

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

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48. Match List-I with List-II:
List-I (Location of Joint) – List-II (Type of Joint)
(A) Joint between humerus and pectoral girdle – (I) Gliding joint
(B) Knee joint – (II) Ball and Socket joint
(C) Joint between atlas and axis – (III) Hinge joint
(D) Joint between carpals – (IV) Pivot joint
Choose the correct answer from the options given below:

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

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49. Following are the steps involved in action of toxin in Bt. Cotton

A. The inactive toxin converted into active form due to alkaline pH of gut of insect.

B. Bacillus thuringiensis produces crystals with toxic insecticidal proteins.

C. The alkaline pH solubilises the crystals.

D. The activated toxin binds to the surface of midgut cells, creates pores and causes death of the insect.

E. The toxin proteins exist as inactive protoxins in bacteria.

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

(A) E → C → B → A → D
(B) B → C → A → E → D
(C) A → E → B → D → C
(D) B → E → C → A → D

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50. Match List-I with List-II :

List-I – List-II

(A) Gene pool – (I) Stable within a generation

(B) Genetic drift – (II) Change in gene frequency by chance

(C) Gene flow – (III) Transfer of genes into or out of population

(D) Gene frequency – (IV) Total number of genes and their alleles

Choose the correct answer from the options given below :

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

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51. A person with blood group ARh– can receive the blood transfusion from which of the following types?

A. BRh^-

B. $ABRh^-$

C. ORh^-

D. ARh^-

E. ARh^+

Choose the correct answer from the options given below :

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

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52. Enzymes that catalyse the removal of groups from substrates by mechanisms other than hydrolysis leaving double bonds, are known as :

(A) Transferases
(B) Oxidoreductases
(C) Dehydrogenases
(D) Lyases

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53. Match List-I with List-II.

List-I (Event) – List-II (Stage of Prophase-I (Meiosis-I))

(A) Chiasmata formation – (I) Pachytene

(B) Crossing over – (II) Diakinesis

(C) Synaptonemal complex formation – (III) Diplotene

(D) Terminalisation of chiasmata – (IV) Zygotene

Choose the correct answer from the options given below :

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

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

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

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

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54. Match List-I with List-II.

List-I – List-II

(A) Primary structure of protein – (I) Human haemoglobin

(B) Secondary structure of protein – (II) Disulphide bonds

(C) Tertiary structure of protein – (III) Polypeptide chain

(D) Quaternary structure of protein – (IV) Alpha helix and β sheet

Choose the correct answer from the options given below :

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

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

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

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

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55. Match List-I with List-II.

List-I – List-II

(A) Epinephrine – (I) Hyperglycemia

(B) Thyroxine – (II) Smooth muscle contraction

(C) Oxytocin – (III) Basal metabolic rate

(D) Glucagon – (IV) Emergency hormone

Choose the correct answer from the options given below :

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

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

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

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

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56. Which of the following statements is correct about the type of junction and their role in our body?

(A) Adhering junctions facilitate the cells to communicate with each other.

(B) Tight junctions help to stop substances from leaking across a tissue.

(C) Tight junctions help to perform cementing to keep neighbouring cells together.

(D) Gap junctions help to create gap between the cells and tissues.

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57. Select the restriction endonuclease enzymes whose restriction sites are present for the tetracycline resistance (tet^R) gene in the pBR322 cloning vector.

(A) Bam HI and Sal I

(B) Sal I and Pst I

(C) Pst I and Pvu I

(D) Pvu I and Bam HI

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58. Match List-I with List-II.

List-I – List-II

(A) Chondrichthyes – (I) Clarias

(B) Cyclostomata – (II) Carcharodon

(C) Osteichthyes – (III) Myxine

(D) Amphibia – (IV) Ichthyophis

Choose the correct answer from the options given below :

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

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

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

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

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

Assertion A: During menstrual cycle, the ovulation takes place approximately on 14th day.

Reason R: Rapid secretion of LH in the middle of menstrual cycle induces rupture of Graafian follicle and thereby the release of ovum.

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

(A) A is correct but R is not correct.

(B) A is not correct but R is correct.

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

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

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60. Match List-I with List-II with respect to convergent evolution:

List-I – List-II

(A) Lemur – (I) Flying phalanger

(B) Bobcat – (II) Numbat

(C) Anteater – (III) Spotted cuscus

(D) Flying squirrels – (IV) Tasmanian tiger cat

Choose the correct answer from the options given below:

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

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

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

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

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61. Match List-I with List-II.

