

LIFE SCIENCE

PAPER - II

Note : This paper contains **hundred (100)** objective type questions, each question carrying **two (02)** marks. **All** the questions are compulsory.

1. DNA fingerprinting uses a specific type of DNA sequence, known as :
- (A) Palindromic sequence
 - (B) Microsatellite DNA
 - (C) Chimeric DNA
 - (D) CDNA.
2. Which of the following statements regarding enzyme inhibition is correct ?
- (A) Non-competitive inhibition of an enzyme can be overcome by adding large amount of substrate
 - (B) Competitive inhibition is seen when the substrate and the inhibitor compete for the active site on the enzyme
 - (C) Non-competitive inhibitors often bind to the enzyme irreversibly
 - (D) Competitive inhibition is seen when a substrate competes with an enzyme for binding to as inhibitor protein
3. Which of the following is correct in DNA ?
- (A) A forms 2 hydrogen bonds with G; T forms 3 hydrogen bonds with C
 - (B) A forms 3 hydrogen bonds with T; G forms 2 hydrogen bonds with C
 - (C) A forms 2 covalent bonds with T; G forms 3 covalent bonds with C
 - (D) A forms 2 hydrogen bonds with T; G forms 3 hydrogen bonds with C
4. When cancer cells gain the ability to move independently and invade other tissues, they are said to have :
- (A) Evolved
 - (B) Metamorphosed
 - (C) Metastasized
 - (D) Mobilized

5. Which of the following species are occasionally referred to as 'opportunistic':
 (A) Allopatric species
 (B) Sympatric species
 (C) r-selected species
 (D) K-selected species
6. The hormones secreted by the hypothalamus in the region of median eminence are carried to adenohypophysis by which one of the following?
 (A) Hypophyseal stalk
 (B) Hypophyseal portal system
 (C) Pituitary stalk
 (D) Neurohypophysis
7. The major type of bond between antigen and antibody is
 (A) Hydrogen bond
 (B) Covalent bond
 (C) Hydrophobic interactions
 (D) van der Waals force.
8. The molecular weight of a protein molecule is 14.4 kDa, what would be the minimum number of nucleotides in the mRNA from where this protein is synthesised? Assume that the molecular weight of each amino acid of the protein is 80 Da
 (A) 60
 (B) 180
 (C) 240
 (D) 540
9. Which one of the following is considered the best for understanding general relationships of plants?
 (A) Cytotaxonomy
 (B) Experimental Taxonomy
 (C) Numerical Taxonomy
 (D) Chemotaxonomy
10. Discovery of new species has recently picked up due to initiatives under the projects:
 (a) Species 2000
 (b) Global diversity and information facility
 (c) Agenda 21
 (d) Climate change.
 (A) (a) and (b)
 (B) (b) and (c)
 (C) (a), (b), and (c)
 (D) All of the above
11. The chromosomal pattern of Klinefelter's syndrome is
 (A) XXX
 (B) XXY
 (C) XO
 (D) XYY
12. The major amino acids in histone are
 (A) Arginine, Lysine and Histidine
 (B) Glutamate and Aspartic acid
 (C) Lysine and Arginine
 (D) Histidine

13. In which type of cells of human mitochondria are absent?

- (A) Liver Cells
- (B) Brain Cells
- (C) Erythrocytes
- (D) Osteoblasts

14. Ecocline is

- (A) transient region between two adjacent communities
- (B) transient region between two adjacent species
- (C) transient region between two adjacent ecotypes
- (D) transient region between two adjacent forest

15. Okazaki fragments are:

- (A) Primed by RNA primer
- (B) Formed in the 5'-3' direction
- (C) United to form lagging strand
- (D) All of the above

16. You are given 17 meiotic cell divisions. With these divisions how many seeds are possible? How many pollen grains will be wasted?

- (A) 17 seeds and 3 pollen grains
- (B) 17 seeds and 17 pollen grains
- (C) 13 seeds and 3 pollen grains
- (D) None of these

17. Match the items of Column-I with those of Column-II and select the correct match using codes:

Column-I
(Gene)

(a) *wee 1*

(b) *suc 1*

(c) *nim 1*

(d) *cdc 25*

Column-II
(Function)

1. Dephosphorylation of Cdk 1

2. Phosphorylation of Cdk

3. Negative control of *wee 1*

4. Converts M form of Cdk-1 to S form

Codes :

	(a)	(b)	(c)	(d)
(A)	2	1	4	3
(B)	3	1	4	2
(C)	2	4	3	1
(D)	4	3	2	1

18. Match the items of Column-I with those of Column-II and select the correct match using codes:

Column-I

(a) HPM shunt

(b) Russell bodies

(c) Cytochromes

(d) Glucagon

Column-II

1. Inner mitochondrial membrane

2. Initiates respiratory burst in phagocytic neutrophils

3. Stimulates liver glucose-6-phosphatase

4. Plasma cells

Codes :

	(a)	(b)	(c)	(d)
(A)	2	1	3	4
(B)	3	4	2	1
(C)	2	4	1	3
(D)	4	2	3	1

19.

