

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

Subject Code No. : **48**

Sl. No. : **1186**

TEST BOOKLET
LECTURERS IN NON-GOVERNMENT
AIDED COLLEGES
ZOOLOGY

Time Allowed : 2 Hours

Maximum Marks : 100

: INSTRUCTIONS TO CANDIDATES :

1. IMMEDIATELY AFTER THE COMMENCEMENT OF THE EXAMINATION, YOU SHOULD CHECK THAT THIS TEST BOOKLET **DOES NOT** HAVE ANY UNPRINTED OR TORN OR MISSING PAGES OR ITEMS ETC. IF SO, GET IT REPLACED BY A COMPLETE TEST BOOKLET OF THE SAME SERIES ISSUED TO YOU.
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.

--	--	--	--	--	--	--	--
3. This Test Booklet contains **100** items (questions). Each item (question) comprises four responses (answers). You have to select the correct response (answer) which you want to mark (darken) on the Answer Sheet. In case, you feel that there is more than one correct response (answer), you should mark (darken) the response (answer) which you consider the best. In any case, choose **ONLY ONE** response (answer) for each item (question). If more than one response is darkened it will be considered as wrong answer.
4. You have to mark (darken) all your responses (answers) **ONLY** on the **separate Answer Sheet** provided, by using **BALL POINT PEN (BLACK)**. See instructions in the Answer Sheet.
5. All items (questions) carry equal marks. All items (questions) are compulsory. Each wrong response will result in negative marking of **0.25** mark.
6. Before you proceed to mark (darken) in the Answer Sheet the responses to various items (questions) in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per the instructions in your **Admission Certificate**.
7. After you have completed filling in all your responses (answers) on the Answer Sheet and after conclusion of the examination, you should hand over to the Invigilator the *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

CO – 28/10

2016

(Turn over)

1. Spectrin of erythrocytes and cytochrome-c of mitochondria are examples of :
 - (A) Extrinsic protein
 - (B) Intrinsic protein
 - (C) Tunnel protein
 - (D) Cytoplasmic protein

2. Intermediate filaments are made up of :
 - (A) Non-contractile proteins
 - (B) β -tubulin
 - (C) Myosin
 - (D) Actin

3. Among the following which is not present in smaller subunit of ribosome ?
 - (A) Peptidyl transferase
 - (B) Binding site for t RNA
 - (C) A site
 - (D) P site

4. In leaf-cutter ants, division of labor among workers is related to the :
 - (A) Worker's sex
 - (B) Number of workers
 - (C) Worker's size
 - (D) All of the above

5. Unlike prokaryotic DNA replication, eukaryotic DNA replication :
 - (A) Is completed by DNA polymerase
 - (B) Cannot be completed by DNA polymerase
 - (C) Is semi-conservative
 - (D) Has a multiple origin

6. Using the molecular record to determine phylogenetic relationships is based on the assumption that :
 - (A) Nucleotide sequences do not change over time
 - (B) Nucleotide sequences change at a fairly constant rate over time
 - (C) Nucleotide sequences change randomly and erratically over time
 - (D) Evolutionary changes occur in phenotypes but not in genotypes

7. Molecular chaperones :
 - (A) Are found in the nucleus and aid in folding of DNA
 - (B) Degrade proteins that have folded incorrectly
 - (C) Help new proteins fold correctly and repair incorrectly folded proteins
 - (D) Are only present in cells that are exposed to high temperatures

8. The electron donor during nitrogen fixation is :
- (A) Water
 - (B) Ferrocyanide
 - (C) Ferredoxin
 - (D) CO₂
9. Fighting over shared resources is called :
- (A) Character displacement
 - (B) Competitive exclusion
 - (C) Exploitative competition
 - (D) Interference competition
10. Which of the following is correct with regard to aneuploidy ?
- (A) Inversion
 - (B) $2n + 1$
 - (C) All aneuploid individuals die before birth
 - (D) $4n$
11. In prokaryotes where the mitochondria is absent, the site of oxidative phosphorylation and electron transport chain including dehydrogenases is :
- (A) Mesosomes
 - (B) Endosomes
 - (C) Plasma membrane
 - (D) Microsomes
12. Holiday junction is observed during :
- (A) Mitosis
 - (B) Interphase
 - (C) Recombination
 - (D) DNA Repair
13. Which of the following is not a type of epithelial cell ?
- (A) Cuboidal cells
 - (B) Mast cells
 - (C) Squamous cells
 - (D) Columnar cells
14. A month sex attractant would be a _____.
- (A) Hormone
 - (B) Neurotransmitter
 - (C) Steroid
 - (D) Pheromone
15. During some types of antibiotic treatments, patients often experience diarrhoea because :
- (A) Antibiotics are toxic to the colon's epithelium as well as to bacteria
 - (B) The bacterial flora of the large intestine digest fibre, which otherwise would create osmotic pressure and result in decreased water reabsorption
 - (C) Antibiotics interfere with the vitamin absorption process normally occurring within the large intestine
 - (D) After intestinal bacteria have been killed, an unusually large amount of water is reabsorbed