List-I – List-II

(A) Cells are metabolically active and proliferate – (I) G_2 phase

(B) DNA replication takes place – (II) G_1 phase

(C) Proteins are synthesised – (III) G_0 phase

(D) Quiescent stage with metabolically active cells – (IV) S phase

Choose the correct answer from the options given below:

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

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

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

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

NEET 2024 Re-exam

62. Match List-I with List-II relating to microbes and their products:
List-I (Microbes) – List-II (Products)
(A) Streptococcus – (I) Citric acid
(B) Trichoderma polysporum – (II) Clot buster
(C) Monascus purpureus – (III) Cyclosporin A
(D) Aspergillus niger – (IV) Statins
Choose the correct answer from the options given below:

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

NEET 2024 Re-exam

63. Match List-I with List-II.
List-I – List-II
(A) F Particles – (I) Chromosomes
(B) Histones – (II) Cilia
(C) Axoneme – (III) Golgi apparatus
(D) Cisternae – (IV) Mitochondria
Choose the correct answer from the options given below:

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

NEET 2024 Re-exam

64. Match List-I with List-II relating to examples of various kind of IUDs and barrier:
List-I – List-II
(A) Copper releasing IUD – (I) Vaults
(B) Non-medicated IUD – (II) Multiload 375
(C) Contraceptive barrier – (III) LNG-20
(D) Hormone releasing IUD – (IV) Lippes loop
Choose the correct answer from the options given below:

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

NEET 2024 Re-exam

65. Given below are two statements:
Statement I: Antibiotics are chemicals produced by microbes that kill other microbes.
Statement II: Antibodies are chemicals formed in body that eliminate microbes.
In the light of the above statements, choose the most appropriate answer from the options given below.

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

NEET 2024 Re-exam

66. Arrange the following parts in human Mammary gland, traversing the route of milk ejection.

A. Mammary duct
B. Lactiferous duct
C. Mammary alveolus
D. Ampulla
E. Mammary tubule

Choose the correct answer from the options given below:

(A) D → C → E → A → B
(B) C → E → B → A → D
(C) C → E → A → D → B
(D) A → C → E → D → B

NEET 2024 Re-exam

67. Which of the following are correct about EcoRI?

A. Cut the DNA with blunt end
B. Cut the DNA with sticky end
C. Recognise a specific palindromic sequence
D. Cut the DNA between the base G and A when encounters the DNA sequence 'GAATTC'
E. Exonuclease

Choose the correct answer from the options given below:

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

NEET 2024 Re-exam

68. Which of the following is/are present in female cockroach?

A. Collateral gland
B. Mushroom gland
C. Spermatheca
D. Anal style
E. Phallic gland

Choose the most appropriate answer from the options given below:

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

NEET 2024 Re-exam

69. Match List-I with List-II:

List-I – List-II
(A) Malignant tumors – (I) Destroy tumors
(B) MALT – (II) AIDS
(C) NACO – (III) Metastasis
(D) α-Interferons – (IV) Lymphoid tissue

Choose the correct answer from the options given below:

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

NEET 2024 Re-exam

70. Open Circulatory system is present in :

(A) Palaemon, Nereis, Balanoglossus
(B) Hirudinaria, Bombyx, Salpa
(C) Anopheles, Limax, Limulus
(D) Pheretima, Musca, Pila

NEET 2024 Re-exam

71. In which of the following connective tissues, the cells secrete fibres of collagen or elastin?

A. Cartilage
B. Bone
C. Adipose tissue
D. Blood
E. Areolar tissue

Choose the most appropriate answer from the options given below :

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

NEET 2024 Re-exam

72. Match List-I with List-II:

List-I – List-II

(A) Residual Volume – (I) Maximum volume of air that can be breathed in after forced expiration
(B) Vital Capacity – (II) Volume of air inspired or expired during normal respiration
(C) Expiratory Capacity – (III) Volume of air remaining in lungs after forcible expiration
(D) Tidal Volume – (IV) Total volume of air expired after normal inspiration

Choose the correct answer from the options given below:

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

NEET 2024 Re-exam

73. Match List I with List II:

List-I – List-II

(A) Living Fossil – (I) Elongated canine teeth
(B) Connecting Link – (II) Vermiform appendix
(C) Vestigial Organ – (III) Echidna
(D) Atavism – (IV) Latimeria

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

NEET 2024 Re-exam

74. Match List-I with List -II

List-I – List-II

(A) Schwann cells – (I) Neurotransmitter

(B) Synaptic knob – (II) Cerebral cortex

(C) Bipolar neurons – (III) Myelin sheath

(D) Multipolar neurons – (IV) Retina

Choose the correct answer from the options given below:

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

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

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

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

NEET 2024 Re-exam

75. Diuresis is prevented by:

(A) Renin from JG cell via switching off the osmoreceptors

(B) ANF from atria of the heart

(C) Aldosterone from adrenal medulla

(D) Vasopressin from Neurohypophysis

NEET 2024 Re-exam

76. Following is the list of STDs. Select the diseases which are not completely curable.

A. Genital warts

B. Genital herpes

C. Syphilis

D. Hepatitis-B

E. Trichomoniasis

Choose the correct answer from the options given below:

(A) A and D only

(B) B and D only

(C) A and C only

(D) D and E only

NEET 2024 Re-exam

77. What is the correct order (old to recent) of periods in Paleozoic era?

(A) Silurian, Devonian, Permian, Carboniferous

(B) Silurian, Devonian, Carboniferous, Permian

(C) Permian, Devonian, Silurian, Carboniferous

(D) Silurian, Carboniferous, Permian, Devonian

NEET 2024 Re-exam

78. 'Lub' sound of Heart is caused by the _____.

