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- The term taxonomy was coined by:  
A) de Candolle                      B) Carolus Linnaeus  
C) Simpson                            D) Aristotle
  - Determination of the ancestral relationship of organisms and the group's evolutionary history through time is called:  
A) Phylogenetics                      B) Systematics  
C) Phylogeny                            D) Hierarchical system
  - Branching diagram that depicts species divergence from common ancestors is known as:  
A) Seismogram                          B) Cladogram  
C) Plesimogram                        D) Phylogram
  - Which of the statement given below about different Taxa is/are **FALSE**:
    - All animals in a monophyletic group develop from a common ancestral form, but all descendants of that form are not included in the group
    - All organisms in a paraphyletic group have a common ancestor, but the group does not include all the descendants of the recent common ancestor
    - Taxonomic groups that contain organisms that are descendants of more than one ancestor are called polyphyletic
    - If all organisms in a group have developed from a common ancestral form and all descendants of that form are included in the group, then the group is said to be monophyletic  
A) 1 and 2 only                            B) 1, 3 and 4 only  
C) 2 and 3 only                            D) 1 only
  - Match the following:

List I	List II
1. Kingdom Protista	a. Motile chemoheterotrophs
2. Kingdom Plantae	b. Nonmotile chemoheterotrophs
3. Kingdom Fungi	c. Multicellular photoautotrophic eukaryotes
4. Kingdom Animalia	d. Unicellular colonial eukaryotes

  
A) 1-b, 2-a, 3- d, 4-c                      B) 1-b, 2-c, 3-d, 4-a  
C) 1-d, 2-c, 3-b, 4-a                      D) 1-a, 2-d, 3-b, 4-c
  - A single specimen designated as a type in the original description is named as:  
A) Neotype                                B) Syntype  
C) Paratype                                D) Holotype

7. Assertion (A) – An evolutionary trend towards the concentration of sensory structures on the anterior end is cephalization, which is associated with bilateral symmetry.  
Reason (R) – The anterior end of a moving animal is usually the first to encounter food , external threats and other stimuli.
- A) Both A and R are true, but R is not the correct explanation of A  
B) Both A and R are true and R is the correct explanation of A  
C) A is true and R is false  
D) A is false and R is true
8. Which of the following statements about germ layers given below are TRUE?
1. The coelomic epithelium that lines the inner aspect of the body wall is named parietal peritoneum.
  2. The coelomic epithelium which lines the outer aspect of the gut is called visceral peritoneum
  3. In eucoelomata the body cavity between the digestive tract and body wall is completely lined with mesodermally derived coelomic epithelium
  4. A body cavity between the body wall and digestive tract, which is not lined both externally and internally by coelomic epithelia is called a coelom
- A) 1, 2 and 4 are true                      B) 1, 2 and 3 are true  
C) 2, 3 and 4 are true                      D) 1 and 3 are true
9. Out of the following Phyla, the skeleton of which one consists of spicules composed of calcareous or siliceous materials  
A) Mesozoa      B) Porifera      C) Cnidaria      D) Ctenophora
10. Rotifers possess a prominent muscular modification of the pharynx called:  
A) Mastak                                      B) Lorica  
C) Trophi                                        D) Cement gland
11. In which continent the giant earthworms are seen?  
A) New Zealand    B) Antarctica      C) Australia      D) Africa
12. Characteristic larva of the Phylum Mollusca:  
A) Actinotrocha                                B) Veliger  
C) Trochophore                                 D) Zoea
13. The animal kingdom was divided into Metazoans and Protozoans by:  
A) Carl Linnaeus                                B) Jean Baptiste Lamarck  
C) Ernst Haeckel                                D) Charles Darwin
14. Phylum in which body is devoid of locomotory cilia and flagella  
A) Annelida                                      B) Mollusca  
C) Echinodermata                                D) Arthropoda

