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TEST BOOKLET

Sl. No. **00160**

Subject Code : 28

Subject : Zoology

LECTURERS FOR NON-GOVT. AIDED COLLEGES OF ODISHA

Time Allowed : 3 Hours

Maximum Marks : 165

: INSTRUCTIONS TO CANDIDATES :

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET CONTAINS 24 PAGES AND DOES NOT HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET.
2. You have to enter your **Roll No.** on the Test Booklet in the Box provided alongside. **DO NOT** write anything else on the Test Booklet.

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3. The Test Booklet contains **165** questions. Each question comprises four answers. You have to select the correct answer which you want to mark (darken) on the Answer Sheet. In case, you feel that there is more than one correct answer, you should mark (darken) the answer which you consider the best. In any case choose **ONLY ONE** answer for each question. If more than one answer is darkened it will be considered as wrong.
4. You have to mark (darken) all your answers **ONLY** on the **separate OMR Answer Sheet** provided, by using **BLACK BALL POINT PEN**. You have to do rough work on the space provided in the Test Booklet only. See instruction in the Answer Sheet.
5. All questions carry equal marks, i.e. of one mark for each correct answer and each wrong answer will result in negative marking of **0.25** mark.
6. Before you proceed to mark (darken) in the Answer Sheet the answers to various questions in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per the instructions in your Admit Card.
7. After you have completed filling in all your answers on the Answer Sheet and after completion of the examination, you should hand over to the Invigilator the **Original Answer Sheet (OMR Answer Sheet)** issued to you. You are allowed to take with you the candidate's copy/second page of the Answer Sheet along with the Test Booklet after completion of the examination for your reference.

SEAL

Candidate's full signature

Invigilator's signature

RS - 10/28

(Turn over)

2018

1. The members of which of the following phylum are parasites in red blood cells of vertebrates :
 - (A) Ciliophora
 - (B) Apicomplexa
 - (C) Dinoflagellata
 - (D) Axostylata

2. What is the infectious stage of **Plasmodium sp.** which infects human ?
 - (A) Merozoites
 - (B) Trophozoites
 - (C) Sporozoites
 - (D) Gametocytes

3. What is the correct sequence of life cycle of a liver fluke ?
 - (A) Egg, redia, cercaria, metacercaria, sporocyst, miracidium, adult
 - (B) Egg, miracidium, redia, sporocyst, cercaria, metacercaria, adult
 - (C) Egg, miracidium, sporocyst, redia, cercaria, metacercaria, adult
 - (D) Egg, redia, miracidium, sporocyst, cercaria, metacercaria, adult

4. Which of the following classes of Platyhelminthes is exclusively endoparasitic ?
 - (A) Trematoda
 - (B) Cestoda
 - (C) Turbellaria
 - (D) Monogenea

5. The disease "Bilharzia" which is common in China and Middle East is caused by :
 - (A) Blood fluke Schistosoma
 - (B) Wuchereria
 - (C) Taenia saginata
 - (D) Planaria

6. The filarial parasite is transmitted by :
 - (A) Female Aedes
 - (B) Female Culex
 - (C) Male Anopheles
 - (D) Male Aedes

7. Book lungs are respiratory organs of :
 - (A) Crustaceans
 - (B) Beetles
 - (C) Arachnids
 - (D) Peripatus

8. Find the odd one out :
 - (A) Nauplius, Cypris, Zoea
 - (B) Mysis, Megalopa, Allima
 - (C) Nauplius, Cypris, Kentrogen
 - (D) Nauplius, Cypris, Trochophore

9. Identify the Incorrect statement :
 - (A) Flame cells are excretory organ of **Planaria**
 - (B) Flame cells are so named because of the flagella of the cell resemble flame
 - (C) Flame cells are aggregated to form a kidney shaped organ
 - (D) Molluscs excrete through organ of Bojanus

10. Which of the following organisms neither have notochord nor vertebral column in the adult stage ?
- (A) Cephalochordates
 (B) **Herdmania**
 (C) **Petromyzon**
 (D) **Bdellostoma**
11. Which of the following is a vertebrate organism ?
- (A) Cuttle fish
 (B) Devil fish
 (C) Globe fish
 (D) Cry fish
12. Hepatic portal system is present in all :
- (A) Amniotes only
 (B) Anamnotes
 (C) Amniotes and anamniotes
 (D) Amniotes, anamniotes and in some tunicates
13. Auricularia is the larva of :
- (A) Holothuroidea
 (B) Asteroidea
 (C) Ophiuroidea
 (D) Echinoidea
14. Bipinnaria larva is found in the development of
- (A) Star lilly
 (B) Sea cucumber
 (C) Sea star
 (D) Starfish
15. Identify the CORRECT statement :
- (A) Whales can shut down half of their brain, while the other half remain active
 (B) Whales have blubber that helps in perception of vibration during echolocation and it keep them warm
 (C) Whales have the same rate of gas exchange in lungs like human only they have much larger lungs
 (D) Whales can totally fall asleep below the water for 1 hour
16. The pneumatic bones are characteristic of :
- (A) Amphibians
 (B) Reptiles
 (C) Aves
 (D) Aquatic Mammals
17. Hallux is :
- (A) Type of feather in birds
 (B) A flightless bird
 (C) First digit of hindlimb of birds
 (D) A carnivorous bird
18. Identify the INCORRECT statement :
- (A) Birds have air sacs attached to their lungs
 (B) Birds have heterocoelous vertebrae
 (C) Some birds can fly backwards
 (D) All birds have only one ovary to reduce their weight

