

1. Which among the following is a Gram positive bacterium?
A) *Saccharomyces cerevisiae* B) *Escherichia coli*
C) *Lactobacillus lactis* D) *Haemophilus influenzae*

2. In taxonomy, according to the Law of Priority,
A) When giving scientific names to animals the name of the genus should have priority before the species name.
B) When a new species is discovered, priority should be given to the name of the person who first described it.
C) The first properly published name of a species or genus takes precedence over any subsequently published one
D) A name once given to an organism should never be changed

3. Which among the following is true?
A) Prokaryotes lack mitochondrial mechanisms and hence depend only on NADPH as the energy currency.
B) Prokaryotes lack mitochondria, but have mitochondrial mechanisms which are capable of producing ATP.
C) Prokaryotes depend on fermentation pathways because they are incapable of producing ATP.
D) Prokaryotes have fully evolved mitochondria capable of producing ATP.

4. Which among the following is caused by a single nucleotide polymorphism?
A) Haemophilia B) Sickle cell anaemia
C) Down's syndrome D) Cri-du-chat syndrome

5. In mammals, the embryonic mesoderm gives rise to
A) Liver, pancreas and urinary bladder.
B) Trachea, lungs and the thyroid
C) Brain, spinal cord and notochord
D) Dermis, bone and connective tissue.

6. The international consortium for molecular taxonomy is
A) Linnaean society B) IUCN
C) COBOL D) ICZN

7. The difference between eukaryote and prokaryote mRNA is
A) Prokaryote mRNA has introns, while eukaryote mRNA has no introns.
B) Translation of mRNA into proteins occurs simultaneous with transcription in eukaryotes while it takes place separately in prokaryotes.
C) The eukaryote mRNA has a cap and a polyA tail while the prokaryote mRNA has no such parts.
D) Translation of mRNA in prokaryotes does not require ribosomes, while in eukaryotes, translation occurs in ribosomes.

8. The Lee–Boot effect is a phenomenon concerning the
- Suppression or prolongation of oestrous cycles of mature mice, when females are housed in groups and isolated from males.
 - Suppression or prolongation of oestrous cycles of mature mice, when males are housed in groups and isolated from females.
 - Suppression or prolongation of oestrous cycles of mature mice, when females are housed in groups
 - None of the above
9. Which among the following is true with respect to an aqueous solution of DNA?
- It is neutral
 - It is acidic
 - It is alkaline
 - DNA is not soluble in water
10. Which among the following is used for DNA barcode analyses?
- Genes for cyclo-oxygenase
 - Genes for cytochrome oxidase
 - Genes for LOX
 - Genes from the sex chromosomes.
11. In a cladogram
- The leaves denote clades, the nodes denote synapomorphs, the branches denote plesiomorphs and the length of the root denotes the evolutionary distances.
 - The leaves denote plesiomorphs, the nodes denote evolutionary distances, the branches denote synapomorphs and the length of the clades denotes evolutionary distances.
 - The leaves represent individual species, the nodes denote points of divergence, the branches denote lines of descendance and the length of the branches denote the evolutionary distances.
 - The leaves denote extant species, the nodes denote extinct species, the branches denote divergence and the length of the clades denote evolutionary distances.
12. The term “survival of the fittest” was coined by
- Charles Darwin
 - Hebert Spencer
 - Jeane Baptiste Lamarck
 - Alfred Russell Wallace
13. Class switching is the process by which
- B-cells and T-cells differentiate in the bone marrow.
 - Different types of antibodies are produced by the same T-cell.
 - Different types of antibodies are produced by the same B-cell.
 - Pluripotent stem cells in the bone marrow change their potency and form blood and immune cells.
14. The five kingdom classification and the three domain system were proposed by ----- and ----- respectively.
- Hugo-de Vries & Carl Woese
 - Robert Whittaker & Carl Woese
 - Charles Linnaeus & Carl Woese
 - Charles Darwin & Charles Linnaeus