15. Match the following:
- |  |  |
|--|--|
| <p>List I</p> <ol style="list-style-type: none"> <li>1. <i>Pyrilla perpusilla</i></li> <li>2. <i>Nilaparvata lugens</i></li> <li>3. <i>Nepantia serinopa</i></li> <li>4. <i>Aspidiotus destructor</i></li> </ol> | <p>List II</p> <ol style="list-style-type: none"> <li>a. Rubber plant</li> <li>b. Coconut palm</li> <li>c. Paddy</li> <li>d. Sugar cane</li> </ol> |
|--|--|
- A) 1-c, 2-d, 3-b, 4-a      B) 1-d, 2-c, 3-b, 4-a  
C) 1-d, 2-b, 3-c, 4-a      D) 1-a, 2-d, 3-c, 4-b
16. Among the following which is NOT a pest of stored food grain?
- A) *Sitophilus oryzae*      B) *Trogoderma granarium*  
C) *Tribolium castaneum*      D) *Acanthosyces nelleri*
17. Assertion (A) – Tusser silk industry has not reached up to the mark as the mulberry silkworm industry  
Reason(R) – The domestication of tusser caterpillars is not so easy and it's breeding is not well controlled in captivity
- A) Both A and R are false and R is not the reason for A  
B) Both A and R are true and R is the reason for A  
C) A is true, but R is false.  
D) A is false and R is true.
18. Among the following species of honey bee, find out the best one from the commercial point of view:
- A) *Apis dorsata*      B) *Apis indica*      C) *Apis mellifera*      D) *Apis florea*
19. In the case of induced bund breeding in fish aquaculture program, which of the following factors induce bund breeding of 'hardly spawning'?
1. Heavy monsoon      2. Water current
  3. Temperature between 24 to 32°C      4. Cloudy season followed by thunderstorm
- A) 1 & 2 only      B) 1, 2 & 4 only      C) 1, 2 & 3 only      D) 1, 2, 3 & 4
20. The intermediate stage in the decomposition of the organic matter into minerals is called:
- A) Detritus      B) Litter      C) Humus      D) All of the above
21. Diversity of species in the range of all community is known as:
- A) Alpha diversity      B) Beta diversity  
C) Gamma diversity      D) Omega diversity
22. The sequence of living organisms in a -----in which one organism consumes another organism to transfer food -----is called a food chain.
- A) Population, Energy      B) Community, Energy  
C) Ecosystem, Pyramid      D) Pyramid, Energy
23. Which one among the following is not a nonbiological fixation of Nitrogen cycle?
- A) Lightning      B) Bluegreen algae  
C) Cosmic radiations      D) Meteorites

24. Which among the following is an example for aerobic non-symbiotic nitrogen fixer?  
 A) Frankice B) *Rhizobium* C) *Azotobacter* D) *Azospirillum*
25. Biodiversity comprises the distinct components namely:  
 A) Ecological diversity B) Species diversity  
 C) Genetic diversity D) All of the above
26. Among the following, find out the reason/s for the loss of biodiversity  
 1. Unplanned development 2. Inappropriate legal systems  
 3. Some agricultural and forestry practices 4. Global trading system  
 A) 1, 2 & 3 only B) 1, 2 & 4 only C) 1, 2, 3 & 4 D) 1, 3 & 4 only
27. Rain forests found near the cooler coastal areas further north or south of the equator is known as:  
 A) Tropical Rain forest B) Temperate Rain forest  
 C) Alpine forest D) Tropical scrub jungle
28. UNEP deals with the global environmental issues and has its head quarter at:  
 A) Germany B) Switzerland C) France D) Kenya
29. The author of the book "Ecology of Commerce":  
 A) Paul Hawken B) Aldo Leopold  
 C) Mahatma Gandhi D) Gro Harlem Brundtland
30. Types of learning exhibited by animals:  
 A) Habituation B) Latent learning  
 C) Insight learning D) All of the above
31. Who introduced imprinting?  
 A) Maier B) Kohler C) Lorenz D) Lashley
32. Constituent of bile that helps in the emulsification of fat in the alimentary canal:  
 A) Bilirubin B) Biliverdin C) Bile salts D) LDL
33. The point at the inferior portion of the trachea, where it branches to form the right and the left primary bronchus is named:  
 A) Carina B) Tracheolus C) Hilus D) Bolus
34. Middle thin layer of the human eye is called:  
 A) Sclera B) Choroid C) Retina D) Ora serrata
35. Which hormone injections are given at the onset of childbirth to increase contractions of the uterus?  
 A) Oxytocin B) Prolactin  
 C) FSH D) Progesterone and Estrogen