19. Read the statements and choose the correct series of statements :
- (1) Ichthyophis coils around their eggs to protect them
 - (2) Ichthyophis is a reptile
 - (3) Ichthyophis lives in burrow
 - (4) Foam nests are example of parental care
 - (5) Rhacophorus builds foam nests
 - (6) Parental care is not naturally selected
- (A) (1), (2), (3), (4), (5), (6)
 (B) (2), (4), (5), (6)
 (C) (1), (3), (4), (5)
 (D) (1), (2), (3), (4), (6)
20. Which group's member have both gills and lungs during their adulthood ?
- (A) Lancelets
 (B) Lungfishes
 (C) Sharks, skates, rays
 (D) Amphibian
21. A character first observed in emergence and evolution of earliest tetrapods was :
- (A) Appearance of feet with digits
 (B) Appearance of jaws
 (C) Appearance of bony vertebrate
 (D) The ability to swim like fishes
22. Which characteristic separate chordates from all other animals ?
- (A) True coelom
 (B) Blastopore which becomes anus
 (C) Post anal tail
 (D) Bilateral symmetry
23. Corals are most closely related to which group ?
- (A) Freshwater hydras
 (B) Sea anemones
 (C) Sponges
 (D) Barnacles
24. Which characteristic is shared by both cnidarians and flatworms ?
- (A) Dorsoventrally flattened bodies
 (B) Flame bulbs
 (C) Radial symmetry
 (D) A digestive system with a single opening
25. An organism that has only behavioral controls over its body temperature is the :
- (A) Green frog
 (B) Penguin
 (C) Bluefin tuna
 (D) Gray wolf
26. Hibernation and estivation are both examples of :
- (A) Acclimatization
 (B) Torpor
 (C) Evaporative cooling
 (D) Non-shivering thermogenesis

27. Extracellular compartmentalization of digestive processes is an evolutionary adaptation in many animal phyla. Which of the following phyla is correctly paired with the compartment that first evolved in that phylum ?
- (A) Mollusca - large intestine
 - (B) Arthropoda - stomach
 - (C) Annelida - complete alimentary canal
 - (D) Cnidaria - gastrovascular cavity
28. Which of the following are the only vertebrates in which blood flows directly from respiratory organs to body tissue without first returning to the heart ?
- (A) Amphibians
 - (B) Birds
 - (C) Fishes
 - (D) Reptiles
29. A person with a tidal volume of 450 mL, a vital capacity of 4,000 mL and a residual volume of 1,000 mL would have a potential total lung capacity of :
- (A) 4,000 mL
 - (B) 4,450 mL
 - (C) 5,000 mL
 - (D) 5,450 mL
30. Which features of osmoregulation is found in both marine and fresh water bony fish ?
- (A) Loss of water through the gills
 - (B) Gain of salt through the gills
 - (C) No drinking of water
 - (D) Gain of water through food
31. Birds excrete uric acid as their nitrogenous waste because uric acid :
- (A) Is readily soluble in water
 - (B) Is metabolically less expensive to synthesize than other excretory products
 - (C) Requires little water for nitrogenous waste disposal which is conducive to the function of flight in terms of weight
 - (D) Excretion allows birds to live in desert environments
32. Which structure increases the reabsorption of Na^+ when stimulated by aldosterone ?
- (A) Loop of Henle
 - (B) Bowman's capsule
 - (C) Proximal tubule
 - (D) Distal tubules
33. The heartworms that can accumulate within the hearts of dogs and other mammals have a pseudocoelom, an alimentary canal, and an outer covering that is occasionally shed. To which phylum does the heartworm belong ?
- (A) Platyhelminthes
 - (B) Nematoda
 - (C) Acoela
 - (D) Annelida