29. The amendments to the Indian Forest Act of 1927 were enacted because
1. The Act of 1927 was created to serve the British need for timber.
 2. It did not acknowledge the presence or rights of tribals living in forests.
 3. It did not acknowledge rights of people who traditionally depended on forests and forest produce.
- A) Statements 1 and 2 are true B) Statements 2 and 3 are true
 C) Statements 1 and 3 are true D) All 3 statements are true
30. The class of antibody that is implicated in hypersensitive immune responses is
- A) Ig G B) Ig M C) Ig D D) Ig E
31. Which among the following is a genetically modified organism?
- A) Silver fish B) *Neon tetras*
 C) Glo fish D) *Bacillus thuringiensis*
32. The extreme stench produced by putrefying sea fish is due to
- A) The production and release of tertiary amines during decomposition.
 - B) The production and release of Hydrogen sulphide during putrefaction.
 - C) Ammonotelic nature of excretion.
 - D) Ureotelic nature of excretion.
33. A local population of polytypic species that actively interbreed with one another and share a distinct gene pool is called
- A) Niche species B) Zoonose
 C) Deme D) Metacommunity
34. Which among following statements qualify as a Biodiversity hot spot?
- Statement 1:** It must contain at least 0.5% or 1,500 species of vascular plants as endemics.
Statement 2: It should have lost at least 70% of its primary vegetation.
Statement 3: Demographic diversity in surrounding areas should be high.
- A) Statements 1, 2 and 3 B) Statements 1 and 2 only
 C) Statements 2 and 3 only D) Statements 1 and 3 only
35. Abnormal levels of anti-nuclear antibodies are seen in
- A) Systemic Lupus Erythematosus B) Phenylketoneurea
 C) Cruntzfeldt Jakob's Disease D) Chronic HIV infection
36. The cdk's are involved in
- A) DNA repair B) Cell division
 C) Cell signalling D) Producing antibodies
37. Which among the following viruses affect the human nervous system?
- A) HIV; Polio and Rabies B) HPV, HBV and Polio
 C) Rabies, Polio and JEV D) EBV, Rubella and SARS
38. Deficiency of folic acid during pregnancy can lead to
- A) Ventricular septal defect B) Atrial-septal defect
 C) Wiskott-Aldrich syndrome D) Spina bifida

46. In an ecosystem a community that is evolving towards its climax is termed as a ----- community
 A) Ecotonic B) Seral C) Lotic D) Pioneering
47. A phenomenon related to the transport of CO₂ by the red blood cells is
 A) Bohr effect B) Warburg effect
 C) Hamburger effect D) Crabtree effect
48. The gene required for proper development of speech and language regions of the brain during embryogenesis is
 A) LET 7 gene family B) COX gene family
 C) Forkhead (FOX) gene family D) Calmodulin gene family
49. In ethology, Flehmen response is an act that
 A) Results in maternal imprinting
 B) Initiates courtship behaviour
 C) Terminates courtship behaviour
 D) Facilitates transfer of pheromones into the vomeronasal organ
50. Cells that secrete spicules are known as
 A) Desmocytes B) Sclerocytes
 C) Lophocytes D) Archaeocytes
51. Pesticide with very low biodegradation and strong affinity for fatty tissues is
 A) Allerthrin B) Organochlorines
 C) Organophosphates D) Pyrethroids
52. The largest nesting sites of Olive Ridley turtles is
 A) Coromandel coast in Sri Lanka
 B) Gahirmatha Coast in Odisha
 C) Galapagos Islands
 D) Nancite Coast in Costa Rica
53. Identity the false statement with respect to the characteristic of the Nieuwkoop centre
 A) The site of entry of the sperm has no bearing on the position of the Nieuwkoop centre.
 B) Relocating the Nieuwkoop centre induces a new dorso/ventral axis.
 C) Once the Nieuwkoop centre is formed, it overrides the role of the dorsal lip of the blastopore.
 D) The Nieuwkoop Centre arises due to a gradient of nodal related proteins
54. The organ of insemination in penaeid species is
 A) Conglobate gland B) Utriculi majoris
 C) Bursa copulatrix D) Petasma
55. **Statement 1:** Eri silk is produced by *Artacus ricinii* while Tassar silk is produced by *Antharaea mylitta*
Statement 2: Eri silk is produced by *Antharaea mylitta* while Tassar silk is produced by *Artacus ricinii*.
Statement 3: The largest insect is the silk worm *Attacus atlas*.
- A) Statements 1 and 3 are correct B) Statements 2 and 3 are correct
 C) Statement 1 alone is correct D) Statement 3 alone is correct