36. Assertion (A)-- Mitochondria in striated muscle fibres are large and numerous  
Reason (R) --Striated muscle cells are found throughout the animal kingdom, from sponges to insects and from insects to mammals
- A) Both A and R are true, but R is not the reason for A  
B) A is true and R is the reason for A  
C) Both A and R are false  
D) A is false and R is true
37. What are the phases of inflammatory response?  
A) Fluid phase                                  B) Cellular phase  
C) Healing phase                                D) All of the above
38. The first stage in gametogenesis includes  
A) Proliferation phase                        B) Growth phase  
C) Multiplication phase                      D) Maturation phase
39. Which type of a blastula is seen in insects?  
A) Coeloblastula                                B) Stereoblastula  
C) Discoblastula                                D) Periblastula
40. Restitution occurs during:  
A) Meiotic thelytoky                          B) Aneuploid thelytoky  
C) Arrhenotoky                                  D) Autofertilization
41. Assertion (A) – Amniocentesis is not performed before the 15<sup>th</sup> week of gestation  
Reason (R) – Before this stage the amount of amniotic fluid is insufficient to permit safe extraction for culturing
- A) Both A and R are false and R is not the reason for A  
B) A is true and R is false  
C) Both A and R are false  
D) Both A and R are true and R is the reason for A
42. The type of placenta in humans  
A) Monodiscoidal                              B) Bidiscoidal  
C) Cotyledonary                                D) Diffuse
43. Beta oxidation of fatty acids result in the production of  
A) Glucose                                        B) CO<sub>2</sub> and water  
C) Pyruvate                                      D) Acetyl Co-A
44. Which is the first visible product of Calvin cycle?  
A) Glyceraldehyde                             B) Oxaloacetic acid  
C) 3-phospho-glyceraldehyde              D) 1-phospho-3-glyceraldehyde

45. At which part of the mitochondria, fatty acids are linked to coenzyme A before they are oxidized:
- A) Inner membrane                      B) Outer membrane  
C) Cristae                                 D) Matrix
46. The synthesis of inosinic acid begins with:
- A) 5-phospho ribosyl phosphate  
B) D-ribose-5-phosphate  
C) Glycinamide ribotide  
D) 2-amino-N-ribosylacetamide
47. L-threonine is converted into L-isoleucine by a sequence of 5 enzymes. The first enzyme threonine dehydratase is inhibited by the end product of the sequence, L- isoleucine. This kind of regulation is known as:
- A) Allosteric modulation              B) Allosteric inhibition  
C) Neither A nor B                      D) Both A and B
48. The two ends of every protein molecule are distinct. One end has a free -----group and the free end has a free -----group.
- A) Amino, Carboxy                      B) Carboxy, Amino  
C) Amino, Aceto                         D) Carboxy, Aceto
49. Vitamin deficiency disorder scurvy is caused by:
- A) Vitamin B<sub>1</sub>    B) Vitamin C    C) Vitamin D    D) Vitamin B<sub>12</sub>
50. Electron microscope has a resolving power of:
- A)  $1\text{Å} - 5\text{Å}$                               B)  $2\text{Å} - 7\text{Å}$   
C)  $0.2\text{Å} - 10.0\text{Å}$                          D)  $1.2\text{Å} - 8\text{Å}$
51. Rf value in Chromatography can be calculated by the formula:
- A)  $\frac{\text{Distance travelled by the solvent}}{\text{Distance travelled by the substance}}$   
B)  $\frac{\text{Distance travelled by the substance}}{\text{Distance travelled by the solvent}}$   
C)  $\frac{\text{Distance travelled by the solute}}{\text{Distance travelled by the solvent}}$   
D)  $\frac{\text{Distance travelled by the substance}}{\text{Distance travelled by the solute}}$
52. Nuclear magnetic resonance was first described and measures in molecular beams by:
- A) Isidor Rabi                              B) Felix Bloch  
C) Edward Mills Purcell                D) Russel H Varlan
53. Out of the following which is not an instance of interaction between allelic genes?
- A) CO-epistatic genes                    B) Inheritance of lethal genes  
C) Incomplete dominance                D) Co-dominance