34. How many unique gametes could be produced through independent assortment by an individual with the genotype **AaBbCCDdEE** ?
- (A) 4
(B) 8
(C) 16
(D) 32
35. When crossing an organism that is homozygous recessive for a single trait with a heterozygote, what is the chance of producing an offspring with the homozygous recessive phenotype ?
- (A) 0%
(B) 25%
(C) 50%
(D) 75%
36. A particular triplet of bases in the template strand of DNA is 5' AGT 3'. The corresponding codon for the mRNA transcribed is :
- (A) 3' UCA 5'
(B) 3' UGA 5'
(C) 5' TCA 3'
(D) 3' ACU 5'
37. Transcription in eukaryotes requires which of the following in addition to RNA polymerase ?
- (A) The protein product of the promoter
(B) Start and stop condons
(C) Ribosomes and tRNA
(D) Several transcription factors (TFs)
38. The lactose operon is likely to be transcribed when :
- (A) There is more glucose in the cell than lactose
(B) The cyclic AMP levels are low
(C) There is glucose but no lactose in the cell
(D) The cyclic AMP and lactose levels are both high within the cell
39. Penicillin is an antibiotic that inhibits enzymes from catalyzing the synthesis of peptidoglycan, so which prokaryotes should be most vulnerable to inhibition of penicillin ?
- (A) Mycoplasmas
(B) Gram-positive bacteria
(C) Gram-negative bacteria
(D) Endospore-bearing bacteria
40. Which of the following is an important source of endotoxin in gram-negative species ?
- (A) Endospore
(B) Sex pilus
(C) Flagellum
(D) Cell wall
41. Which of the following statements is **not** true ?
- (A) Archaea and bacteria have different membrane lipids
(B) Both archaea and bacteria generally lack membrane-enclosed organelles
(C) The cell walls of archaea lack peptidoglycan
(D) Only bacteria have histones associated with DNA

42. A features common to all trans-membrane proteins is :
- (A) A phosphorylated exterior domain
 - (B) A structure consisting Beta-sheets
 - (C) An amino acid sequence rich in acidic residues
 - (D) An alpha helical region of about 20 to 25 hydrophobic amino acids
43. A protein that has not been synthesized by membrane free ribosomes in cytosol :
- (P) Most likely synthesized in smooth endoplasmic reticulum
 - (Q) Most likely synthesized by ribosomes attached with rough endoplasmic reticulum
 - (R) Enters through the trans face of endoplasmic reticulum
 - (S) Enter into the Golgi complex from cis face
- (A) (P) only
 - (B) (P) and (R)
 - (C) (Q) and (S)
 - (D) (Q) and (R)
44. The p21 protein :
- (P) Is a cyclin dependent kinase inhibitor (CKI)
 - (Q) Regulate cell cycle progression at G1
 - (R) Synthesis is controlled by p53 protein
 - (S) Is a cyclin dependent kinase
- (A) (P), (Q) and (R)
 - (B) (Q), (R) and (S)
 - (C) (P), (R) and (S)
 - (D) (P), (Q), (R) and (S)
45. Most human cells are diploid with total DNA content of 2C. The DNA content increases to 4C before the onset of mitosis. At anaphase, the DNA content of each cluster will be :
- (A) 4C
 - (B) 2C
 - (C) 1C
 - (D) 3C
46. Cell cycle is controlled by :
- (P) Change in the concentration of CDKs
 - (Q) Change in the concentration of cyclins
 - (R) Change in the concentration of cyclins and CDKs
 - (S) Change in activity of CDKs
- (A) (P) and (Q)
 - (B) (Q) and (R)
 - (C) (Q) and (S)
 - (D) (Q), (R) and (S)

47. An antimicrobial agent that can be used as an antifungal drug because of its ability to bind to sterols in the membrane and change membrane fluidity is :
- Amphotericin B
 - Chloramphenicol
 - Streptomycin
 - Rifampicin
48. How are the eight human globin genes organized ?
- They are randomly distributed on the human chromosomes
 - They are present in two clusters, one on chromosome 11 and the other on chromosome 16
 - They are in single cluster on X chromosome
 - They are in four clusters, alpha, beta, gamma and delta
49. DNA helicase in *E. Coli* :
- Moves in the direction opposite of the replication fork
 - Binds with the template of the leading strand
 - Is a hexameric protein with ATPase activity
 - Catalyzes formation of primer
50. Which of the following event does not occur during pre tRNA processing ?
- 5' end cleavage by RNaseP
 - Addition of poly A site
 - Addition of CCA sequence at 3' end
 - Chemical modification of bases
51. Approximate molecular weight (KDa) of the product after translation of 390 bases mRNA will be :
- 48
 - 26
 - 39
 - 14
52. C-value paradox suggests us about :
- Collinearity between genome size complexity of organisms
 - Non-collinearity between genome size and complexity of organism
 - Dosage compensation
 - Number of chromosome
53. Which of the common to both *E. Coli* and Eukaryotic chromosomes ?
- DNA is circular
 - DNA is negatively supercoiled
 - DNA is contained in the nucleus
 - DNA is packaged into nucleosome
54. P element :
- Is a transposon
 - Has a role in hybrid dysgenesis
 - Occurs in *Drosophila melanogaster*
 - All of these are correct