56. Which among the following is a viviparous animal?
 A) Scoliodon B) Echidna C) Platypus D) Salamander
57. The scientific name of ship worm is
 A) Balanus B) Balanoglossus C) Teredo D) Nereis
58. The minimum forest cover recommended for a stable ecosystem in India is
 A) 17% of land area B) 25% of land area
 C) 33% of land area D) 50 % of land area
59. Which among the following is a larval stage of *Sacculina*?
 A) Veliger B) Kentrogen C) Tornaria D) Trochophore
60. The botryoidal tissue is seen in
 A) Nematomorpha B) Cestoda
 C) Nematoda D) Hirudinea
61. Signet ring stage is characteristic of the trophozoites of the malarial parasite in its
 A) Cycle of ROSS B) Endo-erythrocytic cycle
 C) Extra-corporeal phase D) Pre-erythrocytic cycle
62. Which among the following distinguishes terrestrial gastropods from aquatic gastropods?
 A) Presence of ommatophores in the aquatic gastropods, which is absent in terrestrial gastropods.
 B) Presence of ommatophores in the terrestrial, which is absent in aquatic gastropods.
 C) Presence of the osphradium in the aquatic gastropods, which is absent in the terrestrial gastropods.
 D) Presence of the osphradium in the terrestrial gastropods, which is absent in the aquatic gastropods.
63. Which among the following is not attributed to cholesterol?
 A) Membrane fluidity B) Insulation of nerves
 C) Synthesis of hormones D) Enhancement of membrane permeability
64. Dorsal blood vessel and ventral nerve cord is a characteristic feature of
 A) Marsupials B) Echinoderms
 C) Invertebrates D) Vertebrates
65. The bluish colour of blood in some invertebrates is due to
 A) Respiratory pigment containing copper as the metal cofactor.
 B) Incomplete or inefficient oxygenation of the respiratory pigment.
 C) Having an open circulatory system.
 D) The auricle receiving both oxygenated and deoxygenated blood
66. The organ of Bojanus which lies behind the pericardium in certain molluscs function as
 A) Auxillary heart B) Pace maker
 C) Excretory organ D) Respiratory apparatus
67. Black pearls are obtained from
 A) *Pinctada fucata* B) *Pinctada margaritifera*
 C) *Pinctada vulgaris* D) *Perna viridis*