54. The type of arrangement with two wild type alleles on the same chromosome is called ----- and this type of relationship of wild type and mutant linked genes is called -----.
- Trans arrangement, Repulsion
  - Cis arrangement, Coupling
  - Trans arrangement, coupling
  - Cis arrangement, Repulsion
55. Paramaecin is a substance secreted by:
- Paramecium aurelia sensitive strain, which is toxic to sensitive strain
  - Paramecium aurelia killer strain, which is toxic to the sensitive strain
  - Paramecium aurelia killer strain, which is toxic to both killer and sensitive strain
  - Paramecium aurelia sensitive strain, which is not at all toxic to both strains
56. The first step in the preparation of cDNA from mRNA is:
- Isolation of mRNA
  - Replacement of mRNA
  - Addition of DNA strand
  - None of the above
57. For which type of work, Kary Mullis was awarded Nobel Prize in 1993:
- RNA amplification by Plasmids
  - DNA amplification by Polymerase Chain Reaction
  - Synthesizing complementary DNA strand on DNA template by DNA polymerase
  - Sealing the gap between DNA strands by ligases
58. Western blot technique was named in 1981 by:
- Neal Burnette
  - Edwin Southern
  - James Alwine
  - David Kemp
59. Achondroplasia:
- Is a genetic disorder due to autosomal dominant mutation
  - Is an inherited disorder due to autosomal recessive mutation
  - Is a hereditary disease caused by a single gene mutation
  - Is an abnormality due to monosomy of sex chromosome
60. A few statements about viruses are given below. Find out which one is FALSE
- Some of the smaller viruses are only 200 Å in diameter
  - They lack a cellular structure
  - They have an independent metabolism
  - Many of the smaller viruses can be crystallized and they behave like chemicals
61. Name the phenomenon by which some species of bacteria exhibit great variation in the shape and size of individual cells:
- Pleiotropism
  - Amphitrichism
  - Pleomorphism
  - Polymorphism
62. Out of the following types of endoplasmic reticulum, which type is responsible for the Synthesis of fat?
- Vesicles
  - Rough endoplasmic reticulum

- C) Smooth endoplasmic reticulum  
D) Tubules
63. M-phase in cell cycle is:  
A) When RNA and proteins are synthesized and there is no DNA replication  
B) The period from the end of the S-phase until mitosis  
C) The period of actual division corresponding to the visible mitosis  
D) The transition from G1-phase to the period S-phase
64. Mitotic chromosomes are transcriptionally inactive:  
A) Condensed form of chromatin prevents RNA polymerase from gaining access to DNA  
B) Energy needed for transcription is diverted for some other purposes  
C) RNA polymerase and the S-factor contained in it get denatured when combined with spindle forming molecules  
D) During mitosis, no transcription takes place
65. Out of the following type of endoplasmic reticulum (ER), which one possesses more pores?  
A) Annulate ER B) Rough ER C) Smooth ER D) Transitional ER
66. Among the following statements, which one is NOT TRUE about cancer?  
A) In cultured malignant cells, fibronectin is either absent or much reduced  
B) 'Hayflick' limit is well established in cancer cells  
C) Carcinomas are cancers arising from the epithelial cells of ectoderm and endoderm and include approximately 80-85% of human cancers  
D) Cancer cells usually show nuclear and nucleolar hypertrophy
67. In which of the following base pairs, will DNA melt at the lowest temperature?  
A) 5' ATGCTGAT-3'      B) 5'-GCATAGCT-3'  
3'-TACGACTA-5'      3'-CGTATCGA-5'  
C) 5'-AATAAAGC-3'      D) 5'-AATGCTGC-3'  
3'-TTATTTTCG-5'      3'-TTACGACG-5'
68. Terminism is the formation of:  
A) A DNA from RNA  
B) A RNA from DNA  
C) Monocistronic mRNA from DNA  
D) Ending of DNA replication
69. The process by which expression of genes is turned on in response to a substrate in the environment is called:  
A) Induction B) Repression C) Regulation D) Promotion
70. A few statements about the components of Lac operon are given below .Find out which one is false?  
A) A set of structural genes  
B) A promoter gene to which the enzyme DNA polymerase binds and initiates the transcription of structural genes  
C) An operator site, which is a DNA sequence that regulates transcription of the structural Genes  
D) A regulator gene, which encodes a protein that recognizes the operator sequence