55. Dosage compensation in *Drosophila* is achieved by :
- (A) Hypoactivation of both X chromosome in female
 - (B) Hyperactivation of Y chromosome in male
 - (C) Hyperactivation of maternal chromosome in female
 - (D) Hyperactivation of paternal chromosome in male
56. In bacteria, which enzyme binds single-stranded DNA, denatures double-stranded DNA and matches the single stranded DNA with complementary denatured DNA ?
- (A) RecA
 - (B) RecBCD
 - (C) UvrABC
 - (D) UvrD
57. A leader sequence in an mRNA of eukaryotes can be found :
- (A) After the 'stop' codon
 - (B) Between transcriptional start site and translational start site
 - (C) Within the first exon
 - (D) In the exon-intron boundaries
58. Which of the following statements is/are correct about leucine zipper motif ?
- (P) A DNA binding motif
 - (Q) Homodimer or heterodimer
 - (R) Present in transcription factors – Fos and Jun
 - (S) Present in steroid receptors
- (A) (P) only
 - (B) (P), (Q) and (R)
 - (C) (Q), (R) and (S)
 - (D) (P) and (S)
59. What is the chemical mechanism by which cells make polymers from monomers ?
- (A) Phosphodiester linkages
 - (B) Hydrolysis
 - (C) Dehydration reactions
 - (D) The formation of disulfide bridges between monomers
60. Which of the following is **true** of cellulose ?
- (A) It is a polymer composed of sucrose monomers
 - (B) It is a storage polysaccharide for energy in plant cells
 - (C) It is a storage polysaccharide for energy in animal cells
 - (D) It is a major structural component of plant cell walls

61. Which of the following **correctly** lists the order in which cellular components will be found in the pellet when homogenized cells are treated with increasingly rapid spins in a centrifuge ?
- (A) Ribosomes, nucleus, mitochondria
 - (B) Chloroplasts, ribosomes, vacuoles
 - (C) Nucleus, ribosomes, chloroplasts
 - (D) Nucleus, mitochondria, ribosomes
62. The liver is involved in detoxification of many poisons and drugs. Which of the following structures is primarily involved in this process and therefore abundant in liver cells ?
- (A) Rough ER
 - (B) Smooth ER
 - (C) Golgi apparatus
 - (D) Transport vesicles
63. Which of the following contains enzymes that transfer hydrogen from various substrates to oxygen ?
- (A) Lysosome
 - (B) Mitochondrion
 - (C) Golgi apparatus
 - (D) Peroxisome
64. Which of the following contain the 9 + 2 arrangement of microtubules ?
- (A) Cilia
 - (B) Centrioles
 - (C) Flagella
 - (D) (A) and (C) only
65. Which of the following factors would tend to increase membrane fluidity ?
- (A) A greater proportion of unsaturated phospholipids
 - (B) A greater proportion of saturated phospholipids
 - (C) A relatively high protein content in the membrane
 - (D) A greater proportion of relatively large glycolipids compared with lipids having smaller molecular masses
66. Chromatids are separated from each other :
- (A) The statement is true for meiosis I only
 - (B) The statement is true for meiosis II only
 - (C) The statement is true for mitosis and meiosis I
 - (D) The statement is true for mitosis and meiosis II
67. Which of the following hormone is involved in regulating the water-salt balance in the blood ?
- (A) Cortisone
 - (B) Aldosterone
 - (C) ADH
 - (D) ANH
68. In proteins, N-linked oligosaccharides are attached to :
- (A) Glutamine
 - (B) Arginine
 - (C) Asparagine
 - (D) Lysine

69. Which of the following is a correct statement about NK cell ?
- (A) They proliferate in response to antigen
 - (B) They kill target cells by phagocytosis and intracellular digestion
 - (C) They are a subset of polymorphonuclear cells
 - (D) They kill target cells in an extracellular fashion
70. Cell-mediated immune responses are :
- (A) Enhanced by depletion of complement
 - (B) Suppressed by corticosteroids
 - (C) Enhanced by depletion of T-cells
 - (D) Enhanced by depletion of macrophages
71. The internal pacemaker that sets biological rhythms :
- (A) Is located in the brain
 - (B) Is located in the heart
 - (C) Does not function in the absence of light
 - (D) Both (B) and (C)
72. Compound with systemic arterial blood, pulmonary arterial blood has a higher :
- (A) Oxygen content
 - (B) pH
 - (C) Bicarbonate ion concentration
 - (D) Hb concentration
73. Which moiety of haemoglobin molecule binds 2, 3 BPG at pH 7.00 ?
- (A) Amino terminal
 - (B) Carboxylic terminal
 - (C) Sulfhydryl group
 - (D) Alcoholic terminal
74. Most of the CO_2 that is transported in blood :
- (A) Is dissolved in the plasma
 - (B) Is bound to haemoglobin
 - (C) Is in carbonic acid
 - (D) Is in bicarbonate ion
75. The correct sequence for sperm migration after its production in testes is :
- (A) Seminiferous tubule → epididymis → vas deferens → urethra
 - (B) Urethra → vas deferens → epididymis → seminiferous tubule
 - (C) Epididymis → vas deferens → urethra → seminiferous tubule
 - (D) Seminiferous tubule → vas deferens → epididymis → urethra
76. Chorionic gonadotropin hormone, synthesized in placenta, plays an important role in the establishment and maintenance of pregnancy in :
- (A) Cows
 - (B) Humans
 - (C) Goats
 - (D) Rodents