C

(a)

(b)

19. Match the items of Column-I with those of Column-II and select the correct match using codes :

Column-I	Column-II
(a) white blood cells	1. Thymus gland
(b) body cells in which viruses are reproducing are defended by	2. Macrophages
(c) anaphylaxis	3. Cytotoxic T cells
(d) maturation of T cells	4. Bee sting

Codes :

	(a)	(b)	(c)	(d)
(A)	1	2	4	3
(B)	3	4	1	2
(C)	4	1	3	2
(D) ✓	2	3	4	1

20. Match the items of Column-I with those of Column-II and select the correct match using codes :

Column-I	Column-II
(a) epigenetic	1. participates in active transcription of DNA to mRNA
(b) euchromatin	2. when molecule relieves helical stress by twisting around itself
(c) supercoiling	3. severe reduction in population size
(d) bottleneck	4. signal for formation of a regional centromere appears to be

Codes :

	(a)	(b)	(c)	(d)
(A)	2	1	4	3 X
(B) ✓	4	1	2	3
(C)	3	2	1	4 X
(D)	1	4	3	2 X

21. Match the items in Column-I with those of Column-II and select correct match by using the codes given below :

Column-I	Column-II
(a) Homopolymer of phenylalanine	1. Peptide bond formation
(b) Peptidyl transferase	2. Removal of tRNAs from their precursor molecules
(c) Aminoacyl tRNA synthetase	3. Polymerase II
(d) Ribonuclease-P	4. Amino acid activation

Codes :

	(a)	(b)	(c)	(d)
(A)	2	3	1	4 X
(B)	3	1	4	2 X
(C) ✓	3	2	4	1
(D)	3	4	2	1

22. Match the items of Column-I with those of Column-II and select the correct match using codes :

Column-I	Column-II
(a) Acid hydrolases	1. Ribosomes
(b) Protein factory	2. Lipid storage
(c) Elaioplasts	3. Lysosomes
(d) Photorespiration	4. Peroxisomes

Codes :

	(a)	(b)	(c)	(d)
(A)	3	2	1	4 X
(B)	4	1	3	2
(C) ✓	3	1	2	4
(D)	2	4	3	1

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23. Match the items of Column-I with those of Column-II and select the correct match using codes :

Column-I	Column-II
(a) RNA polymerase	1. Protein chain elongation
(b) Peptidyl Transferase	2. Transcription
(c) β -galactosidase	3. Unwind DNA duplex
(d) Helicase	4. Hydrolysis of lactose

Codes :

	(a)	(b)	(c)	(d)
(A)	2	1	4	3
(B)	4	2	3	1
(C)	3	1	2	4
(D)	1	4	3	2

24. Match the items of Column-I with those of Column-II and select the correct match using codes :

Column-I	Column-II
(a) Pachytene	1. Pairing of homologous chromosomes
(b) Metaphase-I	2. Termination of chiasmata
(c) Diakinesis	3. Crossing over takes place
(d) Zygotene	4. Chromosomes align at equatorial plate

Codes :

	(a)	(b)	(c)	(d)
(A)	2	4	3	1 X
(B)	4	3	2	1 X
(C)	3	4	2	1
(D)	1	4	2	3

25. Two statements are given below, one is Assertion (Ass) and the other is Reason (R). Select the correct answer from the codes given below :

Assertion (Ass) : Reserve pool of nutrient cycle becomes emptied and filled repeatedly.

Reason (R) : Nutrient cycles are interdependent and interconnected on one another to a great extent.

Codes :

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

26. Two statements are given below, one is Assertion (Ass) and the other is Reason (R). Select the correct answer from the codes given below :

Assertion (Ass) : Bile is not a true digestive juice.

Reason (R) : Bile lacks digestive enzymes.

Codes :

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

27. Two statements are given below, one is Assertion (Ass) and the other is Reason (R). Select the correct answer from the codes given below :

Assertion (Ass) : Thymus is a lymphoid organ responsible for development of immunity.

Reason (R) : After their origin in bonemarrow some of the lymphocytes are processed in thymus to become T-lymphocytes.

Codes :

- (A) Both (Ass) and (R) are true and (R) is the correct explanation of (Ass)
(B) Both (Ass) and (R) are true but (R) is not the correct explanation of (Ass)
(C) (Ass) is true while (R) is false
(D) Both (Ass) and (R) are false
28. Two statements are given below, one is Assertion (Ass) and the other is Reason (R). Select the correct answer from the codes given below :

Assertion (Ass) : $Tt \times Tt$ is an example of Test cross.

Reason (R) : Test cross progeny are always in the ratio of 1:3:1.