(A) closure of the semilunar valves

(B) opening of tricuspid and bicuspid valves

(C) opening of the semilunar valves

(D) closure of the tricuspid and bicuspid valves

NEET 2024 Re-exam

79. Match List-I with List-II relating to human female external genitalia.
List-I – List-II
(A) Mons pubis – (I) A fleshy fold of tissue surrounding the vaginal opening
(B) Clitoris – (II) Fatty cushion of cells covered by skin and hair
(C) Hymen – (III) Tiny finger-like structure above labia minora
(D) Labia majora – (IV) A thin membrane-like structure covering vaginal opening
Choose the correct answer from the option given below :

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

NEET 2024 Re-exam

80. Aneuploidy is a chromosomal disorder where chromosome number is not the exact copy of its haploid set of chromosomes, due to :
A. Substitution
B. Addition
C. Deletion
D. Translocation
E. Inversion
Choose the most appropriate answer from the options given below :

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

NEET 2024 Re-exam

81. Given below are two statements :
Statement I : RNA interference takes place in all Eukaryotic organisms as method of cellular defense.
Statement II : RNAi involves the silencing of a specific mRNA due to a complementary single-stranded RNA molecule that binds and prevents translation of mRNA
In the light of the above statements, choose the correct answer from the options given below.

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

NEET 2024 Re-exam

82. Identify the wrong statements :
A. Erythropoietin is produced by juxtaglomerular cells of the kidney
B. Leydig cells produce Androgens
C. Atrial Natriuretic factor, a peptide hormone is secreted by the seminiferous tubules of the testes
D. Cholecystokinin is produced by gastrointestinal tract
E. Gastrin acts on intestinal wall and helps in the production of pepsinogen
Choose the most appropriate answer from the options given below :

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

NEET 2024 Re-exam

83. Following are the steps involved in the process of PCR.

A. Annealing

B. Amplification (~1 billion times)

C. Denaturation

D. Treatment with Taq polymerase and deoxynucleotides

E. Extension

Choose the correct sequence of steps of PCR from the options given below :

(A) C → A → D → E → B

(B) A → B → E → D → C

(C) A → C → E → D → B

(D) D → B → E → C → A

NEET 2024 Re-exam

84. Given below are two statements:

Statement I: Concentrated urine is formed due to counter current mechanism in nephron.

Statement II: Counter current mechanism helps to maintain osmotic gradient in the medullary interstitium.

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

(A) Statement I is correct but Statement II is incorrect.

(B) Statement I is incorrect but Statement II is correct.

(C) Both Statement I and Statement II are correct.

(D) Both Statement I and Statement II are incorrect.

NEET 2024 Re-exam

85. Given below are two statements :

Statement I : Concentrically arranged cisternae of Golgi complex are arranged near the nucleus with distinct convex cis or maturing and concave trans or forming face.

Statement II : A number of proteins are modified in the cisternae of Golgi complex before they are released from cis face.

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

(A) Statement I is true but Statement II is false.

(B) Statement I is false but Statement II is true.

(C) Both Statement I and Statement II are true

(D) Both Statement I and Statement II are false

NEET 2024 Re-exam

86. Match List-I with List-II:

List-I – List-II

(A) Parturition – (I) Several antibodies for new-born babies

(B) Placenta – (II) Collection of ovum after ovulation

(C) Colostrum – (III) Foetal ejection reflex

(D) Fimbriae – (IV) Secretion of the hormone hCG

Choose the correct answer from the options given below:

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

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

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

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

NEET 2024 Re-exam

87. Given below are two statements: One is labelled as Assertion A and the other is labelled as Reason R.
Assertion A: Members of subphylum vertebrata possess notochord during the embryonic period. The notochord is replaced by a cartilaginous or bony vertebral column in the adult.
Reason R: Thus all chordates are vertebrates not all vertebrates are chordates.
In the light of the above statements choose the correct answer from the options given below.

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

NEET 2024 Re-exam

88. The mother has A+ blood group the father has B+ and the child is A+. What can be the possibility of genotypes of all three, respectively?
A. I^AI^A | I^Bi | I^Bi
B. I^AI^A | I^Bi | I^Ai
C. I^Bi | I^AI^A | I^AI^B
D. I^AI^A | I^BI^B | I^Ai
E. I^Ai | I^Bi | I^Ai
Choose the correct answer from the options given below:

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

NEET 2024 Re-exam

89. Select the correct statements regarding mechanism of muscle contraction.
A. It is initiated by a signal sent by CNS via sensory neuron.
B. Neurotransmitter generates action potential in the sarcolemma.
C. Increased Ca^{++} level leads to the binding of calcium with troponin on actin filaments.
D. Masking of active site for actin is activated.
E. Utilising the energy from ATP hydrolysis to form cross bridge.
Choose the most appropriate answer from the options given below:

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

NEET 2024 Re-exam

90. Match List I with List II :
List-I – List-II
(A) Squamous Epithelium – (I) Goblet cells of alimentary canal
(B) Ciliated Epithelium – (II) Inner lining of pancreatic ducts
(C) Glandular Epithelium – (III) Walls of blood vessels
(D) Compound Epithelium – (IV) Inner surface of Fallopian tubes
Choose the correct answer from the options given below :

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

NEET 2024 Re-exam

91. Match List I with List II :

List-I – List-II

(A) B-Lymphocytes – (I) Passive immunity

(B) Interferons – (II) Cell mediated immunity

(C) T-Lymphocytes – (III) Produce an army of proteins in response to pathogens

(D) Colostrum – (IV) Innate immunity

Choose the correct answer from the options given below :

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

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

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

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

NEET 2024 Re-exam

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

Assertion A: During the transportation of gases, about 20-25 percent of CO_2 is carried by Haemoglobin as carbamino-haemoglobin.