77. The first amino acid in polypeptide chain is:
- (A) Serine
 - (B) Valine
 - (C) Methionine
 - (D) Leucine
78. Each individual antigenic determinant of the variable region of the antibody is referred to as:
- (A) Paratope
 - (B) Epitope
 - (C) Agretope
 - (D) Idiotope
79. Haptens:
- (A) Require carrier molecules to be immunogenic
 - (B) React with specific antibodies when homologous carriers are employed
 - (C) Interact with specific antibody even if the haptens are monovalent
 - (D) All of these
80. The clonal selection theory best account for:
- (A) The production of memory cell
 - (B) The mechanism whereby antigen and antibody unite
 - (C) The maturation of B-cells into plasma cell
 - (D) The specificity of the immune response
81. CD8 marker is expressed on the surface of:
- (A) Helper T cells
 - (B) Cytotoxic T cells
 - (C) Both Helper and Cytotoxic T cells
 - (D) B cells
82. Which one of the following reagents can be used to distinguish between single-stranded DNA and single-stranded RNA in solution?
- (A) Sulphuric acid
 - (B) Potassium hydroxide
 - (C) Sodium dodecyl sulphate
 - (D) Sodium deoxycholate
83. Information is coded in the nervous system by:
- (A) The duration of action potentials
 - (B) The amplitude of action potentials
 - (C) The location of action potentials in the neuron
 - (D) The frequency of action potentials
84. Specialized antigen presenting cells are:
- (A) CD4 + and CD8 + T cells
 - (B) B cells, macrophages and dendritic cells
 - (C) Neutrophils and CD4 + cells
 - (D) Natural killer cells and dendritic cells

85. Which of the following is NOT INVOLVED in the quaternary association of haemoglobin molecules ?
- (A) Disulphide bond
 - (B) Hydrogen bond
 - (C) Hydrophobic interaction
 - (D) Electrostatic interaction
86. The immunoglobulin that can be transported across the placenta to confer immunity to the foetus in mammals is :
- (A) IgG
 - (B) IgM
 - (C) IgE
 - (D) IgD
87. Ganadotropin releasing hormone is the key mediator of the reproductive processes in mammals. It is synthesized by :
- (A) Ganadotrophs
 - (B) Hypothalamus
 - (C) Medulla oblongata
 - (D) Gonads
88. Which test is commonly used to identify a reducing sugar ?
- (A) Iodine test
 - (B) Benedict's test
 - (C) Blurct test
 - (D) Emulsion test
89. Which of the following amino acid side chain is most frequently used for binding metal ion by protein molecules ?
- (A) Isoleucine
 - (B) Arginine
 - (C) Aspartic Acid
 - (D) Tryptophan
90. Which of the following is not true about cortisol ?
- (A) It decreases the circulatory lymphocytes
 - (B) It increases the circulatory eosinophils
 - (C) It decreases the production of prostaglandin
 - (D) It inhibits the production of fibroblasts
91. Number of nucleotide present in FMN is :
- (A) Two
 - (B) One
 - (C) Four
 - (D) Zero
92. The conformation of nucleotide in DNA is affected by rotation about how many bonds ?
- (A) 7
 - (B) 6
 - (C) 4
 - (D) 3
93. A nerve contains axons of different types. The velocity of action potential propagation will be :
- (A) The highest in an unmyelinated thin axon
 - (B) The highest in a thick myelinated axon
 - (C) The highest in a thin myelinated axon
 - (D) The same in all axonal types

94. The set of amino acid residues that can be phosphorylated in proteins is :
- (A) Histidine, serine, threonine
 - (B) Histidine, lysine, phenyl alanine
 - (C) Arginine, serine, tyrosine
 - (D) Tyrosine, asparagine, glutamine
95. In addition to adjuvant, generation of anti-hapten antibodies will require :
- (A) Addition of the hapten into the mice
 - (B) Injection of mixture of hapten and proteins into mice
 - (C) Injection of hapten covalently coupled with a protein into mice
 - (D) Injection of a mixture of hapten and lipid into mice
96. The carbon and nitrogen atoms in the pyrimidine ring system are derived from :
- (A) Glycine and carbamoyl phosphate
 - (B) Aspartate and glycine
 - (C) Glutamine and glycine
 - (D) Aspartate and carbomoyl phosphate
97. Which part of the brain is involved in motor control ?
- (A) Amygdala
 - (B) Prefrontal cortex
 - (C) Hippocampus
 - (D) Cerebellum
98. Which of the following occurs first during T cell activation ?
- (A) IL-2 production
 - (B) Cell surface expression of the high affinity IL-2 receptor
 - (C) Increase in cytosolic calcium
 - (D) Interferon-gamma production
99. What is reabsorbed through loop of Henle ?
- (A) Glucose
 - (B) CO₂
 - (C) Potassium
 - (D) Water
100. Sequence of taxonomic categories is :
- (A) Class-Phylum-Tribe-Order-Family-Genus-Species
 - (B) Division-Class-Family-Tribe-Order-Genus-Species
 - (C) Division-Class-Order-Family-Tribe-Genus-Species
 - (D) Phylum-Order-Class-Tribe-Family-Genus-Species
101. Phenetic classification is based on :
- (A) The ancestral lineage of existing organisms
 - (B) Observable characteristics of existing organisms
 - (C) Dendrograms based of DNA characteristics
 - (D) Sexual characteristics