68. Consider the following statements:
1. Members of the Phylum Echinodermata are exclusively marine with the exception of a few species in the Sunderbans.
 2. Even though adult echinoderms show radial symmetry, the location of the madreporite in *Asterias* make them bilaterally symmetrical.
- A) Both statements are wrong.
 B) Both statements are correct.
 C) Statement 1 is correct while statement 2 is wrong.
 D) Statement 1 is wrong while statement 2 is correct.
69. A distinguishing feature seen in hemichordates is
- A) Absence of ganglion in the nerve cord
 - B) Presence of both dorsal and ventral blood vessels.
 - C) Absence of pharyngeal gill slits.
 - D) Presence of a dorsal heart.
70. The guinea worm disease is caused by
- | | |
|------------------------------|-----------------------|
| A) <i>Loa loa</i> | B) <i>Trichinella</i> |
| C) <i>Trichuris trichura</i> | D) <i>Dracunculus</i> |
71. Belt and spot desmosomes are members of the ----- family of proteins.
- | | |
|--------------|------------|
| A) Selectins | B) Serpins |
| C) Cadherins | D) GPCR |
72. Antheridia and archaegonia are
- A) Microgametes of *Chlamydomonas* and *Ceratium* respectively.
 - B) Sexual microgametes of *Chlamydomonas*.
 - C) Sexual stages of *Paramecium*.
 - D) Products of plasmotomy in *Actinosphaerium*.
73. The bacterium that causes syphilis is
- A) *Neisseria gonorrhoeae*
 - B) *Mycoplasma genitalium*
 - C) *Treponema pallidum*
 - D) *Chlamydia trachomatis*
74. In *Euglena* the effective stroke and the recovery stroke results in
- A) Forward movement associated with rotation around its axis.
 - B) 'Run and Tumble' motion.
 - C) Swimming backwards.
 - D) Bringing food materials to the cytostome.

75. Consider the following statements:

Statement 1: *Trypanosoma brucei gambiense* causes sleeping sickness in man.

Statement 2: *Trypanosoma brucei rhodesiense* is another pathogen causing sleeping sickness.

Statement 3: Sand flies serve as the vector for *Trypanosoma* parasites.

Statement 4: *Trypanosoma* is bacterium.

- A) Statements 1 and 3 are correct
- B) Statements 2 and 4 are correct.
- C) Statements 1 and 2 are correct.
- D) Statements 3 and 4 are correct

76. The mode of nutrition in *Vorticella* is

- A) Saprozoic
- B) Holozoic
- C) Parasitic
- D) Phagocytic

77. The vector that transmits plague to human beings is

- A) Rats
- B) *Aedes* mosquito
- C) *Yersinia pestis*
- D) *Xenopsylla cheopis*

78. **Assertion:** In chordates identical offspring can form only at the very early stages of embryogenesis.

Reason: In chordates, cleavage is indeterminate which results in the formation of equally potent blastomeres.

- A) The Assertion is correct and the Reason stated is true, but it does not substantiate the Assertion.
- B) The Assertion is correct, the Reason stated is true and it substantiates the Assertion.
- C) The Assertion is incorrect, but the Reason stated is true in itself even though it does not substantiate the Assertion.
- D) Both Assertion and the Reason given are wrong.

79. The most primitive metazoan is

- A) Placozoa
- B) Scyphozoa
- C) Porifera
- D) Hydrozoa

80. **Assertion:** Metagenesis in *Obelia* is not considered as true alternation of generations.

Reason: Both the sedentary asexual polypoid and the mobile sexual generation are diploid

- A) Both Assertion and the Reason given are false
- B) Both Assertion and the Reason given are true.
- C) The Assertion is true but the Reason given is false.
- D) The Assertion is false but the Reason given is true.

81. A patient admitted to a hospital was diagnosed to carry cysticerci in his muscle and brain tissues. The most plausible explanation for it could be
- A) Accidental ingestion of food contaminated with human faeces.
 - B) Accidental ingestion of food contaminated with pig faeces.
 - C) Ingestion of improperly cooked pork.
 - D) Receiving blood from a person infected with *Taenia solium*.
82. The vitamin associated with coenzyme A is
- A) Vitamin A
 - B) Vitamin C
 - C) Pantothenic Acid
 - D) Pyruvate
83. A characteristic feature of the nuclear pore complex is
- A) They extend seamlessly into endoplasmic reticulum.
 - B) The presence of phenylalanine-glycine repeats.
 - C) Attachment of large number of mitochondria
 - D) Presence of Na⁺/ K⁺ pumps.
84. The limbs, ears, and other appendages of the animals living in cold climates tend to be shorter than in animals of the same species living in warm climates. This principle is known as
- A) Allen's rule
 - B) Bergmann's rule
 - C) Gloger's rule
 - D) Hardy's rule
85. The rich colouration of coral reefs is due to
- A) Deposition of sediments of different colours depending on the soil of the sea coast.
 - B) Remnants of dead zooxanthellae.
 - C) The presence of live zooxanthellae.
 - D) Bleaching caused by acidification and rise in temperature due to green house effect.
86. The scientific name for lung fluke is
- A) *Fasciola hepatica*
 - B) *Paragonimus westermani*
 - C) *Fasciolopsis buski*
 - D) *Diphyllobothrium*
87. A drug that is designed to occupy the active site of an enzyme will be effective when
- A) The thermodynamic energy is highest in its bound state.
 - B) The substrate concentration is very high.
 - C) It forms a stable complex within the active site.
 - D) It forms an unstable complex with the active site.
88. Antigens that cause non-specific activation of T-lymphocytes are called
- A) Immunogens
 - B) Pseudo-antigens
 - C) Super antigens
 - D) Alloantigens
89. A woman who is having trouble in getting pregnant will be treated with
- A) Human chorionic gonadotropin
 - B) Oxytocin
 - C) Somatotropin
 - D) Luteinising hormone

