NEET 2023 — Biology Question Paper with Solutions

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

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1. Among ‘The Evil Quartet’, which one is considered the most important cause driving extinction of species?

(A) Over exploitation for economic gain
(B) Alien species invasions
(C) Co-extinctions
(D) Habitat loss and fragmentation

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2. Identify the pair of heterosporous pteridophytes among the following :

(A) Selaginella and Salvinia
(B) Psilotum and Salvinia
(C) Equisetum and Salvinia
(D) Lycopodium and Selaginella

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3. Frequency of recombination between gene pairs on same chromosome as a measure of the distance between genes to map their position on chromosome, was used for the first time by

(A) Sutton and Boveri
(B) Alfred Sturtevant
(C) Henking
(D) Thomas Hunt Morgan

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4. What is the function of tassels in the corn cob?

(A) To trap pollen grains
(B) To disperse pollen grains
(C) To protect seeds
(D) To attract insects

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5. Identify the correct statements :

A. Detritivores perform fragmentation.
B. The humus is further degraded by some microbes during mineralization.
C. Water soluble inorganic nutrients go down into the soil and get precipitated by a process called leaching.
D. The detritus food chain begins with living organisms.
E. Earthworms break down detritus into smaller particles by a process called catabolism.
Choose the correct answer from the options given below :

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

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6. Given below are two statements : One is labelled as Assertion A and the other is labelled as Reason R :
Assertion A : Late wood has fewer xylary elements with narrow vessels.
Reason R : Cambium is less active in winters.
In the light of the above statements, choose the correct answer from the options given below :

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

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7. The process of appearance of recombination nodules occurs at which sub stage of prophase I in meiosis?

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

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8. Which of the following stages of meiosis involves division of centromere?

(A) Metaphase II
(B) Anaphase II
(C) Telophase
(D) Metaphase I

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9. During the purification process for recombinant DNA technology, addition of chilled ethanol precipitates out

(A) DNA
(B) Histones
(C) Polysaccharides
(D) RNA

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10. Family Fabaceae differs from Solanaceae and Liliaceae. With respect to the stamens, pick out the characteristics specific to family Fabaceae but not found in Solanaceae or Liliaceae.

(A) Polyadelphous and epipetalous stamens
(B) Monoadelphous and Monothecous anthers
(C) Epiphyllous and Dithecous anthers
(D) Diadelphous and Dithecous anthers

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11. Large, colourful, fragrant flowers with nectar are seen in

(A) Bird pollinated plants
(B) Bat pollinated plants
(C) Wind pollinated plants
(D) Insect pollinated plants

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12. Spraying of which of the following phytohormone on juvenile conifers helps hastening the maturity period, that leads early seed production?

(A) Gibberellic Acid
(B) Zeatin
(C) Abscisic Acid
(D) Indole-3-butyric Acid

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13. Among eukaryotes, replication of DNA takes place in :

(A) S phase
(B) G1 phase
(C) G2 phase
(D) M phase

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14. How many ATP and $NADPH_2$ are required for the synthesis of one molecule of Glucose during Calvin cycle?

(A) 18 ATP and 12 NADPH2
(B) 12 ATP and 16 NADPH2
(C) 18 ATP and 16 NADPH2
(D) 12 ATP and 12 NADPH2

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15. In gene gun method used to introduce alien DNA into host cells, microparticles of _____ metal are used.

(A) Zinc
(B) Tungsten or gold
(C) Silver
(D) Copper

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16. Unequivocal proof that DNA is the genetic material was first proposed by

(A) Alfred Hershey and Martha Chase
(B) Avery, Macleoid and McCarthy
(C) Wilkins and Franklin
(D) Frederick Griffith

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17. In the equation GPP – R = NPP
GPP is Gross Primary Productivity
NPP is Net Primary Productivity
R here is _____.

(A) Respiratory quotient
(B) Respiratory loss
(C) Reproductive allocation
(D) Photosynthetically active radiation

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18. What is the role of RNA polymerase III in the process of transcription in Eukaryotes?

(A) Transcription of tRNA, 5S rRNA and snRNA
(B) Transcription of precursor of mRNA
(C) Transcription of only snRNAs
(D) Transcription of rRNAs (28S, 18S and 5.8S)

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19. In angiosperm, the haploid, diploid and triploid structures of a fertilized embryo sac sequentially are :

(A) Antipodals, synergids, and primary endosperm nucleus
(B) Synergids, Zygote and Primary endosperm nucleus
(C) Synergids, antipodals and Polar nuclei
(D) Synergids, Primary endosperm nucleus and zygote

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20. The phenomenon of pleiotropism refers to

(A) Presence of two alleles, each of the two genes controlling a single trait
(B) A single gene affecting multiple phenotypic expression
(C) More than two genes affecting a single character
(D) Presence of several alleles of a single gene controlling a single crossover

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21. Given below are two statements : One is labelled as Assertion A and the other is labelled as Reason R :
Assertion A : ATP is used at two steps in glycolysis.
Reason R : First ATP is used in converting glucose into glucose-6-phosphate and second ATP is used in conversion of fructose-6-phosphate into fructose-1, 6-diphosphate.
In the light of the above statements, choose the correct answer from the options given below :

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

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22. Cellulose does not form blue colour with Iodine because

(A) It is a helical molecule
(B) It does not contain complex helices and hence cannot hold iodine molecules
(C) It breaks down when iodine reacts with it
(D) It is a disaccharide

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23. Which hormone promotes internode/petiole elongation in deep water rice?

(A) Kinetin
(B) Ethylene
(C) 2, 4-D
(D) GA_3

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24. Expressed Sequence Tags (ESTs) refers to

(A) All genes that are expressed as proteins.
(B) All genes whether expressed or unexpressed.
(C) Certain important expressed genes.
(D) All genes that are expressed as RNA.

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25. Upon exposure to UV radiation, DNA stained with ethidium bromide will show

(A) Bright blue colour
(B) Bright yellow colour
(C) Bright orange colour
(D) Bright red colour

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26. The historic Convention on Biological Diversity, 'The Earth Summit' was held in Rio de Janeiro in the year

(A) 1992
(B) 1986
(C) 2002
(D) 1985

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27. The reaction centre in PS II has an absorption maxima at

(A) 700 nm
(B) 660 nm
(C) 780 nm
(D) 680 nm

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28. Given below are two statements : One labelled as Assertion A and the other labelled as Reason R:
Assertion A : The first stage of gametophyte in the life cycle of moss is protonema stage.
Reason R : Protonema develops directly from spores produced in capsule.
In the light of the above statements, choose the most appropriate answer from options given below:

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

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29. In tissue culture experiments, leaf mesophyll cells are put in a culture medium to form callus. This phenomenon may be called as

(A) Dedifferentiation
(B) Development
(C) Senescence
(D) Differentiation

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30. Given below are two statements :
Statement I : Endarch and exarch are the terms often used for describing the position of secondary xylem in the plant body.
Statement II : Exarch condition is the most common feature of the root system.
In the light of the above statements, choose the correct answer from the options given below:

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

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31. Match List I with List II:
List I List II
(A) M Phase (I) Proteins are synthesized
(B) G_2 Phase (II) Inactive phase
(C) Quiescent stage (III) Interval between mitosis and initiation of DNA replication
(D) G_1 Phase (IV) Equational division
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-II, B-IV, C-I, D-III
(D) A-III, B-II, C-IV, D-I

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32. Which of the following statements are correct about Klinefelter's Syndrome?