Reason R: This binding is related to high pCO_2 and low pO_2 in tissues.

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

(A) A is true but R is false.

(B) A is false but R is true.

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

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

Answer key and explanations

1. Answer: (C) Biodiversity Hotspots

Biodiversity hotspots are regions with very high species richness and endemism that have already lost a large share (about 70%) of their original habitat, which is why they are given priority for conservation. Sacred groves are small community-protected forest patches, not regions identified by these criteria.

2. Answer: (A) Sclereids

Sclereids are short, irregular, highly lignified sclerenchyma cells and are typical of the hard shells of nuts, the gritty pulp of pear and guava, and tea leaves. Fibres are long, pointed cells found mainly in bundles in stems and leaves, not as stone cells in fruit pulp.

3. Answer: (D) ori site

Replication of DNA starts at a specific sequence called the origin of replication (ori); any DNA linked to an ori can be replicated, which is why vectors carry one. Recognition and restriction sites are sequences read and cut by restriction enzymes, and a cloning site is where foreign DNA is inserted.

4. Answer: (B) Statement I is false but Statement II is true

When many alleles of one gene control a character it is multiple allelism (as in ABO blood groups), so the first statement is false; polygenic inheritance involves several genes. In polygenic traits such as human skin colour each contributing allele adds a small effect, so the second statement is true.

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

The light reaction needs light, chlorophyll (pigments of the photosystems) and water, whose photolysis supplies electrons and releases O_2. CO_2 is used only in the Calvin cycle (dark reaction), and O_2 is a product of the light reaction, not a requirement, so only water, chlorophyll and light are needed.

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

Flemming named chromatin, Robert Brown discovered the nucleus, George Palade observed ribosomes under the electron microscope, and Camillo Golgi described the disc-shaped cisternae near the nucleus (Golgi apparatus). The common trap is pairing Palade with the Golgi body because both are endomembrane discoveries.

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

Flower colour in Antirrhinum (snapdragon) shows incomplete dominance, human ABO blood groups show co-dominance, phenylketonuria is a pleiotropic single-gene disorder, and human skin colour is polygenic. Skin colour is not incomplete dominance because it is controlled by several genes.

8. Answer: (A) Nucellus

The nucellus is the mass of cells inside the integuments that contains reserve food materials and encloses the embryo sac. Integuments only form protective layers, and the funicle merely attaches the ovule to the placenta.

9. Answer: (D) Vessels

Gymnosperm xylem consists of tracheids and lacks vessels, which are characteristic of angiosperms (Gnetales being an exception). Sieve cells and albuminous cells are the conducting and companion-like cells of gymnosperm phloem, so they are present.

10. Answer: (B) Botanical garden

A botanical garden conserves plants away from their natural habitat, so it is ex-situ conservation. Wildlife sanctuaries, national parks and biosphere reserves protect species within their natural ecosystems, i.e. in-situ.

11. Answer: (A) Statement I is true but Statement II is false

The Genetic Engineering Approval Committee (GEAC) was set up by the Indian Government to decide on the validity of GM research and the safety of introducing GM organisms, so the first statement is true. Biopiracy is the use of bio-resources and traditional knowledge by multinational companies without proper authorisation or compensation to the native people, so the second statement is false.

12. Answer: (C) Exine layer

The exine of the pollen wall is made of sporopollenin, one of the most resistant organic materials, which withstands high temperature, strong acids and alkalis and enzymatic degradation, so pollen is well preserved as fossils. The intine is a thin pectocellulosic layer that decays easily.

13. Answer: (A) Sphenopsida – Adiantum

Adiantum is a fern and belongs to Pteropsida; Sphenopsida is represented by Equisetum, so that pair is incorrect. Dryopteris (Pteropsida), Psilotum (Psilopsida) and Selaginella (Lycopsida) are correctly placed.

14. Answer: (A) Gymnosperms : Cedrus, Pinus, Sequoia

Cedrus, Pinus and Sequoia are all gymnosperms, so that set is correct. Sequoia is wrongly listed under angiosperms, Polysiphonia is a red alga rather than a bryophyte, and Ginkgo is a gymnosperm rather than a pteridophyte.

15. Answer: (A) Statement I is true but Statement II is false

Bacterial RNA polymerase alone catalyses chain elongation during transcription, so the first statement is true. It associates transiently with the sigma factor to initiate transcription and with the rho factor to terminate it, so the second statement is false.

16. Answer: (B) Adenylic acid

A nucleotide is a nitrogen base + sugar + phosphate; adenylic acid (adenosine monophosphate) has all three. Uridine and guanosine are nucleosides (base + sugar only), and guanine is just a nitrogenous base.

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

Vexillary aestivation is seen in pea, epipetalous stamens (attached to petals) in brinjal, epiphyllous stamens (attached to perianth) in lily, and perigynous flowers in peach (also plum and rose). Matching lily with epipetalous is the trap, but lily has tepals, not separate petals.

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

China rose has axile placentation, mustard parietal (with a false septum), primrose free central, and marigold (sunflower family) basal placentation. Mustard is often mistaken for axile because of its false septum, but the ovules are borne on the ovary wall.