90. In a colorimetric experiment that applies the Beer-Lambert's law, the concentration vs optical density graph will lose linearity when
- The path length is constant
 - The wave length of incident light is constant.
 - Intensity of incident light does not change.
 - Extremes of concentration are reached
91. Lanolin secreted by the sebaceous glands of wool-bearing animals is a
- Phospholipid
 - Steroid hormone
 - Sugar
 - Wax
92. In Chi-square analyses
- Statement 1:** A prior estimate of the outcome is necessary.
- Statement 2:** Differences between the expected and observed values decide the truthfulness of the experiment.
- Both statements are true.
 - Statement 1 is true while statement 2 is false.
 - Statement 1 is false because estimating the outcome of an experiment before conducting it is wrong and unethical; statement 2 is correct.
 - Both statements are false.
93. When the significance of the outcome of an experiment is expressed at probability of '5%' it means that:
- The results of the experiment are true 5% of the number of times it is conducted
 - The null hypothesis is true 95% of the number of times the experiment is conducted
 - The null hypothesis is true 5% of the number of times the experiment is conducted
 - The experiment has been repeated 5 times.
94. The entropy of a biomolecule can be estimated using a
- Colorimeter
 - Calorimeter
 - Flame photometer
 - NMR spectroscope
95. Which among the following animal/s seen in the forests of Kerala is considered as 'most endangered'?
1. *Macaca silenus* 2. *Nilgiritragus hylocrius* 3. *Oryx capensis*
- 1 and 2 only
 - 1 and 3 only
 - 2 and 3 only
 - 1 only
96. The development of the anterior-posterior axis in fruit flies is controlled by
- Homeotic genes
 - Maternal effect genes
 - Segmentation genes
 - All of these
97. Glyceraldehyde is a
- Dialdehyde
 - Fatty aldehyde
 - Sugar
 - Sugar derivative
98. Which one of the following enzyme is inhibited by Cyanide?
- Amylase
 - Cytochrome oxidase
 - Enolase
 - Urease