71. Assertion (A) – A lot of energy can be saved by regulating the gene expression at the first stage (transcription) itself  
Reason (R) – Gene expression occurs through corresponding protein synthesis and it is an energy consuming process
- A) Both A and R are false and R is not the reason for A  
B) Both A and R are true and R is the reason for A  
C) A is true and R is false  
D) A is false and R is true and R is the reason for A
72. In the Henle's loop, during the process of reabsorption:  
A) Excess salts and water are added to the blood  
B) Excess hydrogen ions are removed from the blood  
C) Glucose, salt and water are returned to the blood  
D) Drugs and other poisons are removed from the blood
73. A character that is shared, derived and common between an ancestor and its descendants is known as:  
A) Plesiomorphic  
B) Apomorphic.  
C) Synapomorphic  
D) Autoapomorphic.
74. Match the following
- |                    |                    |
|--------------------|--------------------|
| List I             | List II            |
| 1. Parazoa.        | a. Ctenophora      |
| 2. Radiata         | b. Rotifers        |
| 3. Acoelomate      | c. Sponges         |
| 4. Psuedocoelomate | d. Platyhelminthes |
- A) 1-a, 2-c, 3-b, 4-d  
B) 1-c, 2-a, 3-b, 4-d  
C) 1-b, 2-d, 3-a, 4-c  
D) 1-c, 2-a, 3-d, 4-b
75. The immediate ancestors of the genus Homo is  
A) Homo floresiensis  
B) Australopithecus  
C) Homo neanderthalensis  
D) Pan paniscus
76. The phylogenetic tree that has branch lengths proportional to the amount of character change of its member species is:  
A) Dendrogram  
B) Cladogram  
C) Chronogram  
D) Phylogram
77. Any evolutionary change at or above the level of species is called:  
A) Micro evolution  
B) Co evolution  
C) Mega evolution  
D) Macro evolution
78. Male-induced implantation failure is known as:  
A) Bruce effect  
B) Flehmen  
C) Vander Bergh effect  
D) Whitten effect