16. What is the probability that a male will inherit an X-linked recessive gene from his father ?
- (A) 0
 (B) 25 percent
 (C) 50 percent
 (D) 75 percent
17. A protein having both structural and enzymatic traits is :
- (A) Myosin
 (B) Collagen
 (C) Trypsin
 (D) Actin
18. Calcium plays an important role in _____.
- (A) Neural conduction
 (B) Muscle contraction
 (C) Blood clotting
 (D) All of the above
19. A heritable feature is a _____ and may have two or more variants called _____.
- (A) Trait / characteristics
 (B) Character / traits
 (C) Character / factors
 (D) Trait / factors
20. The genetic disease cystic fibrosis is caused by a defective allele that :
- (A) Produces a dysfunctional enzyme that fails to breakdown brain lipids
 (B) Causes hemoglobin molecules to collapse
 (C) Produces a defective chlorine-channel membrane transport protein
 (D) Produces a neurotoxin
21. Huntington's disorder is due to an autosomal dominant allele. If a heterozygous male marries a normal female, what percentage of the offspring will have Huntington's ?
- (A) 25%
 (B) 100%
 (C) 0%
 (D) 50%
22. If insufficient PTH is produced, the blood calcium level drops, resulting in _____.
- (A) Reduced growth in childhood or parathyroid dwarfism
 (B) Tetany, where the body shakes from continuous muscle contraction
 (C) Osteoporosis
 (D) Exophthalmic goiter

23. The cardiac sphincter surrounds the cardiac orifice. If this sphincter failed to properly constrict, there might be a problem with :
- Regurgitation of food into the esophagus
 - Movement of the bolus into the trachea rather than the esophagus
 - Rapid emptying from the stomach to the small intestine
 - Rapid emptying from the small intestine to the large intestine
24. The change in coloration of the peppered moth is an example of :
- A population with disruptive selection
 - A population with directional selection
 - A population with stabilizing selection
 - A population with no selection
25. Character displacement is associated with :
- Sympatric species
 - Allopatric species
 - Island biogeography
 - Secondary succession
26. The structure formed where two adjacent membrane are thickened with disc shaped adhesive material in between and tonofibrils radiating out from adhesive region is :
- Gap junction
 - Tight junctions
 - Desmosomes
 - Plasmodesmata
27. Chargaff found that for DNA :
- The ratio of A to C is closed to 1 : 1 and the ratio of G to T is closed to 1 : 1
 - The ratio of A to T is closed to 1 : 1 and the ratio of G to C is closed to 1 : 1
 - The ratio of A to G is close to 1 : 1 and the ratio of T to C is close to 1 : 1
 - $A + T = G + C$
28. The poisonous "red tides" result from blooms of :
- Diatoms
 - Dinoflagellates
 - Red algae
 - Foraminifera
29. In India most of plant flowers during spring or summer because :
- It is breeding season for butterflies
 - More solar radiation are available
 - Fruit and seed setting must be completed before onset of monsoon
 - Environmental fluctuations are low

30. A new species can arise in a single generation :
- (A) Through geographical isolation
 - (B) In a very large population that is spread over a large area
 - (C) If a change in chromosome number creates a reproductive barrier
 - (D) If allopatric speciation occurs
31. In conjugation of the ciliate, paramecium, _____ are exchanged.
- (A) Macronuclei
 - (B) Heterocysts
 - (C) Zoogonia
 - (D) Micronuclei
32. Malaria results from a mosquito injecting the _____ of plasmodium into the human blood stream.
- (A) Sporocyst
 - (B) Merozoites
 - (C) Gametocytes
 - (D) Sporozoites
33. In bone formation, chondrocytes die because of :
- (A) Regression of capillaries
 - (B) Impregnation of the matrix by a fatty substance
 - (C) Shrinkage of the lacunae
 - (D) Calcification
34. The change in coloration of the peppered moth is an example of :
- (A) A population with disruptive selection
 - (B) A population with directional selection
 - (C) A population with stabilizing selection
 - (D) A population with no selection
35. Eusocial animals :
- (A) Exhibit sexual selection
 - (B) Live in colonies with many fertile females
 - (C) Exhibit territoriality within the colony
 - (D) Exhibit kin selection
36. Which of the following helps a prey species advertise to predators that it is unpalatable ?
- (A) Beltian bodies
 - (B) Primary compounds
 - (C) Aposematic coloration
 - (D) Cryptic coloration