Codes :

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

29. Two statements are given below, one is Assertion (Ass) and the other is Reason (R). Select the correct answer from the codes given below :

Assertion (Ass) : In bacteria DNA Polymerase I is a template-directed enzyme.

Reason (R) : It recognizes the next nucleotide on the DNA template and then adds a complementary nucleotide to the 3'OH of the primer.

Codes :

- (A) Both (Ass) and (R) are true but (R) is not the correct evidence for (Ass)
(B) Both (Ass) and (R) are true but (R) is not the correct explanation
(C) (Ass) is true while (R) is false
(D) Both (Ass) and (R) are false

30. Two statements are given below, one is Assertion (Ass) and the other is Reason (R). Select the correct answer from the codes given below :

Assertion (Ass) : Glycolysis occurs inside the mitochondria due to requirement of ATP.

Reason (R) : The total ATP production in Electron transport chain is 32.

Codes :

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

31. Two statements are given below, one is Assertion (Ass) and the other is Reason (R). Select the correct answer from the codes given below :

Assertion (Ass) : The endomembrane system includes endoplasmic reticulum, Golgi complex, lysosomes and vacuoles.

Reason (R) : Mitochondria, chloroplast and peroxisomes are not the part of endomembrane system because their functions are not coordinated with the same.

Codes :

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

32. Two statements are given below, one is Assertion (Ass) and the other is Reason (R). Select the correct answer from the codes given below :

Assertion (Ass) : Viruses are not included in any system of classification.

Reason (R) : Viruses are nonliving but develop living characters like multiplication etc. when they come in contact with suitable host.

Codes :

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

33. Select the correct answer for the following statements using codes :

- (i) Coacervate in the primitive earth were self-duplicating aggregates of proteins surrounded by lipid molecules
 (ii) First living organisms were heterotrophs
 (iii) Reproductive isolation does not let evolution to occur
 (iv) Reproductive isolation brings about sympatric speciation

Codes : (i) (ii) (iii) (iv)

- (A) False True False False
 (B) False True True False
 (C) False False False True
 (D) False True False True

34. Select the correct answer from the following statements using codes :

- (i) Plasmodesmata connect actin fibres of one cell to the extracellular matrix of another
 (ii) An individual with two normal sets of autosomes and a single X-chromosome has Turner's syndrome
 (iii) Zinc is a co-factor for the proteolytic enzyme carboxypeptidase
 (iv) Mutations resulting in addition or deletion of a base within a gene are frameshift mutation

Codes : (i) (ii) (iii) (iv)

- (A) False True True True
 (B) True True True False
 (C) True False False True
 (D) False True False True

35. Select the correct answer for the following statements using codes :

- (i) Conscious effort is a postulate of Darwinism
- (ii) De Vries has contributed to the modern synthetic theory of evolution
- (iii) "Ontogeny repeats phylogeny"— Statement is given by Lamarck
- (iv) Natural allopolyploidy has helped in the evolution of new species

Codes : (i) (ii) (iii) (iv)
 (A) False False True False
 (B) True True False True
 (C) False True False True
 (D) False True True False

36. Select the correct answer for the following statements using codes :

- (i) Auxin is the hormone in metabolism of food material in cereal grains during germination
- (ii) 'Genetic dwarfism' in plant can be overcome by Gibberellin.
- (iii) 'Triple response' is an important bioassay of ethylene
- (iv) Gibberellic acid is not related to etiolation phenomenon

Codes : (i) (ii) (iii) (iv)
 (A) True False True True
 (B) False True False True
 (C) True False True False
 (D) False True True False

37. Examine the following statements and select the correct answer from the codes given below :

- (a) The population reaching to carrying capacity will have the mortality rate $>$ birth rate
- (b) The population reaching to carrying capacity will have mortality rate $<$ birth rate
- (c) Environmental resistance is inversely related to the difference between carrying capacity and existing population
- (d) Population growth becomes zero when it reaches the carrying capacity.

Codes : (a) (b) (c) (d)
 (A) False True False True
 (B) True False True False
 (C) False True True False
 (D) True False False False

38. Select the correct answer for the following statements using codes :

- (i) Pancreas is an endocrine gland
- (ii) Islets of Langerhans are not encapsulated but remain separated by reticular fibres
- (iii) γ -cells are regarded as the precursors of α and β -cells of pancreas
- (iv) α -cells of pancreas secrete insulin

Codes : (i) (ii) (iii) (iv)
 (A) False True True False
 (B) False False True True
 (C) True False True False
 (D) True True False False

P.T.O.

39. Select the correct answer from the following statements using codes :

- (i) Linkage mapping can offer firm evidence that a disease transmitted from parent to child is linked to one or more genes.
- (ii) DNA markers don't by themselves identify the gene responsible for a trait.
- (iii) Markers are usually consist of DNA that contain a gene
- (iv) Genetic markers are valuable for tracking inheritance of traits through generations of a family.