79. Interleukins are a class of cytokines classified on structural features. Interleukin 2 stimulates:
- the formation of red and white blood cells from stem cells
  - $T_H$  cells in presence of antigens, chemically attracts phagocytes in inflammatory response
  - proliferation of antigen-stimulated  $T_H$  cells, proliferation and differentiation of B- cells and activation of  $T_C$  cells and  $N_K$  cells
  - activity of macrophages against microbes and tumour cells, inhibits intracellular viral replication
80. Stationary phase of cation exchange chromatography is:
- Negatively charged
  - Positively charges
  - Zwitter ionic
  - No charge
81. A few statements are given below about correlation. Find out which one is NOT TRUE?
- The relationship between two variables is such that a change in one variable does not result in a change in the other variable
  - The correlation may be positive, zero or negative
  - There will be no linear relation in variables in zero correlation
  - There are 3 popular methods of studying correlation, i.e., scatter diagram, rank correlation and Karl Pearson's coefficient of correlation
82. In RFLP:
- Several different restriction endonucleases are used to produce DNA fragments of different lengths.
  - Restriction endonucleases cleave DNA at random locations.
  - A specific endonuclease which cuts DNA at specific sequences is used.
  - Polymorphic DNA are amplified by PCR to obtain DNA of different sizes.
83. -----introduced the category, **family**, between the levels order and genus and ----- added a new category, **Phylum**, above the level of class.
- Butschli, Haeckel
  - Haeckel, Butschli
  - Butschli, Linnaeus
  - Butschli, Whittaker
84. The recognition sequence of the restriction enzyme *TaqI* is:
- TCGA  
AGCT
  - AAGCTT  
TTCCAA
  - GAATTC  
CTTAAG
  - AGCT  
TCGA
85. The honey bees that are domesticated are:
- Apis cerana indica* and *Apis florea*.
  - Apis cerana indica* and *Apis andreniformis*.
  - Apis dorsata* and *Apis cerana indica*.
  - Apis mellifera* and *Apis cerana indica*.
86. Identify the correct match:
- |                                 |                                 |
|---------------------------------|---------------------------------|
| 1. Sericin                      | p. Cormorant                    |
| 2. <i>Ceratovacuna lanigera</i> | q. <i>Perna viridis</i>         |
| 3. Guano                        | r. <i>Bombyx mori</i>           |
| 4. Raft culture.                | s. <i>Saccharum officinarum</i> |
- 1-s; 2-r; 3-p; 4-q
  - 1-r; 2-q; 3-p; 4-s
  - 1-q; 2-p; 3-s; 4-r
  - 1-r; 2-s; 3-p; 4-q

87. Assertion (A): The wings of the bird and bat are analogous as wings, but homologous as forelimbs.  
Reason (R) : Birds and bats did not inherit wings from a common ancestor with wings, but they did inherit forelimbs from a common ancestor with forelimbs.
- A) Both A and R are true, and R is the reason for A  
B) A and R are true, and R is not the reason for A  
C) A and R are false  
D) A is false, but R is true
88. Find out from the following, which is an example of a non-obligatory mutualism  
A) Lichen  
B) Roots of certain leguminous plants and *Rhizobium radicum*  
C) Wood-eating termites and *Trichonympha*  
D) Aphids and ants
89. The evolutionary era in which reptiles were dominant:  
A) Hadean      B) Archean      C) Proterozoic      D) Phanerozoic
90. Among the following, which one is **not** an outcome of acid rain pollution?  
A) In Ontario, Canada, almost the entire biota of about 1200 lakes have been wiped out  
B) At St. Paul's cathedral in UK, the stone work is being eaten away at the rate of an inch every 100 years  
C) The great monument Taj Mahal is exposed to the corrosive action  
D) Irritation of mucous membrane, bronchial constriction and eye irritation in man
91. The appearance of a species as a fossil record is an example for:  
A) Neutral evolution      B) Punctuated equilibrium  
C) Founder effect      D) Genetic mutations that cause extinction
92. Identify the wrong statement.  
A) A population bottleneck results in the reduction of robustness of the surviving population with respect to adapting to subsequent selecting environmental changes.  
B) High rates of gene flow can reduce the genetic differentiation between two groups, increasing homogeneity and increasing the chances of speciation.  
C) A large gene pool is associated with extensive diversity and robust populations that can survive periods of intense selection.  
D) A consequence of a smaller population size is the accumulation of mutations in the population.
93. A species whose removal results in the collapse of a stable community is known as  
A) Apex organism      B) Flagship species  
C) Keystone species      D) Umbrella species
94. Identify the disease that can occur as a consequence of improper management of municipal solid waste.  
A) Cancer      B) Plague  
C) Life-style diseases      D) Itai-itai disease