A. This disorder was first described by Langdon Down (1866).

B. Such an individual has overall masculine development. However, the feminine development is also expressed.

C. The affected individual is short statured.

D. Physical, psychomotor and mental development is retarded.

E. Such individuals are sterile.

Choose the correct answer from the options given below :

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

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33. Given below are two statements:

Statement I : Gause's 'Competitive Exclusion Principle' states that two closely related species competing for the same resources cannot co-exist indefinitely and competitively inferior one will be eliminated eventually.

Statement II : In general, carnivores are more adversely affected by competition than herbivores.

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

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

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34. How many different proteins does the ribosome consist of?

(A) 60
(B) 40
(C) 20
(D) 80

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35. Which of the following combinations is required for chemiosmosis?

(A) Membrane, proton pump, proton gradient, NADP synthase
(B) Proton pump, electron gradient, ATP synthase
(C) Proton pump, electron gradient, NADP synthase
(D) Membrane, proton pump, proton gradient, ATP synthase

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36. Match List I with List II:

List I (Interaction) – List II (Species A and B)

(A) Mutualism (I) +(A), 0(B)

(B) Commensalism (II) –(A), 0(B)

(C) Amensalism (III) +(A), –(B)

(D) Parasitism (IV) +(A), +(B)

Choose the correct answer from the options given below:

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

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37. Match List I with List II:

List I List II

(A) Oxidative decarboxylation (I) Citrate synthase

(B) Glycolysis (II) Pyruvate dehydrogenase

(C) Oxidative phosphorylation (III) Electron transport system

(D) Tricarboxylic acid cycle (IV) EMP pathway

Choose the correct answer from the options given below :

(A) A – II, B – IV, C – I, D – III

(B) A – III, B – I, C – II, D – IV

(C) A – II, B – IV, C – III, D – I

(D) A – III, B – IV, C – II, D – I

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

Assertion A : In gymnosperms the pollen grains are released from the microsporangium and carried by air currents.

Reason R : Air currents carry the pollen grains to the mouth of the archegonia where the male gametes are discharged and pollen tube is not formed.

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

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

(B) A is true but R is false

(C) A is false but R is true

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

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

Assertion A : A flower is defined as modified shoot wherein the shoot apical meristem changes to floral meristem.

Reason R : Internode of the shoot gets condensed to produce different floral appendages laterally at successive node instead of leaves.

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

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

(B) A is true but R is false

(C) A is false but R is true

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

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40. Malonate inhibits the growth of pathogenic bacteria by inhibiting the activity of

(A) Amylase

(B) Lipase

(C) Dinitrogenase

(D) Succinic dehydrogenase

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41. Given below are two statements:
Statement I: A protein is imagined as a line, the left end represented by first amino acid (C-terminal) and the right end represented by last amino acid (N-terminal).
Statement II: Adult human haemoglobin, consists of 4 subunits (two subunits of α type and two subunits of β type.)
In the light of the above statements, choose the correct answer from the options given below:

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

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42. Radial symmetry is NOT found in adults of phylum _____.

(A) Hemichordata
(B) Coelenterata
(C) Echinodermata
(D) Ctenophora

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43. Which of the following statements are correct regarding female reproductive cycle?
A. In non-primate mammals cyclical changes during reproduction are called oestrus cycle.
B. First menstrual cycle begins at puberty and is called menopause.
C. Lack of menstruation may be indicative of pregnancy.
D. Cyclic menstruation extends between menarche and menopause.
Choose the most appropriate answer from the options given below:

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

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44. Given below are two statements: one is labelled as Assertion A and the other is labelled as Reason R.
Assertion A : Nephrons are of two types: Cortical & Juxta medullary, based on their relative position in cortex and medulla.
Reason R : Juxta medullary nephrons have short loop of Henle whereas, cortical nephrons have longer loop of Henle.
In the light of the above statements, choose the correct answer from the options given below :

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

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45. Which of the following are NOT considered as the part of endomembrane system?

A. Mitochondria
B. Endoplasmic reticulum
C. Chloroplasts
D. Golgi complex
E. Peroxisomes

Choose the most appropriate answer from the options given below:

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

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46. Broad palm with single palm crease is visible in a person suffering from-

(A) Turner's syndrome
(B) Klinefelter's syndrome
(C) Thalassemia
(D) Down's syndrome

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47. Match List I with List II.

List I List II
(A) P-wave (I) Beginning of systole
(B) Q-wave (II) Repolarisation of ventricles
(C) QRS complex (III) Depolarisation of atria
(D) T-wave (IV) Depolarisation of ventricles

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

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48. Which one of the following common sexually transmitted diseases is completely curable when detected early and treated properly?

(A) Gonorrhoea
(B) Hepatitis-B
(C) HIV Infection
(D) Genital herpes

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

Assertion A: Endometrium is necessary for implantation of blastocyst.
Reason R: In the absence of fertilization, the corpus luteum degenerates that causes disintegration of endometrium.

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

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

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50. Which of the following is not a cloning vector?

(A) YAC
(B) pBR322
(C) Probe
(D) BAC

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51. Match List I with List II.

List I List II

(A) Taenia (I) Nephridia

(B) Paramoecium (II) Contractile vacuole

(C) Periplaneta (III) Flame cells

(D) Pheretima (IV) Urecose gland

Choose the correct answer from the options given below :

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

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52. Given below are two statements:

Statement I : Ligaments are dense irregular tissue.

Statement II : Cartilage is dense regular tissue.

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

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

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53. Which of the following functions is carried out by cytoskeleton in a cell?

(A) Protein synthesis
(B) Motility
(C) Transportation
(D) Nuclear division

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54. Match List I with List II.

List I List II

(A) Gene 'a' (I) β-galactosidase

(B) Gene 'y' (II) Transacetylase

(C) Gene 'i' (III) Permease

(D) Gene 'z' (IV) Repressor protein

Choose the correct answer from the options given below :

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

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55. Which one of the following techniques does not serve the purpose of early diagnosis of a disease for its early treatment?