37. Human males are much more likely to be have hemophilia (a failure of blood to clot properly) than human females. This is the case because :
- (A) Hemophilia is a contagious disease to which males are more susceptible
 - (B) The gene for hemophilia is carried on the Y chromosome
 - (C) Hemophilia is carried on the autosomes
 - (D) The gene for hemophilia is sex-linked
38. How many map units is a recombination frequency of 5 percent equal to ?
- (A) 2.5 centimorgans
 - (B) 10 centimorgans
 - (C) 5 centisturtevents
 - (D) 5 centimorgans
39. Each cell in an individual with Down syndrome contains _____ chromosomes.
- (A) 47
 - (B) 22
 - (C) 24
 - (D) 45
40. Producing a vaccine against the tsetse fly-borne trypanosomes is very difficult because :
- (A) Tsetse flies are hard to grow in captivity
 - (B) Trypanosomes each have over a thousand genes for antigens but express only one at a time
 - (C) The disease is only expressed in humans and experimental subjects are hard to get
 - (D) The trypanosome does not cause an antibody response
41. Protein folding is mainly driven by all of the following except :
- (A) Hydrophobic interactions
 - (B) Hydrogen bonds
 - (C) Covalent bonds
 - (D) Electrostatic attractions
42. Dosage compensation in case of human is achieved by :
- (A) Hyper activation of X chromosome
 - (B) Hyper activation of Y chromosome
 - (C) Heterochromatization of X chromosome
 - (D) Heterochromatization of Y chromosome

43. The gradual mode of speciation in single lineage in which species diverge in spurts of relatively rapid change which result in increase in species is termed as :
- (A) Punctuated equilibrium
 - (B) Adaptive radiation
 - (C) Anagenesis
 - (D) Cladogenesis
44. The major reservoir for phosphorus is :
- (A) Aquifers
 - (B) Soil and rocks
 - (C) The atmosphere
 - (D) Clouds
45. The total amount of energy that is converted to organic compounds in a given area per unit of time is called the :
- (A) Biomass
 - (B) Net primary productivity
 - (C) Gross primary productivity
 - (D) Consumer rate
46. When isolated liver cells are combined with nonpolar toxins initial processing in the _____ increases the solubility of these compounds as an initial step in their excretion.
- (A) Smooth ER
 - (B) Golgi apparatus
 - (C) Mitochondrion
 - (D) Rough ER
47. Sister worker ants have _____ % of their genes in common.
- (A) 30
 - (B) 60
 - (C) 75
 - (D) 90
48. Progression through the eukaryotic cell cycle is regulated by :
- (A) Microtubules
 - (B) The p53 gene
 - (C) Cyclin-dependent kinases
 - (D) DNA ligase
49. Learning is a durable change in behaviour as a result of _____.
- (A) Instinct
 - (B) Experience
 - (C) Imprinting
 - (D) Altruism
50. The earth is an open system with respect to :
- (A) Organisms
 - (B) Chemicals
 - (C) Energy
 - (D) All of the above

51. In a salt marsh, the meiofauna :
- (A) Are represented by crabs and lobsters
 - (B) Include fish
 - (C) Are very small animals that live between the sand grains
 - (D) Are the algae
52. What is the single most important factor contributing to losing or creating endangered species ?
- (A) Air pollution
 - (B) Clearcut logging
 - (C) Habitat loss
 - (D) Water pollution
53. This type of biome (habitat) has very long cold winters, short warm summers and typically has acidic soils as a result of the cold temperatures and litter fall :
- (A) Desert
 - (B) Tundra
 - (C) Taiga (Coniferous forests)
 - (D) Temperate forests
54. Which of them do not cause variation at genetic level ?
- (A) Mutation and recombination
 - (B) Gene migration and drift
 - (C) Natural selection and artificial selection
 - (D) Panmictic population
55. Which of the following lists contains a locomotor mechanism not possessed by protists ?
- (A) Pseudopodia, cilia and flagella
 - (B) Flagella, axopodia and pseudopodia
 - (C) Flagella, pseudopodia and tube feet
 - (D) Cilia and pseudopodia
56. Hypothalamic releasing and release-inhibiting hormones are transported from the hypothalamus to the anterior pituitary by way of _____.
- (A) The general blood stream
 - (B) A portal system of blood vessels directly connecting the two organs
 - (C) Direct contact between the two organs
 - (D) A cascade of release-inhibit-release-etc. interactions