19. Answer: (D) Companion cells

Companion cells are connected to sieve tube elements by pit fields and their nuclei control the sieve tubes; they help maintain the pressure gradient in the sieve tubes. Albuminous and sieve cells are found in gymnosperms, and phloem parenchyma only stores food and other substances.

20. Answer: (C) Special structure formed by extension of plasma membrane

A mesosome is a special membranous structure formed by infoldings (extensions) of the plasma membrane of prokaryotes, helping in wall formation, DNA replication and respiration. A chain of ribosomes on one mRNA is a polysome, and mesosomes are not membrane-bound vesicles.

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

Abscisic acid helps seeds withstand desiccation, ethylene promotes female flowers in cucumber, gibberellins cause bolting in beet and cabbage, and cytokinins promote nutrient mobilisation and delay senescence. Assigning nutrient mobilisation to ethylene is the trap.

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

Genetically engineered human insulin was produced in E. coli, GM cotton carries the cry gene of Bacillus thuringiensis, ADA deficiency was the first disease treated by gene therapy, and ELISA works on antigen–antibody interaction. These pairings follow directly from each technology's basis.

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

Complex I of the electron transport system is NADH dehydrogenase, complex II is succinate dehydrogenase, complex III is the cytochrome bc_1 complex, and complex IV is cytochrome c oxidase. Mixing up complexes I and II is the common trap, since both are dehydrogenases.

24. Answer: (C) Preservation of gametes in viable and fertile condition for a long period

Cryopreservation stores gametes, embryos and other tissues at very low temperature (in liquid nitrogen at −196 °C) so they remain viable and fertile for long periods; it is an ex-situ method. It is therefore not an in-situ technique and does not protect hotspots or the environment as such.

25. Answer: (A) A, C, D, E only

Respiration is the oxidative breakdown of C–C bonds of food, the fate of pyruvate depends on the organism and conditions, fermentation can occur under anaerobic conditions (as in germinating seeds deprived of oxygen), and water forms when O_2 accepts electrons at the end of the ETS. The statement that the entire process occurs in mitochondria is false because glycolysis takes place in the cytoplasm.

26. Answer: (C) Both Statement I and Statement II are correct

Eukaryotic nuclei contain RNA polymerase I, II and III, in addition to the separate RNA polymerases of mitochondria and chloroplasts, so the first statement is true. They divide the work: polymerase I makes rRNAs, II makes hnRNA (mRNA precursor) and III makes tRNA, 5S rRNA and snRNAs, so the second statement is also true.

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

Histones are positively charged basic proteins rich in lysine and arginine, a nucleosome is DNA wrapped around a histone octamer, euchromatin is loosely packed (transcriptionally active) chromatin and heterochromatin is densely packed chromatin. Confusing histones with nucleosomes is the main trap.

28. Answer: (D) Both Statement I and Statement II are false

Failure of chromatid segregation causes gain or loss of one or a few chromosomes (aneuploidy), not of a whole set, so the first statement is false. Failure of cytokinesis after telophase leads to an increase in a whole set of chromosomes (polyploidy), not gain or loss of one chromosome, so the second statement is also false.

29. Answer: (D) Pachytene

Crossing over between non-sister chromatids of homologous chromosomes occurs during pachytene, and recombination is completed by the end of this stage. Chiasmata only become visible in diplotene, which is why diplotene is a tempting but wrong choice.

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

A metacentric chromosome has a middle centromere and two equal arms, a sub-metacentric one has the centromere slightly away from the middle giving unequal arms, an acrocentric one has it close to one end giving one very short and one long arm, and a telocentric one has a terminal centromere. Swapping acrocentric and telocentric is the usual mistake.

31. Answer: (A) C – C

Ligases are described as catalysing the linking of two compounds by forming C–O, C–S, C–N and P–O bonds; C–C is not in this list, so it is the answer expected. P–O bonds (for example joining DNA fragments) are the classic ligase reaction.

32. Answer: (C) Abscisic acid

Skoog and Miller found that callus from tobacco internodes proliferated when auxin was supplied together with extracts of vascular tissue, yeast extract, coconut milk or DNA, which led to the discovery of cytokinins. Abscisic acid is a growth inhibitor and was not among these substances.

33. Answer: (A) A, C, D

All gibberellins are acidic, zeatin was isolated from corn kernels and coconut milk, and ethylene induces flowering in mango, so these three are correct. It is abscisic acid, not auxin, that acts as the antagonist of gibberellins, and parthenocarpy is induced by auxins and gibberellins, not by abscisic acid.

34. Answer: (A) Separated DNA fragments can be directly seen under UV radiation

DNA fragments in an agarose gel cannot be seen directly; they become visible as orange bands only after staining with ethidium bromide and exposure to UV light, so that statement is incorrect. DNA is negatively charged and moves towards the anode, separated by the sieving effect of the gel, and bands can be cut out and eluted.

35. Answer: (D) A and C only

Sesbania and Indigofera belong to Fabaceae, whose pistil is monocarpellary with a unilocular ovary bearing many ovules (marginal placentation). Brinjal and tobacco (Solanaceae) have a bicarpellary ovary, and Asparagus (Liliaceae) has a tricarpellary ovary.