(A) Serum and Urine analysis
(B) Polymerase Chain Reaction (PCR) technique
(C) Enzyme Linked Immuno-Sorbent Assay (ELISA) technique
(D) Recombinant DNA Technology

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56. Given below are two statements :
Statement I : Low temperature preserves the enzyme in a temporarily inactive state whereas high temperature destroys enzymatic activity because proteins are denatured by heat.
Statement II : When the inhibitor closely resembles the substrate in its molecular structure and inhibits the activity of the enzyme, it is known as competitive inhibitor.
In the light of the above statements, choose the correct answer from the options given below:

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

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57. Match List I with List II.
List I (Type of Joint) – List II (Found between)
(A) Cartilaginous Joint (I) Between flat skull bones
(B) Ball and Socket Joint (II) Between adjacent vertebrae in vertebral column
(C) Fibrous Joint (III) Between carpal and metacarpal of thumb
(D) Saddle joint (IV) Between Humerus and Pectoral girdle
Choose the correct answer from the options given below:

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

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58. Given below are two statements:
Statement I: Vas deferens receives a duct from seminal vesicle and opens into urethra as the ejaculatory duct.
Statement II: The cavity of the cervix is called cervical canal which along with vagina forms birth canal.
In the light of the above statements, choose the correct answer from the options given below:

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

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59. In which blood corpuscles, the HIV undergoes replication and produces progeny viruses?

(A) B-lymphocytes
(B) Basophils
(C) Eosinophils
(D) TH cells

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60. Match List I with List II.

List I List II

(A) Heroin (I) Effect on cardiovascular system

(B) Marijuana (II) Slow down body function

(C) Cocaine (III) Painkiller

(D) Morphine (IV) Interfere with transport of dopamine

Choose the correct answer from the options given below:

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

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

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

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

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61. Vital capacity of lung is _____.

(A) IRV + ERV + TV + RV

(B) IRV + ERV + TV – RV

(C) IRV + ERV + TV

(D) IRV + ERV

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62. Select the correct group/set of Australian Marsupials exhibiting adaptive radiation.

(A) Numbat, Spotted cuscus, Flying phalanger

(B) Mole, Flying squirrel, Tasmanian tiger cat

(C) Lemur, Anteater, Wolf

(D) Tasmanian wolf, Bobcat, Marsupial mole

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

Assertion A : Amniocentesis for sex determination is one of the strategies of Reproductive and Child Health Care Programme.

Reason R : Ban on amniocentesis checks increasing menace of female foeticide.

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 NOT the correct explanation of A.

(B) A is true but R is false.

(C) A is false but R is true.

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

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64. Given below are two statements:

Statement I: RNA mutates at a faster rate.

Statement II: Viruses having RNA genome and shorter life span mutate and evolve faster.

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

(A) Both Statement I and Statement II are false.

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

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

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

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65. Match List I with List II.

List I List II

(A) Vasectomy (I) Oral method

(B) Coitus interruptus (II) Barrier method

(C) Cervical caps (III) Surgical method

(D) Saheli (IV) Natural method

Choose the correct answer from the options given below:

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

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

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

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

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66. Given below are two statements:

Statement I: In prokaryotes, the positively charged DNA is held with some negatively charged proteins in a region called nucleoid.

Statement II: In eukaryotes, the negatively charged DNA is wrapped around the positively charged histone octamer to form nucleosome.

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

(A) Both Statement I and Statement II are false.

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

(C) Statement I is incorrect but Statement II is true.

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

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67. Match List I with List II.

List I List II

(A) Ringworm (I) Haemophilus influenzae

(B) Filariasis (II) Trichophyton

(C) Malaria (III) Wuchereria bancrofti

(D) Pneumonia (IV) Plasmodium vivax

Choose the correct answer from the options given below:

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

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

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

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

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68. Match List I with List II.

List I (Interacting species) – List II (Name of interaction)

(A) A Leopard and a Lion in a forest/grassland (I) Competition

(B) A Cuckoo laying egg in a Crow's nest (II) Brood parasitism

(C) Fungi and root of a higher plant in Mycorrhizae (III) Mutualism

(D) A cattle egret and a Cattle in a field (IV) Commensalism

Choose the correct answer from the options given below.

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

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

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

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

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69. Which of the following statements are correct?

A. Basophils are most abundant cells of the total WBCs

B. Basophils secrete histamine, serotonin and heparin

C. Basophils are involved in inflammatory response

D. Basophils have kidney shaped nucleus

E. Basophils are agranulocytes

Choose the correct answer from the options given below:

(A) C and E only

(B) B and C only

(C) A and B only

(D) D and E only

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70. Match List I with List II.

List I List II

(A) Mast cells (I) Ciliated epithelium

(B) Inner surface of bronchiole (II) Areolar connective tissue

(C) Blood (III) Cuboidal epithelium

(D) Tubular parts of nephron (IV) Specialised connective tissue

Choose the correct answer from the options given below:

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

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

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

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

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71. Select the correct statements.

A. Tetrad formation is seen during Leptotene.

B. During Anaphase, the centromeres split and chromatids separate.

C. Terminalization takes place during Pachytene.

D. Nucleolus, Golgi complex and ER are reformed during Telophase.

E. Crossing over takes place between sister chromatids of homologous chromosome.

Choose the correct answer from the options given below:

(A) B and D only

(B) A, C and E only

(C) B and E only

(D) A and C only

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72. In cockroach, excretion is brought about by -

A. Phallic gland

B. Urecose gland

C. Nephrocytes

D. Fat body

E. Collaterial glands

Choose the correct answer from the options given below :

(A) A, B and E only

(B) B, C and D only

(C) B and D only

(D) A and E only

NEET 2023

73. Given below are two statements:
Statement I : During G_0 phase of cell cycle, the cell is metabolically inactive.
Statement II : The centrosome undergoes duplication during S phase of interphase.
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 incorrect.
(B) Statement I is correct but Statement II is incorrect.
(C) Statement I is incorrect but Statement II is correct.
(D) Both Statement I and Statement II are correct.