Codes : (i) (ii) (iii) (iv)

- (A) True True False False
- (B) True True False True
- (C) True False False True
- (D) False False True False

40. Select the correct statement/ statements for population growth and choose the correct answer using codes :

- (i) The carrying capacity for a given population is represented by an equation

$$\frac{dN}{dt} = rN - \frac{N}{K}$$

- (ii) The logistic population growth is expressed by $dN / dt = rN$

- (iii) In a natural population at carrying capacity the equation representing the population growth will be

$$\frac{dN}{dt} = rN \left(1 - \frac{N}{K} \right)$$

- (iv) The equation for logistic growth of population of organism is —

$$\frac{dN}{dt} = rN \left(\frac{K - N}{K} \right)$$

Codes : (i) (ii) (iii) (iv)

- (A) False True False True
- (B) True True False False
- (C) False False True True
- (D) True True False True

41. The hormone related with adaptation to stress is :
- (A) Calcitonin
 - (B) Cortisol
 - (C) Aldosterone
 - ✓ (D) Adrenocortical hormone
42. Heparin presents normally in blood is formed by —
- (A) Granulocytes
 - (B) Clumped platelets
 - ✓ (C) Mast Cell
 - (D) Monocytes
43. The ovum together with its surrounding granulosa cells is called —
- ✓ (A) Graafian follicle
 - (B) Cumulus oophorus
 - (C) Corona radiata
 - (D) Corpus albicans
44. Which one of the following technique is particularly useful for studying gene expression ?
- (A) Inverted - PCR
 - ✓ (B) RT-PCR
 - (C) AFLP-PCR
 - (D) Nested - PCR
45. In *E. coli*, according to the operon theory, an operator gene combines with —
- (A) Regulator protein to switch on structural gene transcription
 - ✓ (B) Regulatory protein to switch off structural gene transcription
 - (C) Inducer gene to switch on structural gene transcription
 - (D) Regulator gene to switch on structural gene transcription.
46. Mammals are totally independent of water at the time of reproduction unlike lower chordates. The reproductive specialization permitting this is :
- ✓ (A) Internal fertilization
 - (B) Yolk storage
 - (C) Mammary glands
 - (D) Development of placenta

47. The ray florets in Asteraceae family are characterized by the presence of —

- (A) Unisexual, female or neuter, zygomorphic epigynous flowers whose sepals are modified into pappus
- (B) Unisexual female or neuter, actinomorphic, hypogynous flowers without modified sepals
- (C) Bisexual, zygomorphic hypogynous flowers with sepals modified into pappus
- (D) Bisexual, actinomorphic, epigynous flowers with modified sepals into pappus

48. Which one of the following is the correct sequence of flow of electrons in the photochemical reaction of photosynthesis?

- (A) PS-II, plastoquinone, cytochromes, PS-I and ferredoxin
- (B) PS-I, plastoquinone, cytochromes, PS-II and ferredoxin
- (C) PS-I, ferredoxin and PS-II
- (D) PS-I, plastoquinone, cytochromes, PS-II and ferredoxin

49. Which of the following algae is the copper container?

- (A) *Batrachospermum*
- (B) *Sarconema furcellatum*
- (C) *Acanthophora spicifera*
- (D) Both B and C

50. In eukaryotes 5' capping in mRNA is required for:

- (A) Initiation of transcription
- (B) Initiation of translation
- (C) Removal of introns
- (D) Termination of transcription

51. The end point of succession can be determined by:

- (A) abiotic causes
- (B) biotic causes
- (C) edaphic causes
- (D) climatic causes

52. Due to an accidental seepage one land locked lake of North East India is contaminated with some toxic compounds. Which of the following organisms are assumed to be most affected?

- (A) Phytoplankton
- (B) Zooplankton
- (C) Fish
- (D) Water birds

53. All of the following are sources of genetic variation for evolution, except:

(A) mutation ✓

(B) recombination ✓

(C) genetic drift ✓

(D) gene flow

54. _____ states that when two species hybridize, the sex that is most often inviable or sterile is the heterogametic sex (sex with different sex chromosomes).