36. Answer: (A) Statement I is true but Statement II is false

The z gene codes for β-galactosidase, which hydrolyses lactose into galactose and glucose, so the first statement is true. The lac operon inducer is lactose (or its analogues); glucose or galactose cannot induce it, so the second statement is false.

37. Answer: (B) Statement I is false but Statement II is true

In a dorsiventral (dicot) leaf the abaxial (lower) epidermis generally bears more stomata than the adaxial one, so the first statement is false. The adaxially placed palisade parenchyma has elongated cells arranged vertically and parallel to each other, so the second statement is true.

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

Glutamic acid and aspartic acid are amino acids, and lecithin is a phospholipid, so these are not fatty acids. Arachidonic acid (20 C) and palmitic acid (16 C) are fatty acids with a carboxyl group attached to an R group.

39. Answer: (C) O_2

O_2 released by photolysis of water diffuses out of the chloroplast. ATP and NADPH formed in the light reaction are used up inside the chloroplast stroma in the Calvin cycle, and ADP is regenerated there too.

40. Answer: (A) Hind II, Hind II

To join vector and source DNA, both are normally cut with the same restriction enzyme so that their ends are compatible; using Hind II on both satisfies this. Using two different enzymes generally produces ends that cannot be ligated together.

41. Answer: (C) It accommodates a food web

Ecological pyramids are limited because they assume a simple food chain, ignore saprophytes and cannot place one species in two or more trophic levels; in fact they do not accommodate a food web. So the statement that they accommodate a food web is not a limitation (it is untrue).

42. Answer: (A) Creating pores in the midgut

The Bt protoxin becomes active in the alkaline insect gut, binds to the surface of midgut epithelial cells and creates pores, causing swelling, lysis and death of the insect. It does not act on the respiratory or nervous system.

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

Euglenoids are photosynthetic in light but heterotrophic in its absence, dinoflagellates are mostly photosynthetic, slime moulds are saprophytic, and Plasmodium is a parasite. Labelling dinoflagellates as saprophytic is the trap.

44. Answer: (D) Births plus number of immigrants is more than the sum of number of deaths and number of emigrants.

Population density increases when additions exceed losses, i.e. births plus immigration is greater than deaths plus emigration ($N_{t+1} = N_t + [(B + I) - (D + E)]$). Equal additions and losses keep it constant, and more deaths than births reduce it.

45. Answer: (D) TTRr

All progeny are tall, so the parent is homozygous TT; both round and wrinkled seeds appear, so it must be heterozygous Rr, giving TTRr. TtRr would also produce dwarf plants, and TTRR or TtRR could not give wrinkled seeds.

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

The Western Ghats is a biodiversity hotspot, the Khasi and Jaintia hills of Meghalaya have sacred groves, the 2002 World Summit on Sustainable Development was held in Johannesburg, and Parthenium is an alien invasive weed. These pairings follow directly from the conservation examples.

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

Pisaster (a starfish) is a predator, the fig and its pollinating female wasp are mutualists, Plasmodium is a parasite, and the orchid Ophrys uses sexual deceit to get pollinated by bees. Wasp–fig is the classic mutualism, not parasitism.

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

The humerus and pectoral girdle form a ball-and-socket joint, the knee is a hinge joint, the atlas–axis joint is a pivot joint, and joints between carpals are gliding joints. Swapping the knee with the shoulder type is the usual error.

49. Answer: (D) B → E → C → A → D

Bacillus thuringiensis forms protein crystals, the toxin exists in them as inactive protoxin, the alkaline insect gut pH solubilises the crystals, the protoxin is converted into active toxin, and the active toxin binds to midgut cells, creates pores and kills the insect. Activation cannot precede solubilisation, which rules out the other sequences.

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

The gene pool is the total number of genes and their alleles in a population, genetic drift is change in gene frequency by chance, gene flow is transfer of genes into or out of a population, and gene frequency stays stable within a generation in Hardy–Weinberg equilibrium. Confusing gene flow with drift is the trap.

51. Answer: (D) C and D only

An A Rh^- person has anti-B antibodies and lacks Rh antigen, so the donor must have no B antigen and be Rh negative: O Rh^- and A Rh^- are safe. B or AB blood carries B antigen, and A Rh^+ blood would sensitise the Rh negative recipient.

52. Answer: (D) Lyases

Lyases remove groups from substrates by mechanisms other than hydrolysis, leaving double bonds. Transferases move groups between substrates, and oxidoreductases/dehydrogenases catalyse oxidation–reduction.

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

Synaptonemal complex forms during zygotene, crossing over occurs in pachytene, chiasmata become visible in diplotene, and terminalisation of chiasmata occurs in diakinesis. Placing chiasma formation in diakinesis confuses formation with terminalisation.

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

The primary structure is the sequence of amino acids in the polypeptide chain, secondary structure is the alpha helix and β sheet, tertiary structure is stabilised by bonds such as disulphide bonds, and quaternary structure is the assembly of subunits as in human haemoglobin. Haemoglobin is the standard example of quaternary structure.

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

Epinephrine is the emergency (fight-or-flight) hormone, thyroxine regulates the basal metabolic rate, oxytocin causes smooth muscle contraction (uterus during birth, milk ejection), and glucagon raises blood glucose (hyperglycaemia). Linking epinephrine to smooth muscle contraction misses its classic emergency role.