102. In same geographical region, if new species evolve from a single ancestral species than speciation, known as :
- Sympatric speciation
 - Allopatric speciation
 - Parapatric speciation
 - Speciation
103. The chief merit of Bentham and Hookers classification is that :
- It is a natural system of classification of all groups of plants
 - A system based on evolutionary concept
 - It also considered the phylogenetic aspect
 - The description of taxa are based on actual examination of the specimens
104. Classical taxonomy is also termed :
- Beta taxonomy
 - Systematic
 - Descriptive taxonomy
 - Experimental taxonomy
105. The cytoplasm surrounding the mitochondria found in the middle piece of the sperm is called :
- Acrosome
 - Centrosome
 - Microsome
 - Manchette
106. Correct-sequence of cell stage in spermatogenesis :
- Spermatocytes – spermatids – spermatogonia – spermatozoa
 - Spermatogonia – spermatids – spermatocytes – spermatozoa
 - Spermatogonia – spermatocytes – spermatids – spermatozoa
 - Spermatocytes – spermatogonia – spermatids – spermatozoa
107. The nervous system, epidermis and hairs and nails are derivatives of :
- Endoderm
 - Mesoderm
 - Ectoderm
 - Chordomesoderm
108. Amphibian oocytes remain for years in the diplotene stage of meiotic prophase. Resumption of meiosis is initiated by :
- Gonadotropic hormone
 - Growth hormone
 - Oestrogen
 - Progesterone
109. The hormone Inhibin selectively inhibits :
- Luteinizing hormone
 - Follicle stimulating hormone
 - Thyroid stimulating hormone
 - Growth hormone

110. In human beings which part shows the maximum increase in weight from birth to adulthood ?
- (A) Brain
 - (B) Fat
 - (C) Muscles
 - (D) Skeleton
111. If the nerve supply to a newt limb is severed before amputation, how will this affect regeneration ?
- (A) It will have no effect, since regeneration involves growth of new muscle, bone and connective tissue
 - (B) A blastema will form but will not grow, and regeneration will fail
 - (C) Outgrowth will occur, but the identity of the limb will be lost and normal proximo-distal patterning will not occur
 - (D) No regeneration occurs, and the stump heals over, as it would in a mammal
112. Epimorphosis is regeneration through :
- (A) Repatterning of existing cells, as occurs in Hydra
 - (B) The reinitiation of division in existing cells, followed by patterning, as occurs in Hydra
 - (C) The reinitiation of division in existing cells, followed by patterning, as occurs in amphibians such as newts
 - (D) Repatterning of existing cells, as occurs in amphibians
113. Relative to the primitive streak and Henson's node, somite formation in the chick embryo occurs :
- (A) Anterior to Henson's node, after the primitive streak has retracted past that point
 - (B) Posterior to Henson's node, as cells from the lateral portions of the epiblast move in through the primitive streak to become mesoderm
 - (C) Adjacent to Henson's node, as the primitive streak migrates toward the anterior of the embryo
 - (D) Somite formation occurs simultaneously along the axis after Henson's node has fully retracted
114. Which of the following is NOT involved in left-right asymmetry of vertebrates ?
- (A) Calcium signalling
 - (B) Nodal
 - (C) Epidermal growth factor
 - (D) Sonic hedgehog

115. In animals, embryonic stem cells differ from adult stem cells in that :
- Embryonic stem cells are totipotent, and adult stem cells are pluripotent
 - Embryonic stem cells are pluripotent, and adult stem cells are totipotent
 - Embryonic stem cells have more genes than adult stem cells
 - Embryonic stem cells have fewer genes than adult stem cells
116. Kyoto protocol is an international agreement linked to :
- Persistent organic pollutants
 - Substances that deplete the ozone layer
 - Prevention of pollution of sea by oil
 - Greenhouse gas emission reduction
117. Resource partitioning would be most likely to occur between :
- Sympatric populations of species with similar ecological niches
 - Allopatric populations of species with similar ecological niches
 - Sympatric populations of a predator and its prey
 - Sympatric populations of a flowering plant and its specialized insect pollinator
118. Species selected for making conservation-related decisions, typically because protecting these species indirectly protects the many other species that make up the ecological community of its habitat, are called :
- Keystone species
 - Flagship species
 - Umbrella species
 - Indicator species
119. Which of the following is produced when electrical discharges pass through oxygen in air ?
- CFCs
 - Methane
 - Ozone
 - Lead compounds
120. Which of the following is not a secondary pollutant ?
- Ozone
 - Carbonic acid
 - Sulphuric acid
 - Carbon dioxide
121. Residence time of methane in the atmosphere is :
- 3-7 days
 - 2-3 days
 - 4-8 years
 - 2-3 years
122. Major cause of SO₂ on global scale is :
- Volcanoes
 - Electric sparks
 - Combustion
 - Exhaust fumes of motor vehicles