NEET 2023

74. Select the correct statements with reference to chordates.
A. Presence of a mid-dorsal, solid and double nerve cord.
B. Presence of closed circulatory system.
C. Presence of paired pharyngeal gill slits.
D. Presence of dorsal heart
E. Triploblastic pseudocoelomate animals.
Choose the correct answer from the options given below:

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

NEET 2023

75. Match List I with List II.
List I List II
(A) Logistic growth (I) Unlimited resource availability condition
(B) Exponential growth (II) Limited resource availability condition
(C) Expanding age pyramid (III) The percent individuals of pre-reproductive age is largest followed by reproductive and post reproductive age groups
(D) Stable age pyramid (IV) The percent individuals of pre-reproductive and reproductive age group are same
Choose the correct answer from the options given below:

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

NEET 2023

76. Which one of the following is the sequence on corresponding coding strand, if the sequence on mRNA formed is as follows 5'AUCGAUCGAUCGAUCGAUCGAUCGAUCG 3'?

(A) 3' UAGCUAGCUAGCUAGCUAGCUAGCUAGC 5'
(B) 5' ATCGATCGATCGATCGATCGATCGATCG 3'
(C) 3' ATCGATCGATCGATCGATCGATCGATCG 5'
(D) 5' UAGCUAGCUAGCUAGCUAGCUAGCUAGC 3'

NEET 2023

77. Which of the following is characteristic feature of cockroach regarding sexual dimorphism?

(A) Presence of anal styles
(B) Presence of sclerites
(C) Presence of anal cerci
(D) Dark brown body colour and anal cerci

NEET 2023

78. Which of the following statements are correct regarding skeletal muscle?

A. Muscle bundles are held together by collagenous connective tissue layer called fascicle.

B. Sarcoplasmic reticulum of muscle fibre is a store house of calcium ions.

C. Striated appearance of skeletal muscle fibre is due to distribution pattern of actin and myosin proteins.

D. M line is considered as functional unit of contraction called sarcomere.

Choose the most appropriate answer from the options given below:

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

NEET 2023

79. The unique mammalian characteristics are :

(A) hairs, pinna and mammary glands
(B) hairs, pinna and indirect development
(C) pinna, monocondylic skull and mammary glands
(D) hairs, tympanic membrane and mammary glands

NEET 2023

80. The parts of human brain that helps in regulation of sexual behaviour, expression of excitement, pleasure, rage, fear etc. are:

(A) Corpora quadrigemina and hippocampus
(B) Brain stem and epithalamus
(C) Corpus callosum and thalamus
(D) Limbic system and hypothalamus

NEET 2023

81. Which of the following statements are correct?

A. An excessive loss of body fluid from the body switches off osmoreceptors.

B. ADH facilitates water reabsorption to prevent diuresis.

C. ANF causes vasodilation.

D. ADH causes increase in blood pressure.

E. ADH is responsible for decrease in GFR.

Choose the correct answer from the options given below:

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

NEET 2023

82. Which of the following are NOT under the control of thyroid hormone?

A. Maintenance of water and electrolyte balance

B. Regulation of basal metabolic rate

C. Normal rhythm of sleep-wake cycle

D. Development of immune system

E. Support the process of RBCs formation

Choose the correct answer from the options given below:

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

NEET 2023

83. Movement and accumulation of ions across a membrane against their concentration gradient can be explained by

(A) Facilitated Diffusion
(B) Passive Transport
(C) Active Transport
(D) Osmosis

NEET 2023

84. Axile placentation is observed in

(A) China rose, Beans and Lupin
(B) Tomato, Dianthus and Pea
(C) China rose, Petunia and Lemon
(D) Mustard, Cucumber and Primrose

NEET 2023

85. The thickness of ozone in a column of air in the atmosphere is measured in terms of :

(A) Decibels
(B) Decameter
(C) Kilobase
(D) Dobson units

NEET 2023

86. Which micronutrient is required for splitting of water molecule during photosynthesis?

(A) Molybdenum
(B) Magnesium
(C) Copper
(D) Manganese

NEET 2023

87. Given below are two statements :
Statement I : The forces generated by transpiration can lift a xylem-sized column of water over 130 meters height.
Statement II : Transpiration cools leaf surfaces sometimes 10 to 15 degrees by evaporative cooling.
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 incorrect
(B) Statement I is correct but Statement II is incorrect
(C) Statement I is incorrect but Statement II is correct
(D) Both Statement I and Statement II are correct

NEET 2023

88. Identify the correct statements:
A. Lenticels are the lens-shaped openings permitting the exchange of gases.
B. Bark formed early in the season is called hard bark.
C. Bark is a technical term that refers to all tissues exterior to vascular cambium.
D. Bark refers to periderm and secondary phloem.
E. Phellogen is single-layered in thickness.
Choose the correct answer from the options given below:

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

NEET 2023

89. Match List I with List II :

List I List II

(A) Cohesion (I) More attraction in liquid phase

(B) Adhesion (II) Mutual attraction among water molecules

(C) Surface tension (III) Water loss in liquid phase

(D) Guttation (IV) Attraction towards polar surfaces

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 – I, C – IV, D – III

(D) A – II, B – IV, C – I, D – III

NEET 2023

90. Which one of the following statements is NOT correct?

(A) Algal blooms caused by excess of organic matter in water improve water quality and promote fisheries

(B) Water hyacinth grows abundantly in eutrophic water bodies and leads to an imbalance in the ecosystem dynamics of the water body

(C) The amount of some toxic substances of industrial waste water increases in the organisms at successive trophic levels

(D) The micro-organisms involved in biodegradation of organic matter in a sewage polluted water body consume a lot of oxygen causing the death of aquatic organisms

NEET 2023

91. Match List I with List II:

List I List II

(A) Iron (I) Synthesis of auxin

(B) Zinc (II) Component of nitrate reductase

(C) Boron (III) Activator of catalase

(D) Molybdenum (IV) Cell elongation and differentiation

Choose the correct answer from the options given below:

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

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

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

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

NEET 2023

92. Match List I with List II with respect to human eye.

List I List II

(A) Fovea (I) Visible coloured portion of eye that regulates diameter of pupil.

(B) Iris (II) External layer of eye formed of dense connective tissue.

(C) Blind spot (III) Point of greatest visual acuity or resolution.

(D) Sclera (IV) Point where optic nerve leaves the eyeball and photoreceptor cells are absent.

Choose the correct answer from the options given below:

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

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

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

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

NEET 2023

93. Match List I with List II

List I (Cells) – List II (Secretion)

(A) Peptic cells (I) Mucus

(B) Goblet cells (II) Bile juice

(C) Oxyntic cells (III) Proenzyme pepsinogen

(D) Hepatic cells (IV) HCl and intrinsic factor for absorption of vitamin B_{12}

Choose the correct answer from the options given below:

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

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

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

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

NEET 2023

94. Which of the following statements is correct?

(A) Biomagnification refers to increase in concentration of the toxicant at successive trophic levels.

(B) Presence of large amount of nutrients in water restricts 'Algal Bloom'

(C) Algal Bloom decreases fish mortality

(D) Eutrophication refers to increase in domestic sewage and waste water in lakes.