(A) Haldane's Rule

(B) Natural selection

(C) Bateman's Rule ✓

(D) None of the above

55. If mammalian ovum fails to get fertilised, which of the following events is likely to occur?

(A) Estrogen secretion further decreases

(B) Progesterone secretion rapidly declines ✓

(C) Corpus luteum will disintegrate

(D) Primary follicle starts developing

56. The cell which plays a major role in host defence against tumor cells and the cells infected with viruses are:

(A) B-lymphocyte

(B) Interferons ✓

(C) NK cells

(D) Neutrophils

57. The ion mainly absorbed in the distal convoluted part of nephron is

(A) Na^+ ✓

(B) K^+

(C) Mg^{++}

(D) Ca^{++}

58. Foetal membrane that participates in the formation of placenta in human female is

(A) Allantois

(B) Amnion

(C) Yolk-sac

(D) Chorion ✓

59. Respiration is a

(A) Catabolic process that uses CO_2 , produces O_2 and converts the released energy into ATP ✗

(B) Anabolic process that uses O_2 and CO_2 to form ATP ✗

(C) Anabolic process that uses O_2 , produces CO_2 and converts the released energy into ATP ✗

(D) Catabolic process that uses O_2 , produces CO_2 and converts the released energy into ATP ✓

60. Select the correct answer from the following statements using codes :

- Neurotransmitters are produced and released by nerve and muscle cells.
- After their release, neurotransmitters act on a target area and produce biological effects.
- Acetylcholine is a neurotransmitter at neuromuscular junction.
- Serotonin is a neurotransmitter with excitatory function.

Codes : a b c d

(A) True True False False
 (B) False True True False ✗
 (C) True False True False
 (D) False False True True

61. Select the correct answer from the following statements using codes :

- Three unliked families of genes are responsible for immunoglobulin molecule structure.
- One family of gene is responsible for the chains λ and κ .
- The heavy chain of immunoglobulin molecule is encoded by four gene segments.
- Antigen specific immunoglobulin molecules are generated by rearrangement of the various VL, JL and CL segments in the genome.

Codes : a b c d

(A) False False True True
 (B) True False True True
 (C) True True False False
 (D) False True True False

62. Select the correct answer from the following statements using codes :

- Cis-trans isomerism occurs in compounds with double bonds.
- The amino sugars are formed by the replacement of hydroxyl group attached to carbon atom 3 of the sugar by an amino group.
- Mannosamine is an important constituent of mucoprotein.
- Cyclic AMP depresses phosphorylase activity.

Codes : a b c d

(A) True True False False
 (B) False False True True
 (C) False True False False
 (D) True False True False

63. Following statements are either True or False. Select them from the codes given below :

- In haemoglobin, iron is attached with globin protein by hydrogen bonds.
- Fossa ovalis of mammalian heart is the remnant of embryonic sinus venosus.
- The frequent micturition due to decreased vasopressin is called diabetes insipidus.
- In a resting nerve cell potassium concentration is more on the outside of the membrane.

Codes : a b c d

(A) False True True False
 (B) False False True True
 (C) True False True False
 (D) True True False True

64. Following statements are either True or False. Select the correct answer from the codes given below :

- a. The ΔG° of a reaction can be calculated from its K_{eq} .
- b. The rate of reaction depends on the activation energy.
- c. The change in free energy determines the direction of a chemical reaction.
- d. In biological system cells can transform one type of energy into another.

Codes : a b c d

(A) False True True False

(B) True True True True

(C) True False False False

(D) False False False True

65. Examine the following statements and select the correct answer from the codes given below :

- a. Flow of energy in any ecosystem is multi-directional.
- b. Omnivores are generalist feeders.
- c. Heterotrophic organisms literally feed themselves.
- d. Food chain can be used to demonstrate the biological fate at individual atoms.

Codes : a b c d

(A) False False True True

(B) False True False True

(C) True False True False

(D) False True True False

66. Following statements are either True or False. Select them from the codes given below :

- a. Non-coding RNAs regulate RNA splicing, DNA replication and gene regulation.
- b. Gene duplication is the mechanism through which new genetic material is generated during molecular evolution.
- c. Gene amplification usually occurs in mitosis.
- d. Small sub-unit of ribosome binds to 5' end of tRNA.

Codes : a b c d

(A) False True True False

(B) True False True True

(C) False True False False

(D) True True False False

67. Following statements are either True or False. Select them from the codes given below :

- a. Methylation can change the activity of a DNA segment without changing the sequence.
- b. Activator inhibits the interaction between RNA polymerase and a particular promoter.
- c. miRNA response elements (MREs) are sequences to which miRNA cannot bind.
- d. Ribozymes have diverse structures and mechanism to accomplish functions.

Codes : a b c d

(A) True False True False

(B) False True False True

(C) True False False True

(D) False True True False

P.T.O.

68. Select the correct answer from the following statements using codes given below :

- a. An antibody is a molecule that specifically inactivates an antigen. ✓
- b. Major phagocytic cells are lymphocytes.
- c. T-lymphocytes first mature in Thymus.
- d. The cells that actually release the antibodies are plasma cells.

Codes : a b c d

(A) True False False True

(B) False True False True ✓

(C) True False True True ✓

(D) False True True False

69. Examine the following statements and find out the correct answer by using codes given below :

- a. Allopatric species are occupying different geographical areas.
- b. Sibling species are one of two or more species that do not resemble one another and cannot interbreed.
- c. Sympatric species are distantly related species living in one common locality.
- d. Genetic species are the group of organisms that may inherit characters from each other's common gene pool.