95. Water for drinking should have a BOD  
 A) More than 1 mg per litre  
 B) Less than 1 mg per litre  
 C) Between 1 and 1.5 mg per litre  
 D) None of the above
96. The biodiversity hotspots in India are  
 A) The Himalayas, the Western Ghats and the Andamans.  
 B) The Himalayas, the Western Ghats, the Indo-Burma region.  
 C) The Himalayas, the Western Ghats, the Indo-Burma region and the Andamans.  
 D) The Western Ghats, Gangetic plains and those Himalayas.
97. The mean species diversity in a habitat at the local level sub-unit is known as  
 A) Alpha diversity                      B) Beta diversity  
 C) Gamma diversity                      D) Isolation index
98. Statement 1: Introduction of alien species contributes to changes in ecosystem function.  
 Statement 2: Food production using introduced alien species has been beneficial to mankind.  
 A) Both statements are true and supplement each other.  
 B) Both statements are true in themselves, but are independent of each other.  
 C) Both statements are true, but contradict each other.  
 D) Statement 1 is true, but statement 2 is false and contradicts statement 1.
99. Which among the following phenomena is closely associated with the formation of rain?  
 A) Green house effect                      B) Adiabatic cooling  
 C) Rising winds                              D) Presence of mountain ranges
100. On which type of monochromatic light is based on Raman spectroscopy?  
 A) Elastic scattering                      B) Plastic scattering  
 C) Inelastic scattering                      D) Neolastic scattering
101. The quote "what use is a sawmill without a forest?" by Herman Daly refers to:  
 A) Environmental justice  
 B) Sustainable development  
 C) Importance of re-planting of forests with trees that can be used for timber  
 D) In-situ conservation strategies
102. The Amoco Cadiz disaster was caused by:  
 A) Explosion of a chemical factory owned by the Amoco Corporation in Indiana.  
 B) Oil spillage along the coast of Brittany and France.  
 C) Leakage of radioactive material from the Three Mile Island Nuclear reactor.  
 D) Industrial fire and disaster at Bombay High offshore drilling platform.
103. Which among the following is/are categorised as migratory birds?  
 1. Arctic Tern.                              2. Red-vented Bulbul.  
 3. King fisher.                                4. Siberian crane.  
 A) 1 and 2                      B) 1 and 4                      C) 2 and 4                      D) 1 only

104. Which among the following is not a function of ghrelin?
- Promoting the assimilation of fat.
  - Preventing the assimilation of fat.
  - Lowering the utilisation of fat.
  - Increasing appetite.
105. In the human digestive system, tri-glyceride fats are digested and broken down to
- A mixture of fatty acids, mono- and di-glycerides, some undigested triglycerides and glycerol.
  - A mixture of fatty acids, mono- and di-glycerides, undigested triglycerides and glucose.
  - A mixture of fatty acids, mono- and di-glycerides, and some undigested triglycerides.
  - A mixture of fatty acids, mono- and di-glycerides, some undigested triglycerides and cholesterol
106. Statement 1: Orientation and movement of an animal towards the direction of an external stimulus is known as taxis while orienting and movement at an angle to the stimulus is called menotaxis.
- Statement 2: Mnemotaxis is seen in animals that orient themselves by memorising their surroundings while tropotaxis is seen in animals with paired receptors that track a particular stimulus.
- Statement 3: Menotaxis is seen in honey bees and moths which use the position of the source of light as the orienting stimulus, while mnemotaxis is seen in wasps.
- Statement 1 and 3 are correct
  - Statement 1 alone is correct
  - Statements 1 and 2 are correct
  - All the statements are correct.
107. In Bohr effect:
- Higher pH increases the affinity of haemoglobin to oxygen.
  - Lower pH reduces the affinity of haemoglobin to oxygen.
  - Increase in partial pressure of CO<sub>2</sub> reduces the affinity of haemoglobin to oxygen.
  - Reduction in partial pressure of CO<sub>2</sub> reduces the affinity of haemoglobin to oxygen.
- All statements are correct.
  - Statements 1 and 2 are correct.
  - Statements 1, 2 and 3 are correct
  - Statements 1, 2 and 4 are correct.
108. Acetyl choline esterase is involved in:
- Digestion of fatty acids
  - Normal functioning of the Krebs's cycle
  - Normal functioning of the nervous system
  - Beta-oxidation of fatty acids