NEET 2023

95. Once the undigested and unabsorbed substances enter the caecum, their backflow is prevented by

(A) Ileo-caecal valve

(B) Gastro-oesophageal sphincter

(C) Pyloric sphincter

(D) Sphincter of Oddi

NEET 2023

96. Match List I with List II.

List I List II

(A) CCK (I) Kidney

(B) GIP (II) Heart

(C) ANF (III) Gastric gland

(D) ADH (IV) Pancreas

Choose the correct answer from the options given below :

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

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

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

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

NEET 2023

97. Given below are two statements:

Statement I: Electrostatic precipitator is most widely used in thermal power plant.

Statement II : Electrostatic precipitator in thermal power plant removes ionising radiations.

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 incorrect.

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

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

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

Answer key and explanations

1. Answer: (D) Habitat loss and fragmentation

Habitat loss and fragmentation is the most important of the four causes in the Evil Quartet, as seen in the clearing of tropical rain forests that destroys the homes of countless species at once. Over-exploitation, alien species invasions and co-extinctions are real causes but act on fewer species.

2. Answer: (A) Selaginella and Salvinia

Selaginella (a lycophyte) and Salvinia (a water fern) both produce two kinds of spores, small microspores and large megaspores, so both are heterosporous. Psilotum, Equisetum and Lycopodium are homosporous, so every other pair contains a homosporous genus.

3. Answer: (B) Alfred Sturtevant

Alfred Sturtevant, a student of Morgan, used the frequency of recombination between gene pairs on the same chromosome as a measure of the distance between them and prepared the first chromosome maps. Morgan discovered linkage and recombination in Drosophila but did not map the genes himself.

4. Answer: (A) To trap pollen grains

In maize the tassels of the cob are the long styles and stigmas, which wave in the wind and trap airborne pollen grains, an adaptation for wind pollination. They do not disperse pollen (that is done by the male inflorescence) and wind-pollinated flowers do not need to attract insects.

5. Answer: (D) A, B, C only

Detritivores such as earthworms do fragmentation, humus is further degraded by microbes during mineralization, and water-soluble inorganic nutrients going down into the soil and getting precipitated is leaching, so these three are correct. The detritus food chain begins with dead organic matter, not living organisms, and breaking detritus into smaller particles is fragmentation, not catabolism.

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

In winter the cambium is less active and forms late (autumn) wood, which has fewer xylary elements with narrow vessels; in spring the more active cambium forms early wood with wide vessels. So the assertion is true and the reduced cambial activity in winter is exactly why late wood is like this.

7. Answer: (A) Pachytene

Recombination nodules, the sites where crossing over between non-sister chromatids occurs, appear during pachytene, after synapsis is completed in zygotene. Diplotene shows chiasmata after the synaptonemal complex dissolves, and diakinesis shows terminalisation.

8. Answer: (B) Anaphase II

In anaphase II the centromere of each chromosome splits, so that the sister chromatids separate and move to opposite poles. In anaphase I only homologous chromosomes separate, with their centromeres intact, and metaphase stages only align chromosomes.

9. Answer: (A) DNA

After the cell is lysed and RNA, proteins and other molecules are removed with enzymes, adding chilled ethanol makes the purified DNA come out of solution as fine threads. RNA is removed earlier by ribonuclease, and histones are removed by protease.

10. Answer: (D) Diadelphous and Dithecous anthers

Fabaceae has ten stamens in two bundles (9 + 1), the diadelphous condition, with dithecous anthers. Solanaceae has epipetalous stamens and Liliaceae has epiphyllous (epitepalous) stamens, and polyadelphous or monothecous conditions are found in other families such as citrus and China rose.

11. Answer: (D) Insect pollinated plants

Insect-pollinated flowers are generally large, colourful and fragrant and rich in nectar, which attracts the insects that carry the pollen. Wind-pollinated flowers are small, dull and without nectar or scent.

12. Answer: (A) Gibberellic Acid

Spraying gibberellins on juvenile conifers hastens their maturity period and so leads to early seed production. Zeatin is a cytokinin, abscisic acid promotes dormancy, and indole-3-butyric acid is an auxin used mainly for rooting cuttings.

13. Answer: (A) S phase

DNA replication takes place in the S (synthesis) phase of interphase, when the DNA content doubles from 2C to 4C. G1 and G2 are growth phases on either side of S, and M phase is the actual division.

14. Answer: (A) 18 ATP and 12 NADPH2

Fixing one CO_2 in the Calvin cycle needs 3 ATP and 2 NADPH, and a glucose molecule needs six turns of the cycle, so $6 \times 3 = 18$ ATP and $6 \times 2 = 12$ NADPH are used. The other combinations do not match these 3:2 per-CO_2 requirements.

15. Answer: (B) Tungsten or gold

In the biolistic or gene gun method, cells are bombarded with high-velocity microparticles of gold or tungsten coated with DNA. These dense, inert metals carry the DNA into the cell, while zinc, silver and copper are not used.

16. Answer: (A) Alfred Hershey and Martha Chase

Hershey and Chase (1952) used bacteriophages labelled with radioactive phosphorus (in DNA) or sulphur (in protein) and showed that only the DNA entered the bacteria, giving the unequivocal proof that DNA is the genetic material. Griffith only showed a 'transforming principle', and Avery, MacLeod and McCarty's evidence that it was DNA was not accepted by everyone.

17. Answer: (B) Respiratory loss

Net primary productivity is gross primary productivity minus the energy the plants use up in their own respiration, so R is the respiratory loss. Respiratory quotient is a ratio of CO_2 released to O_2 used, and photosynthetically active radiation is the light input, not a loss.

18. Answer: (A) Transcription of tRNA, 5S rRNA and snRNA

In eukaryotes RNA polymerase III transcribes tRNA, 5S rRNA and snRNAs. RNA polymerase I makes the 28S, 18S and 5.8S rRNAs and RNA polymerase II makes the precursor of mRNA (hnRNA).

19. Answer: (B) Synergids, Zygote and Primary endosperm nucleus

In the fertilised embryo sac the synergids are haploid (n), the zygote formed by syngamy is diploid (2n), and the primary endosperm nucleus formed by triple fusion is triploid (3n). Antipodals are haploid and polar nuclei are haploid each, so the other sequences put the wrong ploidy in place.

20. Answer: (B) A single gene affecting multiple phenotypic expression

Pleiotropy is when a single gene affects several phenotypic traits, as in phenylketonuria where one mutant gene causes mental retardation and reduced hair and skin pigmentation. Many genes controlling one trait is polygenic inheritance, and several alleles of one gene is multiple allelism.