99. In an odd chain fatty acid that is being catabolically degraded the last product is
 A) Acetyl CoA only
 B) Acetyl CoA and propionyl-CoA
 C) Propionyl-CoA only.
 D) Carbonic anhydrase.
100. The rationale behind blue/white colony selection in rDNA technology is that
 A) Bacteria carrying the inserted gene produce blue pigments while others do not.
 B) Blue dye in the culture medium are decolourised by recombinant colonies.
 C) Correct insertion of the gene inhibits the beta-galactosidase enzyme expressed by the lac-operon cassette.
 D) Correct insertion of the gene disrupts alpha complementation of the lac-operon system.
101. A person tries to lift a heavy object without success even though his muscles are fully extended. This type of muscle contraction is
 A) Isotonic contraction
 B) Fatigue
 C) Distension
 D) Isometric contraction
102. Identify the correct match:
- | | | | |
|---------------|-----------------------|----------------|----------------------|
| List I | | List II | |
| 1 | Erythropoietin | P | Atrial septal defect |
| 2 | Haldane effect | Q | Homeostasis |
| 3 | von Villibrand Factor | R | Kidneys |
| 4 | Foramen ovale | S | Respiration |
| | | T | Haemostasis |
- A) 1-Q; 2-S; 3-T, 4-P
 B) 1-T; 2-S, 3-Q; 4-P
 C) 1-R; 2-S; 3-T; 4-P
 D) 1-S; 2-Q; 3-T; 4-R
103. According to the Ramachandran plot:
 A) For a protein to be functional, all amino acids have to in the allowed regions i.e. in Quadrant I only.
 B) For a protein to be functional, all amino acids have to be equally distributed within the allowed and disallowed regions i.e. between quadrants I and IV.
 C) Glycine gives the least flexibility since it does not have a complex side chain.
 D) The two torsion angles which describe the rotations of the polypeptide backbone around the bonds between N-C α and C α -C determine the structure of a protein.
104. The major fatty acid found on royal jelly, which is used in the nutrition of larvae and adult queen honeybees, is
 A) 10-hydroxy-2-decenoic acid
 B) Arachidonic acid
 C) Docosahexaenoic acid
 D) Linoleic acid
105. In a community, a particular inherited abnormality was seen to be an X-linked recessive trait. In one family, the following information is noted:
 1. The mother shows the abnormality.
 2. Their only child is a daughter who is normal.
 If their next child is a son, what is the probability that he will show the abnormality? And what is the probability that the next child born will be a daughter showing the abnormality?
 A) 1, 1
 B) 1, 0
 C) 0, 1
 D) 0, 0

106. Which among the following is used in probiotic formulations to treat diarrhoeal diseases?
 A) *Lactobacillus* species B) *Clostridium* species
 C) *Escherichia coli* D) *Enterococcus* species
107. The experimental laboratory bred animal deficient in thymus which are used for immunological research is
 A) Sprague Dawley rats B) Nu/nu mouse
 C) BALB/c mouse D) Bonobo monkeys
108. The nucleotide sequence that stops transcription is
 A) AUG B) Shine-Dalgarno sequence
 C) Stop codon D) None of the above
109. Down's syndrome is an example for
 A) Aberration due to aneuploidy B) Aberration due to polyploidy
 C) Chromosomal mutation D) Mutation in mitochondrial genes
110. The organelle that functions as the microtubule organising centre (MTOC) is
 A) Nucleolus B) Centriole
 C) Endoplasmic reticulum D) Tubulin
111. A gene influences two or more seemingly unrelated phenotypic traits is termed as
 A) Pseudogene B) Co-dominant
 C) Pleiotropic D) Cryptic genes
112. The monomeric units of the cytoskeleton is
 A) Collagen B) Tubulin C) Centrioles D) Chondrocytes
113. Which among the following is a condition for the activation of the trp-operon?
 A) Activation of the trp Are
 B) Absence of tryptophan in the environment
 C) Presence of tryptophan in the environment.
 D) Mutation in the tryptophan synthesis gene.
114. The distance between genes in a chromosome is expressed in
 A) Nucleotide base pairs B) Goldstein distance
 C) Haldane index D) Centimorgan
115. Rigor mortis sets in about four hours after death. Which among the following are valid reasons for the setting in of rigor mortis?
 1. Production of ATP by glycolysis continues up to four hours post mortem and ceases thereafter resulting in rigor mortis.
 2. Production of ATP by mitochondria continues up to four hours post mortem and ceases thereafter resulting in rigor mortis.
 3. Effect of Calcium ions released from the disintegrating mitochondria as well as from reserves in the cytosol.
 4. Degradation of myosin heads.
 A) 1, 2 and 3 only B) 1, 2, 3 and 4 C) 1 and 3 only D) 4 only