109. A disease that affects Schwann cells is:  
 A) Alzheimer's disease                      B) Hansen's disease  
 C) Down's syndrome                          D) Crohn's disease
110. Effect: Insulin resistance seen in type 2 diabetes of elderly people occurs even though the pancreas produces insulin.  
 Cause:  
 1. Cross reacting auto-antibodies which bind to and neutralise insulin prevent the insulin produced by the pancreas from reaching their receptors.  
 2. The pancreas fails to produce insulin due to age related dysfunction.  
 3. Insulin receptors in target cells are either masked or down-regulated.
- A) The effect and cause 1 are correct, and the cause substantiates the effect. Causes 2 and 3 are wrong.  
 B) The effect is wrong because insulin resistance is caused due to the inability of the pancreas to produce insulin. Therefore, the cause 2 is correct, but does not substantiate the effect. Causes 1 and 3 are wrong.  
 C) The effect as well as the causes 1 and 2 is wrong, but the cause 3 is correct by itself.  
 D) The effect and cause 3 are correct and the cause substantiates the effect. Causes 1 and 2 are wrong.
111. Retinitis pigmentosa is:  
 A) An inherited genetic defect.  
 B) Impairment of vision due to the deficiency of vitamin A.  
 C) Impairment of vision due to the deficiency of vitamin B.  
 D) Impairment of vision due to abnormality in the curvature of the retina.
112. An example for adult stem cells in mammals is:  
 A) Hepatocytes                                      B) Hematopoietic stem cells  
 C) Interneurons                                    D) Glial cells
113. Chemicals that pass through the placenta and cause congenital defects are known as:  
 A) Epigenetic agents                              B) Teratogenic agents  
 C) Mutagenic agents                                D) Toxicophore
114. The Ramachandran plot gives an idea of:  
 A) Kinetics of enzyme inhibition.  
 B) Structure of the DNA.  
 C) Protein structure.  
 D) Amino acid sequences in proteins.
115. The chemi-osmotic gradient in the mitochondria facilitates:  
 A) Movement of ATP.  
 B) Movement of Hydrogen ions.  
 C) Release of Calcium ions to balance the osmotic pressure.  
 D) Oxidation of Hydrogen ions.

116. A conjugate used in ELISA technique is:  
 A) Ortho-phenylenediamine dihydrochloride  
 B) Fluorescein isothiocyanate  
 C) Horse radish peroxidase  
 D) Secondary antibody
117. The link between bacteria and diseases was established by:  
 A) Charles Darwin                      B) Edward Jenner  
 C) Louis Pasteur                        D) Robert Koch
118. Assertion: Persons with O- blood group are known as universal blood donors while persons with AB+ blood group are known as universal acceptors.  
 Reason 1. Universal donors lack blood group antigens as well as Rhesus factor.  
 Reason 2: People with O- blood group carry antibodies against blood group antigens while people with AB+ blood group do not.  
 Reason 3: People with O- blood group are called universal donors because they can donate blood many times without their health being affected.
- A) The assertion is true and all three reasons are correct.  
 B) The assertion is true and reasons 1 and 2 are correct but reason 3 is wrong.  
 C) The assertion is true and reason 3 alone is true, while reasons 1 and 2 are wrong.  
 D) The assertion is false because universal donors are people with AB+ blood group and universal acceptors are people with O- blood group. Hence the reasons do not sustain the assertion.
119. Kinesins are:  
 A) Cofactors of enzymes which engage and activate the enzyme.  
 B) Proteins that move along microtubules and are involved in the transport of cargo from the centre of the cell to its periphery.  
 C) Proteins within the endoplasmic reticulum and are involved in the transport of translated proteins.  
 D) Proteins that move along microtubules and are involved in the transport of cargo from the periphery of the cell to its centre.
120. Identify the true statement/s with respect to the Molecular clock hypothesis  
 1. Indicates the rate of evolutionary change of any specified protein over time.  
 2. Is true for all proteins.  
 3. Cannot be applied if fossil records are not available.
- A) All statements are true              B) Statements 1 and 3 are true  
 C) Statement 1 alone is true        D) Statement 3 alone is true
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