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

Glycolysis uses ATP at two steps: when glucose is phosphorylated to glucose-6-phosphate and when fructose-6-phosphate is phosphorylated to fructose-1,6-bisphosphate. The reason names exactly these two steps, so it correctly explains the assertion.

22. Answer: (B) It does not contain complex helices and hence cannot hold iodine molecules

Starch forms helical secondary structures that can hold iodine molecules, giving a blue colour. Cellulose is a straight-chain polymer of glucose without such complex helices, so it cannot hold iodine. Cellulose is a polysaccharide, not a disaccharide.

23. Answer: (B) Ethylene

Ethylene promotes rapid internode and petiole elongation in deep-water rice plants, which keeps their leaves and upper parts above the water. GA_3 causes stem elongation in general, but this specific response of deep-water rice is due to ethylene.

24. Answer: (D) All genes that are expressed as RNA.

In the Human Genome Project one approach identified all the genes that are expressed as RNA, and these are called Expressed Sequence Tags (ESTs). The other approach, sequence annotation, sequences the whole genome whether coding or not. ESTs are not limited to genes expressed as proteins.

25. Answer: (C) Bright orange colour

Ethidium bromide intercalates into DNA, and when the gel is exposed to UV light the DNA bands show a bright orange colour. That is how separated DNA fragments are seen after agarose gel electrophoresis.

26. Answer: (A) 1992

The Earth Summit on biological diversity was held in Rio de Janeiro in 1992, where nations were asked to take measures to conserve biodiversity. 2002 was the World Summit on Sustainable Development in Johannesburg.

27. Answer: (D) 680 nm

The reaction centre chlorophyll a of photosystem II absorbs maximally at 680 nm and is called P680. The reaction centre of photosystem I absorbs at 700 nm (P700).

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

In mosses the spore germinates to form the protonema, a creeping green filamentous stage, which is the first stage of the gametophyte. The protonema develops directly from the spore, so the reason is true and explains why it is the first stage.

29. Answer: (A) Dedifferentiation

Mesophyll cells are already differentiated and have lost the ability to divide; when they regain that ability and form an undifferentiated callus in culture, the process is dedifferentiation. Differentiation is the opposite change, from meristematic to mature cells.

30. Answer: (C) Statement I is incorrect but Statement II is true

Endarch and exarch describe the position of protoxylem in the primary xylem, not the secondary xylem, so the first statement is incorrect. In roots the protoxylem lies towards the periphery, so the exarch condition is typical of roots and the second statement is true.

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

M phase is the equational division, G_2 is the phase in which proteins are synthesised in preparation for mitosis, the quiescent stage (G_0) is an inactive phase, and G_1 is the interval between mitosis and the start of DNA replication. The trap is to swap G_1 and G_2, but replication starts only after G_1.

32. Answer: (B) B and E only

Klinefelter's syndrome (47, XXY) shows overall masculine development with some feminine features such as enlarged breasts (gynaecomastia), and the individuals are sterile. Langdon Down described Down's syndrome, whose patients are short-statured with retarded physical, psychomotor and mental development, so those statements do not fit Klinefelter's syndrome.

33. Answer: (B) Statement I is correct but Statement II is false.

Gause's competitive exclusion principle says two closely related species competing for the same limiting resource cannot co-exist indefinitely and the weaker one is eliminated, so the first statement is correct. In general herbivores and plants are more adversely affected by competition than carnivores, so the second statement is false.

34. Answer: (D) 80

The ribosome is made of structural RNAs and about 80 different proteins. The two subunits are often confused with these counts, but 60 and 40 refer to the S values of the eukaryotic subunits (60S and 40S), not to numbers of proteins.

35. Answer: (D) Membrane, proton pump, proton gradient, ATP synthase

Chemiosmosis needs a membrane, a proton pump, a proton gradient across that membrane, and ATP synthase through which protons flow back to make ATP. NADP synthase is not part of it, and the gradient is of protons, not electrons.

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

Mutualism benefits both species (+, +), commensalism benefits one with no effect on the other (+, 0), amensalism harms one with no effect on the other (–, 0) and parasitism benefits the parasite and harms the host (+, –). The trap is to give amensalism the (+, 0) sign of commensalism.

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

Oxidative decarboxylation of pyruvate is catalysed by pyruvate dehydrogenase, glycolysis is the EMP pathway, oxidative phosphorylation is linked to the electron transport system, and the TCA cycle starts with citrate synthase. The trap is to link citrate synthase to oxidative phosphorylation.

38. Answer: (B) A is true but R is false

In gymnosperms the pollen grains are released from the microsporangium and carried by air currents to the ovule, so the assertion is true. The pollen then forms a pollen tube that carries the male gametes towards the archegonia, so the reason that no pollen tube forms is false.

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

A flower is a modified shoot in which the shoot apical meristem changes into a floral meristem. The internodes do not elongate and the axis gets condensed, so the floral appendages arise laterally at successive nodes instead of leaves; this is what makes the flower a modified shoot.

40. Answer: (D) Succinic dehydrogenase

Malonate closely resembles succinate in structure and competes for the active site of succinic dehydrogenase, a classic example of competitive inhibition. It does not act on amylase, lipase or dinitrogenase.

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

A protein is imagined as a line whose left end is the first amino acid, the N-terminal, and whose right end is the last amino acid, the C-terminal, so the first statement has the ends reversed. Adult human haemoglobin has four subunits, two of α type and two of β type, so the second statement is true.

42. Answer: (A) Hemichordata

Hemichordates are bilaterally symmetrical worm-like animals. Coelenterates and ctenophores are radially symmetrical, and adult echinoderms are radially symmetrical too (their larvae are bilateral).

43. Answer: (C) A, C and D only

Cyclical reproductive changes in non-primate mammals are called the oestrus cycle, lack of menstruation may indicate pregnancy, and cyclic menstruation runs from menarche to menopause. The first menstruation at puberty is called menarche, not menopause.

44. Answer: (B) A is true but R is false.

Nephrons are classified as cortical and juxtamedullary by their position in the cortex and medulla, so the assertion is true. It is the juxtamedullary nephrons that have long loops of Henle dipping deep into the medulla, while cortical nephrons have short loops, so the reason is reversed and false.

45. Answer: (A) A, C and E only

The endomembrane system includes the endoplasmic reticulum, Golgi complex, lysosomes and vacuoles, whose functions are coordinated. Mitochondria, chloroplasts and peroxisomes work independently of these and are not part of it.

46. Answer: (D) Down’s syndrome

Down's syndrome (trisomy 21) is marked by a broad palm with a characteristic single palm crease, short stature, a furrowed tongue and partly open mouth. Turner's and Klinefelter's syndromes are sex chromosome disorders without this palm feature, and thalassemia is a blood disorder.