56. Answer: (B) Tight junctions help to stop substances from leaking across a tissue.

Tight junctions stop substances from leaking across a tissue. Cementing neighbouring cells together is the role of adhering junctions, and gap junctions allow cells to communicate by connecting their cytoplasm, not to create gaps.

57. Answer: (A) Bam HI and Sal I

In pBR322, BamHI and SalI have their recognition sites inside the tetracycline resistance gene, so inserting DNA there inactivates tet^R. PstI and PvuI sites lie within the ampicillin resistance gene.

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

Carcharodon (great white shark) is a cartilaginous fish, Myxine (hagfish) is a cyclostome, Clarias (magur) is a bony fish, and Ichthyophis (limbless caecilian) is an amphibian. Ichthyophis is often mistaken for a fish because of its name.

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

In a 28-day cycle ovulation occurs around day 14, and this happens because the LH surge in the middle of the cycle induces rupture of the Graafian follicle and release of the ovum. So both statements are true and the reason explains the assertion.

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

In convergent evolution of Australian marsupials and placental mammals, the lemur matches the spotted cuscus, the bobcat the Tasmanian tiger cat, the anteater the numbat, and the flying squirrel the flying phalanger. Pairing the bobcat with the numbat is the trap; the numbat is the marsupial anteater.

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

In G_1 cells are metabolically active and grow continuously, in S phase DNA replicates, in G_2 proteins are synthesised in preparation for mitosis, and G_0 is the quiescent stage where cells stay metabolically active but stop proliferating. G_0 cannot be the proliferating stage.

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

Streptococcus produces streptokinase, a clot buster; Trichoderma polysporum produces cyclosporin A, an immunosuppressant; Monascus purpureus produces statins; and Aspergillus niger produces citric acid. Linking Streptococcus to citric acid is the common error.

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

F_0–F_1 particles (oxysomes) occur on the inner mitochondrial membrane, histones are part of chromosomes, the axoneme is the core of cilia and flagella, and cisternae make up the Golgi apparatus. Cisternae also occur in ER, but among the given choices they match the Golgi apparatus.

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

Multiload 375 is a copper-releasing IUD, the Lippes loop is a non-medicated IUD, vaults are barrier contraceptives, and LNG-20 is a hormone-releasing IUD. Confusing LNG-20 with a barrier is the trap.

65. Answer: (C) Both Statement I and Statement II are correct

Antibiotics are chemical substances produced by some microbes that kill or retard the growth of other (disease-causing) microbes, and antibodies are proteins formed in the body by B cells that help eliminate pathogens. Both statements are therefore correct.

66. Answer: (C) C → E → A → D → B

Milk is secreted in the mammary alveoli, passes into mammary tubules, then mammary ducts, which join to form a wider ampulla, and finally drains through the lactiferous duct. Any order that starts at the ampulla or duct reverses the route.

67. Answer: (D) B, C, D only

EcoRI recognises the palindromic sequence GAATTC and cuts between G and A on each strand, leaving sticky ends. It is an endonuclease that cuts within DNA and does not produce blunt ends, so the blunt-end and exonuclease statements are wrong.

68. Answer: (D) A and C only

The female cockroach has collateral glands (which form the ootheca) and a spermatheca that stores sperm. Mushroom glands, phallic glands and anal styles are features of the male cockroach.

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

Malignant tumours spread by metastasis, MALT is mucosa-associated lymphoid tissue, NACO (National AIDS Control Organisation) deals with AIDS, and α-interferons activate the immune system and help destroy tumours. Linking interferons to lymphoid tissue is the trap.

70. Answer: (C) Anopheles, Limax, Limulus

Arthropods (Anopheles, Limulus) and most molluscs (Limax, a slug) have an open circulatory system. Nereis, Pheretima and Hirudinaria are annelids with closed circulation, so any set containing them is wrong.

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

In all connective tissues except blood, the cells secrete fibres of structural proteins such as collagen or elastin; so cartilage, bone, adipose tissue and areolar tissue qualify. Blood is a fluid connective tissue whose cells do not secrete such fibres.

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

Residual volume is the air left in the lungs after forcible expiration, vital capacity is the maximum air breathed in after forced expiration, expiratory capacity is the total air expired after a normal inspiration (TV + ERV), and tidal volume is the air inspired or expired in normal breathing. Mixing vital capacity with expiratory capacity is the trap.

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

Latimeria (coelacanth) is a living fossil, Echidna (egg-laying mammal) is a connecting link between reptiles and mammals, the vermiform appendix is a vestigial organ, and elongated canines in humans are an atavism (reappearance of an ancestral trait). Calling the appendix an atavism confuses vestigial with reappearing traits.

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

Schwann cells form the myelin sheath, synaptic knobs contain vesicles of neurotransmitter, bipolar neurons are found in the retina, and multipolar neurons are found in the cerebral cortex. Retina is the textbook location for bipolar neurons.

75. Answer: (D) Vasopressin from Neurohypophysis

Vasopressin (ADH), released from the neurohypophysis, increases water reabsorption from the distal parts of the tubule and so prevents diuresis. ANF promotes loss of water and salt, and aldosterone comes from the adrenal cortex, not the medulla.