Codes : a b c d

(A) True True False True

(B) True False False True

(C) True False True False ✓

(D) True True False False

70. Select the correct answer for the following statements using codes :

- a. Lymphocytes are responsible for acquired immunity.
- b. Lymphocytes that designed to develop the cellular immunity migrate to thymus.
- c. B-lymphocytes were discovered in Bone marrow and hence the name B-lymphocytes.
- d. Helper T-cells destroy foreign organisms by producing antibodies.

Codes : a b c d

(A) False True True False

(B) False False True True

(C) True True False False

(D) True False True False ✓

71. Select the correct answer for the following statements using codes :

- a. Cell wall matrix consist of hemicellulose, pectin, glycoprotein, lipid and water.
- b. Fungus, chitin microfibrils are made of bundle of unbranched chain of α -acetyl glucosamine residue.
- c. Plant cell wall may have lignin for strength and silica for stiffness
- d. Middle lamella of cell wall is made up of Phosphorus and Magnesium pectate.

Codes : a b c d

(A) False True True False ✓

(B) False True False True

(C) True False True False

(D) True True True False

72. Following statements are given to describe operon concept. Find the correct answer from the codes given below:

- Operon is a group of structural genes whose transcription is regulated by action of regulator, promoter, operator and terminator genes.
- A recognition sequence is an element of promoter gene.
- A regulator protein binds to an operator and inhibits expression when inducer is absent.
- In the repressible system repressor protein formed by regulator gene is active.

Codes : a b c d

(A)	True	True	True	False
(B)	False	False	False	True
(C)	True	False	True	False
(D)	False	True	False	True

73. Examine the following statements and select the correct answer from the codes given below:

- The Forest Act was enacted in India in 1925. ~~X~~
- The Biodiversity Act of India was passed by the Indian Parliament in 2000. ~~X~~
- National 'Wildlife Protection Act' was passed in 1972. ✓
- Biosphere Reserve Programme started in India in 1988.

Codes : a b c d

(A)	True	False	True	True
(B)	True	True	True	False
(C)	False	False	True	True
(D)	False	True	True	False

74. Select the correct answer from the following statements using the codes:

- Sustainable development is primarily an issue of investment in developing countries.
- Sustainable development is synonymous with conservation of the environment. ✓
- An objective of sustainable development is ending the use of non-renewable resources.
- The concept of sustainable development first evoked in 1972, during the Earth Summit of Rio de Janeiro. ~~X~~

Codes : a b c d

(A)	True	True	False	False
(B)	False	False	False	True
(C)	True	False	True	True
(D)	False	False	True	False

75. Select the correct answer from the following statements using the codes:

- Building of dams for hydroelectric powers in hilly rivers of North-east region is environmentally sustainable. ✓
- River linking through artificial water channels might prove to be disastrous for aquatic biodiversity. T
- Concrete embankment of aquatic bodies are beneficial for the amphibian species as it might provide them with greater basking surface. T
- Rapid change in the environment may result in extinction because organisms may not have time to adapt. T

Codes : a b c d

(A)	True	True	False	False
(B)	True	False	False	True
(C)	False	False	True	True
(D)	False	True	False	True

P.T.O.

76. Match the items Column-I with those of Column-II and select the correct match using codes :

Column-I	Column-II
a. Charles Darwin	1. Molecular biology
b. Konrad Lorenz	2. Genetics
c. Gregor Mendel	3. Ethology
d. James Watson	4. Evolution

Codes :

(A)	a	b	c	d
(B)	1	3	2	4
(C)	3	4	2	1
(D)	4	3	2	1
	2	3	1	4

77. Match the items of Column-I with those of Column-II and select the correct match from the codes given below :

Column-I	Column-II
a. Circumboreal	1. Distributed throughout the tropical areas
b. Circumpolar	2. Distributed throughout the south temperate areas
c. Circumastral	3. Distributed throughout the north temperate areas
d. Pantropical	4. North polar areas only

Codes :

(A)	a	b	c	d
(B)	3	4	1	2
(C)	2	4	1	3
(D)	3	4	2	1
	4	3	1	2

78. Match the items of Column-I with those Column-II and select the correct match using the codes given below :

Column-I	Column-II
a. Operator gene	1. Provides a site for binding of activator proteins and RNA polymerase.
b. Promoter gene	2. Makes enzymes that control metabolism such as lactose in the cell
c. Regulator gene	3. Switches on cistron activity
d. Structural gene	4. Synthesizes a molecule that blocks a gene adjacent to structural gene

Codes :

(A)	a	b	c	d
(B)	2	1	3	4
(C)	3	1	4	2
(D)	2	3	4	1
	3	4	1	2

79. Match the items of Column-I with those of Column-II and select the correct match using codes :

Column-I	Column-II
a. Tyrosine	1. Protein produced by virus infected cells
b. Interferon	2. Cell wall
c. Transposons	3. Synthesis of adrenaline and nor-adrenaline
d. O-antigen	4. Jumping gene