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

In the ECG the P-wave shows depolarisation of the atria, the QRS complex shows depolarisation of the ventricles, the T-wave shows repolarisation of the ventricles, and the Q-wave marks the beginning of systole. The trap is to match the T-wave with depolarisation.

48. Answer: (A) Gonorrhoea

Gonorrhoea is caused by a bacterium and is completely curable when detected early and treated properly. Hepatitis-B, genital herpes and HIV infection are viral and are not completely curable.

49. Answer: (A) Both A and R are true but R is NOT the correct explanation of A.

The blastocyst gets embedded in the endometrium, so the endometrium is necessary for implantation. Without fertilisation the corpus luteum degenerates and the endometrium disintegrates, which is also true but explains menstruation, not why implantation needs the endometrium.

50. Answer: (C) Probe

A probe is a labelled single-stranded piece of DNA or RNA used to detect a complementary sequence, not a vehicle for carrying DNA. YAC, BAC and the plasmid pBR322 are all cloning vectors.

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

Taenia (a flatworm) excretes through flame cells, Paramoecium removes water through its contractile vacuole, Periplaneta has urecose glands, and Pheretima excretes through nephridia. The trap is to give nephridia to Taenia.

52. Answer: (A) Both Statement I and Statement II are false

Tendons and ligaments are dense regular connective tissue with parallel collagen fibres, so the first statement is false. Cartilage is a specialised connective tissue, not dense regular tissue, so the second statement is also false.

53. Answer: (B) Motility

The cytoskeleton of microtubules, microfilaments and intermediate filaments gives mechanical support, helps in motility and maintains cell shape. Protein synthesis is done by ribosomes, not the cytoskeleton.

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

In the lac operon the i gene codes for the repressor, z for β-galactosidase, y for permease and a for transacetylase. The common trap is to swap the y and a gene products.

55. Answer: (A) Serum and Urine analysis

With conventional methods such as serum and urine analysis a disease cannot be detected early, because the pathogen must already be present in large numbers. Recombinant DNA technology, PCR and ELISA can detect very small amounts of the pathogen or its products and so allow early diagnosis.

56. Answer: (D) Both Statement I and Statement II are true.

Low temperature keeps an enzyme temporarily inactive while high temperature denatures the protein and destroys its activity, so the first statement is true. An inhibitor that closely resembles the substrate and competes for the active site is a competitive inhibitor, so the second statement is true too.

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

Cartilaginous joints occur between adjacent vertebrae, the ball and socket joint between the humerus and pectoral girdle, fibrous joints between the flat skull bones, and the saddle joint between the carpal and metacarpal of the thumb. The trap is to call the skull joints saddle joints.

58. Answer: (D) Both Statement I and Statement II are true.

Each vas deferens receives a duct from the seminal vesicle and opens into the urethra as the ejaculatory duct. The cavity of the cervix is the cervical canal, which together with the vagina forms the birth canal, so both statements are true.

59. Answer: (D) TH cells

After entering the body HIV infects macrophages and then helper T-lymphocytes (TH cells), where it replicates and releases progeny viruses, steadily lowering the TH cell count. B-lymphocytes, basophils and eosinophils are not its replication sites.

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

Heroin is a depressant that slows down body functions, marijuana (cannabinoids) affects the cardiovascular system, cocaine interferes with the transport of dopamine, and morphine is an effective painkiller. The trap is to call heroin the painkiller and morphine the depressant.

61. Answer: (C) IRV + ERV + TV

Vital capacity is the maximum air that can be breathed out after a forced inspiration, which is ERV + TV + IRV. Adding residual volume gives total lung capacity, and IRV + ERV alone leaves out the tidal volume.

62. Answer: (A) Numbat, Spotted cuscus, Flying phalanger

The numbat (banded anteater), spotted cuscus and flying phalanger are all Australian marsupials that arose by adaptive radiation from a common ancestor. The mole, flying squirrel, lemur, anteater, wolf and bobcat are placental mammals.

63. Answer: (C) A is false but R is true.

Amniocentesis for sex determination is not a strategy of the RCH programme; a statutory ban on it is the strategy, so the assertion is false. The ban checks the increasing menace of female foeticide, so the reason is true.

64. Answer: (D) Both Statement I and Statement II are true.

RNA is less stable chemically than DNA and mutates at a faster rate. So viruses with an RNA genome and a short life span mutate and evolve faster, and both statements are true.

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

Vasectomy is a surgical method, coitus interruptus is a natural method, cervical caps are a barrier method, and Saheli is an oral contraceptive pill. The trap is to call cervical caps an oral method.

66. Answer: (C) Statement I is incorrect but Statement II is true.

DNA is negatively charged because of its phosphate groups, so in prokaryotes it is held with some positively charged proteins in the nucleoid; the first statement has the charges reversed. In eukaryotes the negatively charged DNA wraps around the positively charged histone octamer to form a nucleosome, so the second statement is correct.

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

Ringworm is caused by fungi such as Trichophyton, filariasis by Wuchereria bancrofti, malaria by Plasmodium vivax, and pneumonia by Haemophilus influenzae. The trap is to swap the malaria and pneumonia pathogens.

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

A leopard and a lion in the same area compete for prey, a cuckoo laying eggs in a crow's nest is brood parasitism, fungi with plant roots in mycorrhizae are mutualism, and the cattle egret feeding on insects disturbed by grazing cattle is commensalism. The trap is to swap mutualism and commensalism.

69. Answer: (B) B and C only

Basophils secrete histamine, serotonin and heparin and are involved in inflammatory reactions. They are the least abundant WBCs, have a lobed (not kidney-shaped) nucleus and are granulocytes, so the other statements are wrong.

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

Mast cells are found in areolar connective tissue, the inner surface of bronchioles is lined by ciliated epithelium, blood is a specialised connective tissue, and the tubular parts of the nephron are lined by cuboidal epithelium. The trap is to link blood with areolar tissue.

71. Answer: (A) B and D only

In anaphase the centromeres split and chromatids separate, and in telophase the nucleolus, Golgi complex and ER reform, so these two are correct. Tetrads (bivalents) are seen in zygotene–pachytene, not leptotene; terminalisation occurs in diakinesis; and crossing over is between non-sister chromatids.

72. Answer: (B) B, C and D only

In cockroach, excretion is by Malpighian tubules helped by the fat body, nephrocytes and urecose (uricose) glands. Phallic and collaterial glands are reproductive glands, not excretory.