76. Answer: (B) B and D only

Except for hepatitis-B, genital herpes and HIV infection, sexually transmitted diseases are completely curable if detected early and treated properly. Syphilis, trichomoniasis and genital warts are curable, so genital herpes and hepatitis-B are the ones not completely curable.

77. Answer: (B) Silurian, Devonian, Carboniferous, Permian

From oldest to youngest the later Palaeozoic periods are Silurian, Devonian, Carboniferous and Permian; the Permian closes the Palaeozoic era. Any order placing the Permian before the Carboniferous reverses the sequence.

78. Answer: (D) closure of the tricuspid and bicuspid valves

The first heart sound ‘lub’ is produced by the closure of the tricuspid and bicuspid (atrioventricular) valves at the start of ventricular systole. Closure of the semilunar valves produces the second sound ‘dub’.

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

The mons pubis is a fatty cushion covered by skin and pubic hair, the clitoris is a tiny finger-like structure above the urethral opening at the junction of the labia minora, the hymen is a thin membrane partially covering the vaginal opening, and the labia majora are fleshy folds surrounding the vaginal opening. Hymen and labia majora are the pair most often swapped.

80. Answer: (D) B and C only

Aneuploidy is the gain (addition) or loss (deletion) of one or more chromosomes, so the chromosome number is not an exact multiple of the haploid set. Substitution, translocation and inversion rearrange genes or segments without changing the chromosome number.

81. Answer: (A) Statement I is true but Statement II is false.

RNA interference occurs in all eukaryotic organisms as a method of cellular defence, so the first statement is true. RNAi silences a specific mRNA by a complementary double-stranded RNA molecule that binds and prevents its translation, so describing it as a single-stranded RNA makes the second statement false.

82. Answer: (C) C and E only

Atrial natriuretic factor is secreted by the atrial wall of the heart, not by the seminiferous tubules, and gastrin acts on the gastric glands (stomach) to stimulate HCl and pepsinogen secretion, not on the intestinal wall; these two are wrong. Erythropoietin from juxtaglomerular cells, androgens from Leydig cells and cholecystokinin from the gut are correct.

83. Answer: (A) C → A → D → E → B

PCR begins with denaturation of the double-stranded DNA, followed by annealing of primers, then Taq polymerase with deoxynucleotides carries out extension; repeating these cycles amplifies the DNA about a billion times. Annealing cannot come first because the strands must be separated before primers can bind.

84. Answer: (C) Both Statement I and Statement II are correct.

The counter-current mechanism of the loop of Henle and vasa recta maintains an increasing osmolarity in the medullary interstitium, and this gradient allows water to be drawn out of the collecting duct to form concentrated urine. Both statements are therefore correct.

85. Answer: (D) Both Statement I and Statement II are false

The convex cis face of the Golgi is the forming face and the concave trans face is the maturing face; the statement reverses them, so it is false. Proteins are modified in the cisternae before release from the trans face, not the cis face, so the second statement is also false.

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

Parturition is triggered by the foetal ejection reflex, the placenta secretes hCG, colostrum supplies several antibodies (IgA) to the newborn, and the fimbriae collect the ovum after ovulation. Linking colostrum to ovum collection is clearly wrong.

87. Answer: (A) A is true but R is false.

Vertebrates have a notochord in the embryo that is replaced by a cartilaginous or bony vertebral column in the adult, so the assertion is true. The correct conclusion is that all vertebrates are chordates but not all chordates are vertebrates; the reason states the reverse, so it is false.

88. Answer: (D) B and E

The group A child must receive I^A from the mother and i from the father (B group father must be I^Bi), so valid trios are mother I^AI^A or I^Ai, father I^Bi, child I^Ai; these match the trios I^AI^A | I^Bi | I^Ai and I^Ai | I^Bi | I^Ai. A trio with an I^Bi child or an I^Bi mother contradicts the stated groups, and an I^BI^B father could only give an AB child, not an I^Ai child.

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

The neurotransmitter released at the neuromuscular junction generates an action potential in the sarcolemma, the rise in Ca^{++} lets calcium bind troponin on actin filaments, and myosin uses energy from ATP hydrolysis to form cross bridges. The signal from the CNS travels via a motor neuron, not a sensory neuron, and calcium causes unmasking, not masking, of the active sites on actin.

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

Squamous epithelium lines the walls of blood vessels, ciliated epithelium lines the inner surface of the Fallopian tubes, goblet cells of the alimentary canal are glandular epithelium, and compound epithelium lines the ducts of salivary glands and pancreatic ducts. Pancreatic ducts are not lined by squamous epithelium.

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

B-lymphocytes produce an army of antibodies in response to pathogens, interferons are part of the innate (cytokine) barrier, T-lymphocytes mediate cell-mediated immunity, and colostrum gives the newborn passive immunity through IgA. Calling colostrum innate immunity is the trap; the antibodies are received ready-made.

92. Answer: (C) Both A and R are true and R is the correct explanation of A.

About 20–25 per cent of CO_2 is carried by haemoglobin as carbamino-haemoglobin, and this binding depends on partial pressures: high pCO_2 and low pO_2 in the tissues favour CO_2 binding, while the reverse in the alveoli releases it. So both statements are true and the reason explains the assertion.

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