123. The yellow colour in photochemical smog is due to presence of :
- (A) Dinitrogen oxide
(B) Nitrogen dioxide
(C) Chlorine gas
(D) Chlorine dioxide
124. The main pollutant of leather tanneries in the waste water is :
- (A) Chromium III
(B) Chromium IV
(C) Chromium V
(D) Chromium VI
125. The region with the highest number of endemic species overall is :
- (A) Philippines
(B) Madagascar
(C) Brazil
(D) Australia
126. Induced breeding technique is used in :
- (A) Marine fishery
(B) Capture fishery
(C) Culture fishery
(D) Inland fishery
127. Who stands first in the world for pearl production ?
- (A) India
(B) China
(C) Korea
(D) Japan
128. The most valuable kind of pearl comes from marine pearl oyster of Eastern Asia, it is :
- (A) Melegrina
(B) Ostrea virginiana
(C) Pinctada
(D) Mytilus
129. What is the best explanation of "Green Chemistry" ?
- (A) Green Chemistry is the design of chemical products and processes that reduce or eliminate the use and generation of hazardous substances
(B) Green Chemistry is a research program aimed at increasing the use of petroleum for production of products other than gasoline and jet fuel
(C) Green Chemistry refers to the EPA's mandatory programs for recycling paper, glass, plastics and aluminum
(D) Green Chemistry refers to agricultural practices for growing organic vegetables without the use of pesticides
130. Identify the correct match between tiger reserve and its state :
- (A) Sanjay Dubri – Madhya Pradesh
(B) Corbett – Madhya Pradesh
(C) Bandipur – Tamil Nadu
(D) Palamau – Orissa

131. Which endangered animal is the source of the world's finest, lightest, warmest and most expensive wool – the shahtoosh ?
- (A) Nilgai
(B) Cheetal
(C) Kashmiri goat
(D) Chiru
132. All of the following act to increase species diversity except :
- (A) Competitive exclusion
(B) Patchy environments
(C) Keystone predators
(D) Migration of populations
133. Restriction endonucleases from two different organisms that recognise the same DNA sequence for cleavage are called :
- (A) Isoschizomers
(B) Neoschizomers
(C) Concatemers
(D) Pallindromes
134. Which of the following characteristics is undesirable in cloning vectors ?
- (A) Self-replicating
(B) High copy number
(C) Vulnerable at several sites to a restriction enzyme
(D) Small in size
135. The minimum components of an artificial yeast chromosome include all the following except :
- (A) All the histones except H1
(B) An autonomously replicating sequence
(C) A centromeric sequence
(D) A telomeric sequence
136. Which of the following virus is not used as gene therapy vectors ?
- (A) Retro viruses
(B) Adeno-viruses
(C) Adeno-associated viruses
(D) Polyomaviruses
137. A mixture containing two protein having similar molecular mass but different oligomeric properties can be separated by :
- (A) SDS-PAGE analysis
(B) Native PAGE analysis
(C) Isoelectric focusing
(D) Both (B) and (C)
138. The R_f values of substances A and B are 0.34 and 0.68 when chromatographed on paper. What is the ratio of distances moves after three hours, assuming that neither substance has run off the paper ?
- (A) A : B :: 2 : 1
(B) A : B :: 1 : 2
(C) A : B :: 1 : 1
(D) A : B :: 2 : 3

139. Which of the following would be the best method to separate α AT from altered α AT ?
- (A) Size-exclusion chromatography
 - (B) Ion-exchange chromatography
 - (C) Thin-layer chromatography
 - (D) Sucrose-gradient centrifugation
140. A α -helical conformation of a globular protein in solution is best determined by which of the following ?
- (A) Ultraviolet-visible absorbance spectroscopy
 - (B) Fluorescence spectroscopy
 - (C) Electron microscopy
 - (D) Circular dichroism
141. The tertiary structure of protein is detected by :
- (A) X-ray diffraction/crystallography
 - (B) Spectrophotometry
 - (C) Electrophoresis
 - (D) Chromatography
142. What is the purpose of performing a homology search with a DNA sequence ?
- (A) To determine if any genes with similar sequences are present in the DNA databases
 - (B) To determine if the sequence is already in the DNA databases
 - (C) To search for consensus exon-intron boundaries
 - (D) To determine the codon bias for a specific gene
143. A controlled experiment is one that :
- (A) Proceeds slowly enough that a scientist can make careful records of the results
 - (B) May include experimental groups and control groups tested in parallel
 - (C) Is repeated many times to make sure the results are accurate
 - (D) Keeps all environmental variables constant
144. Which of the following statements best distinguishes hypotheses from theories in science ?
- (A) Theories are hypotheses that have been proved
 - (B) Hypotheses are guesses ; theories are correct answers
 - (C) Hypotheses usually are relatively narrow in scope ; theories have broad explanatory power
 - (D) Hypotheses and theories are essentially the same thing