Codes :

(A)	a	b	c	d
(B)	2	1	3	4
(C)	4	2	1	3
(D)	3	4	2	1
	3	1	4	2

80. Match the items of Column-I with those of Column-II and select the correct match from the codes given below :

Column-I	Column-II
a. Restriction endonuclease	1. Kary Mullis
b. DNA Finger printing	2. Kohler and Milstein
c. Polymerase chain reaction	3. Alec Jaffreys
d. Monoclonal antibodies	4. Werner Arber

Codes :

(A)	a	b	c	d
(B)	4	3	1	2
(C)	4	3	2	1
(D)	2	1	4	3
	3	2	1	4

81. Match the items in Column-I with those in Column-II and select the correct match by using codes:

Column-I	Column-II
a. Growth hormone producing apical dominance is	1. Somaclonal
b. Variation occurs in growing cells during tissue culture of plant is	2. Subculturing
c. The product of viable protoplast fusion is	3. Auxin
d. Separation of multiple microshoots and placing them in a medium is known as	4. Somatic hybrid

Codes :	a	b	c	d
(A)	2	3	1	4
(B)	3	1	4	2
(C)	4	2	1	3
(D)	2	4	3	1

82. Match the items of Column-I with those of Column-II and select the correct match by using the codes given below:

Column-I	Column-II
a. Cell suspension culture	1. Sodium alginate
b. Synthetic seeds	2. Polyethylene glycol
c. Fusogen	3. Dimethyl sulfoxide
d. Cryoprotectant	4. Secondary metabolites

Codes :	a	b	c	d
(A)	2	3	1	4
(B)	4	1	2	3
(C)	3	4	1	2
(D)	1	2	4	3

83. Match the items of Column-I with those of Column-II and select the correct match from the codes given below:

Column-I	Column-II
a. Homeorhesis	1. Ability to way back home
b. Homeostasis	2. Tendency of a system to maintain itself in state of stable equilibrium
c. Homeotherm	3. Tendency of a system to maintain itself in a pulsing state of equilibrium
d. Homing	4. Ability to maintain a relatively constant body temperature

Codes :	a	b	c	d
(A)	3	2	4	1
(B)	3	2	1	4
(C)	2	3	4	1
(D)	2	3	1	4

84. Match the items of Column-I with those of Column-II and select the correct match from the codes given below:

Column-I	Column-II
a. World Forestry Day	1. 4th October
b. World Wetland Day	2. 29th December
c. World Habitat Day	3. 21st March
d. Biological Diversity Day	4. 2nd February

Codes :	a	b	c	d
(A)	4	3	1	2
(B)	3	4	1	2
(C)	4	3	2	1
(D)	2	3	1	4

P.T.O.

85. Match the items of Column-I with those of Column-II and select the correct match using codes :

Column-I	Column-II
a. UDP Glucose 1. pyrophosphorylase	1. Glycogenesis
b. Glycogen phosphorylase	2. Glycolysis
c. Pyruvate carboxylase	3. Gluconeogenesis
d. Phosphohexoisomerase	4. Glycogenolysis

Codes :

	a	b	c	d
(A)	1	4	3	2
(B)	2	3	1	4
(C)	3	1	2	4
(D)	4	2	3	1

86. Match the items in Column-I with those of Column-II and select the correct match by using codes given below :

Column-I	Column-II
a. Glycolysis	1. Inner membrane of Mitochondria
b. ETS	2. Step-wise oxidation
c. Respiration	3. Alcoholic fermentation
d. Yeast	4. ATP

Codes :

	a	b	c	d
(A)	2	3	4	1x
(B)	1	2	3	4
(C)	4	1	2	3x
(D)	3	4	1	2x

87. Match the items of Column-I with those of Column-II and select the correct match using codes :

Column-I	Column-II
a. Hammerhead shark	1. Chondrichthyes
b. Pangolin	2. Neornithes
c. Emu	3. Eutheria
d. Mudpuppy	4. Urodela

Codes :

	a	b	c	d
(A)	1	3	2	4
(B)	1	3	4	2
(C)	3	2	4	1
(D)	3	1	2	4

88. Match the items of Column-I with those of Column-II and select the correct match using codes :

Column-I	Column-II
a. Amnion	1. Mammalian ovum
b. Primitive streak	2. Amphibian gastrula
c. Dorsal lip of blastopore	3. Chick's gastrula
d. Zona radiata	4. Reptilian embryo

Codes :

	a	b	c	d
(A)	4	3	2	1
(B)	4	2	3	1
(C)	3	4	1	2
(D)	2	1	3	4

89. Below are two statements — One is Assertion (Ass) and the other Reason (R). Find out the correct answer using the codes given below :

Assertion (Ass) : Interferons help to eliminate viral infections.