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

Cells in the G_0 (quiescent) phase remain metabolically active but do not proliferate, so the first statement is incorrect. In animal cells the centriole/centrosome duplicates in the cytoplasm during the S phase, so the second statement is correct.

74. Answer: (A) B and C only

Chordates have a closed circulatory system and paired pharyngeal gill slits. Their nerve cord is dorsal, hollow and single, their heart is ventral, and they are triploblastic coelomates, so those statements are wrong.

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

Logistic growth occurs when resources are limited and exponential growth when they are unlimited. An expanding age pyramid has the largest share of pre-reproductive individuals, followed by reproductive and post-reproductive ones, while a stable pyramid has similar shares of pre-reproductive and reproductive individuals.

76. Answer: (B) 5’ ATCGATCGATCGATCGATCGATCGATCG 3’

The coding strand has the same sequence and polarity as the mRNA except that thymine replaces uracil, so it reads 5' ATCGATCGATCGATCGATCGATCGATCG 3'. A strand written 3'→5' with ATCG is the wrong polarity, and sequences with U are RNA, not a DNA strand.

77. Answer: (A) Presence of anal styles

In cockroach a pair of short, thread-like anal styles is present only in males, so it is a sexually dimorphic feature. Anal cerci and sclerites occur in both sexes, and body colour does not differ between them.

78. Answer: (A) B and C only

The sarcoplasmic reticulum stores calcium ions, and the striated appearance comes from the distribution pattern of actin and myosin. Muscle bundles (fascicles) are held together by a collagenous layer called fascia, not fascicle, and the sarcomere is the part between two Z lines, not the M line.

79. Answer: (A) hairs, pinna and mammary glands

Hair on the skin, external ears (pinnae) and milk-producing mammary glands are the characteristics unique to mammals. A tympanic membrane is also found in frogs, reptiles and birds, mammals have a dicondylic skull, and their development is direct.

80. Answer: (D) Limbic system and hypothalamus

The limbic system (amygdala, hippocampus and related parts) together with the hypothalamus regulates sexual behaviour and the expression of emotional reactions such as excitement, pleasure, rage and fear. Corpora quadrigemina and the corpus callosum have other functions.

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

ADH promotes water reabsorption and prevents diuresis, ANF causes vasodilation, and ADH's constrictory effect on blood vessels raises blood pressure. An excessive loss of body fluid activates, not switches off, the osmoreceptors, and the rise in blood pressure from ADH increases rather than decreases GFR.

82. Answer: (B) C and D only

Thyroid hormones regulate basal metabolic rate, support RBC formation and help maintain water and electrolyte balance. The sleep-wake rhythm is regulated by melatonin from the pineal gland, and development of the immune system is supported by thymosins from the thymus, so these are not under thyroid control.

83. Answer: (C) Active Transport

Moving ions against their concentration gradient needs energy from ATP and carrier proteins (pumps), which is active transport. Facilitated diffusion, passive transport and osmosis all move substances only down a gradient.

84. Answer: (C) China rose, Petunia and Lemon

In axile placentation the placenta is axial and ovules are attached to it in a multilocular ovary, as in China rose, tomato, lemon and Petunia (Solanaceae). Beans and lupin have marginal placentation, Dianthus has free central placentation, and mustard has parietal placentation.

85. Answer: (D) Dobson units

The thickness of ozone in a column of air from the ground to the top of the atmosphere is measured in Dobson units (DU). Decibels measure sound intensity and kilobase measures DNA length.

86. Answer: (D) Manganese

Manganese activates the enzymes of photolysis and is needed for splitting water to release oxygen during photosynthesis. Magnesium is in chlorophyll, molybdenum is in nitrogenase and nitrate reductase, and copper is in plastocyanin, but none of them splits water.

87. Answer: (D) Both Statement I and Statement II are correct

Transpiration pull can create enough force to lift a xylem-sized column of water over 130 metres. Transpiration also cools leaf surfaces, sometimes by 10 to 15 degrees, through evaporative cooling, so both statements are correct.

88. Answer: (A) A and D only

Lenticels are lens-shaped openings in the bark that allow exchange of gases, and bark refers to the periderm plus the secondary phloem, so these two are correct. Bark formed early in the season is soft (early) bark, bark is a non-technical term rather than a technical one, and phellogen is a couple of layers thick, not single-layered.

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

Cohesion is the mutual attraction among water molecules, adhesion is attraction to polar surfaces, surface tension comes from water molecules attracting each other more in the liquid phase than in the gas phase, and guttation is water loss in liquid form. The trap is to swap cohesion and adhesion.

90. Answer: (A) Algal blooms caused by excess of organic matter in water improve water quality and promote fisheries

Algal blooms from excess nutrients spoil water quality and kill fish, so saying they improve water quality and promote fisheries is not correct. Water hyacinth thriving in eutrophic water, biomagnification of toxic substances and oxygen depletion by microbes decomposing sewage are all correct statements.

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

Iron activates catalase, zinc is needed for the synthesis of auxin, boron is required for cell elongation and differentiation, and molybdenum is a component of nitrate reductase. The trap is to give iron the nitrate reductase role.

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

The fovea is the point of greatest visual acuity, the iris is the visible coloured part that regulates pupil diameter, the blind spot is where the optic nerve leaves the eye and there are no photoreceptors, and the sclera is the outer layer of dense connective tissue. The trap is to swap the fovea and the blind spot.

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

Peptic (chief) cells secrete the proenzyme pepsinogen, goblet cells secrete mucus, oxyntic (parietal) cells secrete HCl and intrinsic factor needed to absorb vitamin B_{12}, and hepatic cells secrete bile. The trap is to give peptic cells the HCl.

94. Answer: (A) Biomagnification refers to increase in concentration of the toxicant at successive trophic levels.

Biomagnification is the increase in concentration of a toxicant at successive trophic levels. A large amount of nutrients promotes rather than restricts algal blooms, blooms increase fish mortality, and eutrophication is the natural ageing and nutrient enrichment of a lake, not merely an increase in sewage.

95. Answer: (A) Ileo-caecal valve

The ileo-caecal valve at the junction of the ileum and caecum prevents backflow of the undigested material into the ileum. The gastro-oesophageal sphincter and pyloric sphincter guard the stomach, and the sphincter of Oddi guards the common hepato-pancreatic duct.

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

CCK acts on the pancreas and gall bladder, GIP inhibits gastric secretion and motility, ANF is secreted by the heart, and ADH acts on the kidney. The trap is to pair GIP with the heart.

97. Answer: (B) Statement I is correct but Statement II is incorrect.

The electrostatic precipitator is the most widely used device for removing particulate matter from thermal power plant exhaust, so the first statement is correct. It removes particulate matter, not ionising radiation, so the second statement is incorrect.

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.