145. Which of the following is an example of qualitative data ?
- (A) The temperature decreased from 20°C to 15°C
 - (B) The contents of the stomach are mixed every 20 seconds
 - (C) The fish swam in a zig-zag motion
 - (D) The six pairs of robins hatched an average of three chicks
146. The fact that plants can be cloned from somatic cells demonstrates that :
- (A) Differentiated cells retain all the genes of the zygote
 - (B) Genes are lost during differentiation
 - (C) The differentiated state is normally very unstable
 - (D) Differentiated cells contain masked mRNA
147. A student wishes to clone a sequence of DNA of 200 kb. Which vector be appropriate ?
- (A) A plasmid
 - (B) A typical bacteriophage
 - (C) a BAC
 - (D) A plant virus
148. Which describes the transfer of polypeptide sequences to a membrane to analyse gene expression ?
- (A) Southern blotting
 - (B) Northern blotting
 - (C) Western blotting
 - (D) Eastern blotting
149. Sow bugs become more active in dry areas and less active in humid areas. This is an example of :
- (A) Taxis
 - (B) Tropism
 - (C) Kinesis
 - (D) Cognition
150. Every morning at the same time, John went into the den to feed his new tropical fish. After a few weeks, he noticed that the fish swam to the top of the tank when he entered the room. This is an example of :
- (A) Habituation
 - (B) Imprinting
 - (C) Classical conditioning
 - (D) Operant conditioning
151. The integration of T-DNA in the plant nuclear genome is most likely due to :
- (A) Homologous recombination
 - (B) Non-homologous recombination
 - (C) Non-homologous end joining
 - (D) Single-stranded recombination during transcription

152. When the gene and the promoter used for modification of a plant using transformation technology are derived from sexually compatible species, the modified plant thus generated is known as a :
- Cisgenic plant
 - Selfgenic plant
 - Intragenic plant
 - Hemilogous plant
153. Which one of the following reporter genes can be used for real-time visualization of living cells/tissues in transgenic plants ?
- Gus
 - Gfp
 - Cat
 - Beta-galactosidase
154. Which one of the following is a frequently used radio-opaque dye ?
- Barium chloride
 - Barium sulphate
 - Barium nitrite
 - Barium iodide
155. Circadian rhythms are controlled by :
- Medulla
 - Pituitary gland
 - Cortex
 - Suprachiasmatic nucleus
156. N-terminal amino acids are usually determined by Sanger's method using :
- Ninhydrin reagent
 - 2,4 dinitrobenzene
 - Hydrazine
 - Concentrated Nitric acid
157. A technique for defining gene arrangement in very long stretches of DNA (50-100Kb) is :
- RFLP
 - Chromosome walking
 - Nick translation
 - Southern blotting
158. The best way to demonstrate whether nuclear DNA is being replicated in a cell is by :
- Phase-contrast Microscopy
 - Thin layer Chromatography
 - Gel Electrophoresis
 - Autoradiography
159. Which microbe has been used against insect plant pathogen ?
- Agrobacterium tumefaciens**
 - Agrobacterium rhizogenes**
 - Bacillus thuringiensis**
 - Fusarium nudum**

160. Scientists developed a set of guidelines to address the safety of DNA technology. Which of the following is one of the adopted safety measures ?
- (A) Microorganisms used in recombinant DNA experiments are genetically crippled to ensure that they cannot survive outside of the laboratory
 - (B) Genetically modified organisms are not allowed to be part of our food supply
 - (C) Transgenic plants are engineered so that the plant genes cannot hybridize
 - (D) Experiments involving HIV or other potentially dangerous viruses have been banned
161. What is bioinformatics ?
- (A) A technique using 3D images of genes in order to predict how and when they will be expressed
 - (B) A method that uses very large national and international databases to access and work with sequence information
 - (C) A software program available from NIH to design genes
 - (D) A series of search programs that allow a student to identify who in the world is trying to sequence a given species
162. Antiviral drugs that have become useful are usually associated with which of the following properties ?
- (A) Ability to remove all viruses from the infected host
 - (B) Interference with the viral reproduction
 - (C) Prevention of the host from becoming infected
 - (D) Removal of viral proteins
163. An optical density 1 means :
- (A) 1% of the incident light is absorbed
 - (B) 1% of the incident light is transmitted
 - (C) 90% of the incident light is absorbed
 - (D) 90% of the incident light is transmitted
164. Radioactive iodine can be incorporated into :
- (A) Serine
 - (B) Threonine
 - (C) Tyrosine
 - (D) Neucine
165. Transcription initiation site can be determined by :
- (A) Footprinting
 - (B) Northern blotting
 - (C) Primer extension
 - (D) Nick translation



SPACE FOR ROUGH WORK

SEAL