Reason (R) : Interferons released by infected cells, reach the nearby uninfected cells and make them resistant to viral infection.

Codes :

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

90. Two statements are given below. One is Assertion (Ass) and the other is Reason (R). Select your correct answer from the codes given below :

Assertion (Ass) : The study of classification of organisms is called taxonomy.

Reason (R) : Taxonomy and systematics are synonymous.

Codes :

- (A) Both (Ass) and (R) are true, and (R) is the correct explanation of (Ass)
- (B) Both (Ass) and (R) are true, but (R) is not the correct explanation of (Ass)
- (C) (Ass) is true but (R) is false
- (D) Both (Ass) and (R) are false

91. Two statements are given below. One is Assertion (Ass) and the other is Reason (R). Select your correct answer from the codes given below :

Assertion (Ass) : DDT shows bioaccumulation in food chain.

Reason (R) : DDT is non-biodegradable and cannot be metabolized in the organisms body.

Codes :

- (A) Both (Ass) and (R) are true, and (R) is the correct explanation of (Ass)
- (B) Both (Ass) and (R) are true, but (R) is not the correct explanation of (Ass)
- (C) (Ass) is true, but (R) is false
- (D) Both (Ass) and (R) are false

92. Two statements are given below. One is Assertion (Ass) and other is Reason (R). Select the correct answer from the codes given below :

Assertion (Ass) : α -ketoglutarate plays a pivotal role in amino acid metabolism by accepting the NH_2 groups from most of the amino acids.

Reason (R) : The aminotransaminases are found in nucleus of cells throughout the body.

Codes :

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

93. Two statements are given below, one is Assertion (Ass) and the other is reason (R). Select the correct answer from the codes below :

Assertion (Ass) : Eutrophic lakes harbour excessive growth of phytoplankton.

Reason (R) : Eutrophic lakes contain low oxygen content.

Codes :

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

P.T.O.

94. Two statements are given below. One is Assertion (Ass) and the other is Reason (R). Find the correct answer using the codes given below :

(Ass) : During Southern Blotting, the DNA gel is placed into an alkaline solution to denature the double stranded DNA.

(R) : The denaturation in an alkaline environment may improve binding of the positively charged thymine residues of DNA to a negatively charged amino groups of the membrane.

Codes :

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

95. Two statements are given below, one is Assertion (Ass) and the other is Reason (R). Select the correct answer using the codes given below :

Assertion (Ass) : Protein-protein interactions (PPI) are physical contacts of high specificity established between two or more protein molecules.

Reason (R) : The recruitment of signaling pathways through PPI is called signal transduction and plays a fundamental role in biological processes.

Codes :

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

96. Two statements are given below, one is Assertion (Ass) and the other is Reason (R). Select the correct answer from the codes given below :

Assertion (Ass) : In dideoxy procedure of DNA sequencing, DNAs are labelled by using nick translation.

Reason (R) : Automated DNA sequencing is the technical modification of Restriction fragment length polymorphism.

Codes :

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

97. Two statements are given below, one is Assertion (Ass) and the other is Reason (R). Select the correct answer from the codes given below :

Assertion (Ass) : IgG is the most abundant class of immunoglobulins in the body.

Reason (R) : IgG is mainly found in sweat, tears, saliva, mucus and gastrointestinal secretions.

Codes :

- (A) Both (Ass) and (R) are correct, and (R) is the correct explanation of (Ass)
(B) Both (Ass) and (R) are true, but (R) is not the correct explanation of (Ass)
(C) (Ass) is true but (R) is false
(D) Both (Ass) and (R) are false

98. Two statements are given, one is Assertion (Ass) and the other is Reason (R). Select the correct answer from the codes given below :

Assertion (Ass) : Replication and transcription occur in the nucleus but translation takes place in the cytoplasm.

Reason (R) : mRNA is transferred from the nucleus into cytoplasm where ribosomes and amino acids are available for protein synthesis.

Codes :

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

99. Two statements are given below, one is Assertion (Ass) and the other is Reason (R). Select the correct answer from the codes given below :

Assertion (Ass) : Imbalance in Na^+ and K^+ and proteins generate the resting potential.

Reason (R) : To maintain unequal distribution of Na^+ and K^+ , neurons use electrical energy.

Codes :

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

100. Two statements are given below, one is Assertion (Ass) and the other is Reason (R). Select the correct answer from the codes given below :

Assertion (Ass) : The earliest enzymes are thought to be ribozymes.

Reason (R) : The enzymes are non-specific catalytic RNA.

Codes :

- (A) Both (Ass) and (R) are true and (R) is the correct explanation of (Ass)
- (B) Both (Ass) and (R) are true, but (R) is not the correct explanation of (Ass)
- (C) (Ass) is true but (R) is false
- (D) Both (Ass) and (R) are false