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) Progesteron 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) Po^{4--}

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 :

a. Neurotransmitters are produced and released by nerve and muscle cells.

b. After their release, neurotransmitters act on a target area and produce biological effects.

c. Acetylcholine is a neurotransmitter at neuromuscular junction.

d. 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 :

a. Three unliked families of genes are responsible for immunoglobulin molecule structure.

b. One family of gene is responsible for the chains λ and κ.

c. The heavy chain of immunoglobulin molecule is encoded by four gene segments.

d. 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 :

a. Cis-trans isomerism occurs in compounds with double bonds.

b. The amino sugars are formed by the replacement of hydroxyl group attached to carbon atom 3 of the sugar by an amino group.

c. Mannosamine is an important constituent of mucoprotein.

d. 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 :

a. In haemoglobin, iron is attached with globin protein by hydrogen bonds.

b. Fossa ovalis of mammalian heart is the remnant of embryonic sinus venosus.

c. The frequent micturition due to decreased vasopressin is called diabetes insipidus.

d. 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 :

a. Operon is a group of structural genes whose transcription is regulated by action of regulator, promoter, operator and terminator genes.

b. A recognition sequence is an element of promoter gene.

c. A regulator protein binds to an operator and inhibits expression when inducer is absent.

d. 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 :

a. The Forest Act was enacted in India in 1925.

b. The Biodiversity Act of India was passed by the Indian Parliament in 2000.

c. National 'Wildlife Protection Act' was passed in 1972.

d. 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 :

a. Sustainable development is primarily an issue of investment in developing countries.

b. Sustainable development is synonymous with conservation of the environment.

c. An objective of sustainable development is ending the use of non-renewable resources.

d. The concept of sustainable development first evoked in 1972, during the Earth Summit of Rio de Janeiro.

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 :

a. Building of dams for hydroelectric powers in hilly rivers of North-east region is environmentally sustainable.

b. River linking through artificial water channels might prove to be disastrous for aquatic biodiversity.

c. Concrete embankment of aquatic bodies are beneficial for the amphibian species as it might provide them with greater basking surface.

d. Rapid change in the environment may result in extinction because organisms may not have time to adapt.

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

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	b	c	d
(A)	1	3	2	4
(B)	3	4	2	1
(C)	4	3	2	1
(D)	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. Circumaustral	3. Distributed throughout the north temperate areas
d. Pantropical	4. North polar areas only

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

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 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	1
(B)	1	2	3	4
(C)	4	1	2	3
(D)	3	4	1	2

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 recuitment 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

P.T.O.