57. The receptors for non-steroid peptide hormones are on the _____.
- (A) Plasma membrane
 (B) Nuclear envelope
 (C) DNA receptor complex
 (D) Peptide chain
58. The epithelium lining the inner surface of the digestive tract is formed from :
- (A) Ectoderm
 (B) Mesoderm
 (C) Endoderm
 (D) All of the above
59. Which of the following is not a part of the lymphatic / immune system ?
- (A) Spleen
 (B) Thymus
 (C) Tonsil
 (D) Pancreas
60. The evolution of two interacting species in a community is referred to as _____.
- (A) Population pressure
 (B) Carrying capacity
 (C) Co-evolution
 (D) Allopatric speciation
61. A particular allele can have different effects if it was inherited from a male rather than a female. This phenomenon is known as :
- (A) Extranuclear inheritance
 (B) Aneuploidy
 (C) Sex-linkage
 (D) Genome imprinting
62. Which sex should show mate choice ?
- (A) Always males
 (B) Always females
 (C) The sex having higher parental investment
 (D) The sex having lower parental investment
63. Which of the following statements about territoriality is true ?
- (A) Territoriality is always beneficial to the animal
 (B) Territories frequently overlap in time or space
 (C) Territories rarely contain any resources
 (D) None of the above are true
64. The liver is formed from :
- (A) Nerve tissue
 (B) Epithelial tissue
 (C) Connective tissue
 (D) Muscle tissue

65. Calcitonin _____.
- (A) Regulates the calcium level in blood
 - (B) Is balanced by the action of parathyroid hormone
 - (C) Increases the deposit of calcium in bone
 - (D) All of the above
66. During crossing over, exchange of genetic material takes place between :
- (A) Two chromatids
 - (B) Two chromosomes
 - (C) The non-sister chromatids of the paired chromosomes
 - (D) Two sister chromatids of each homologue
67. Birds with average-sized wings survived a severe storm more successfully than other birds in the same population with longer or shorter wings. This illustrates :
- (A) The founder effect
 - (B) Stabilizing selection
 - (C) Artificial selection
 - (D) Gene flow
68. When is it possible for a population growth rate to be less than zero ?
- (A) When the death rate is greater than the birth rate
 - (B) The population growth rate can never be less than zero
 - (C) When the birth rate is equal to the death rate
 - (D) When the birth rate is greater than the death rate
69. When a red deer stag or male songbird defends a certain area, he is showing _____.
- (A) Imprinting level
 - (B) Fixed action pattern
 - (C) Territoriality
 - (D) Dominance hierarchy
70. During a secondary immune response :
- (A) Selected B generate antibody-producing effector B cells called plasma cells
 - (B) The stricken individual may become ill
 - (C) About 10 to 17 days are required from exposure to maximum effector response
 - (D) The generation of effector cells begins with memory cells produced during the primary immune response

71. Which is the correct order from least to most complex ?
- (A) Glucuronate, hyaluronate, proteoglycans, GAG chains
 - (B) Hyaluronate, glucuronate, GAG chains, proteoglycans
 - (C) GAG chains, hyaluronate, glucuronate, proteoglycans
 - (D) Glucuronate, hyaluronate, GAG chains, proteoglycans
72. The reason urine does not seep out of the bladder is due to the role of :
- (A) Adherens junctions
 - (B) Hemidesmosomes
 - (C) Gap junctions
 - (D) Tight junctions
73. Which of the following drugs would seem to have the most promise as a drug for inhibiting transplant rejection ?
- (A) Compound KL98 : acts like histamine
 - (B) Compound HY52 : suppresses cytotoxic T cells
 - (C) Compound IZ74 : a potent allergen
 - (D) Compound OX63 : stimulates helper T cells
74. A critical breakthrough that made automated PCR possible was _____.
- (A) The discovery that bacteria did not use codons
 - (B) A method to convert exons into introns
 - (C) The discovery of a temperature-insensitive stable DNA polymerase in a hot springs bacterium
 - (D) The use of atomic energy to produce the chain reaction
75. All crustaceans have a unique kind of larva called a :
- (A) Naid
 - (B) Naupilus
 - (C) Planula
 - (D) Nymph
76. The major impediment to large size in arthropods is :
- (A) The poor respiratory system
 - (B) The inadequate nervous system
 - (C) The inability of their excretory system to conserve water
 - (D) The weight of a sufficiently strong exoskeleton

77. A _____ is used to introduce recombinant DNA into cells.
- (A) Clone
 - (B) PCR machine
 - (C) Probe
 - (D) Vector
78. In a series of immune system experiments, the thymus glands were removed from baby mice. Which of the following would you predict as a likely result ?
- (A) The mice suffered from numerous allergies
 - (B) The mice never developed cancerous tumors
 - (C) The mice suffered from autoimmune diseases
 - (D) The mice readily accepted tissue transplants
79. Tissues are typed before an organ transplant to make sure that the _____ of donor and recipient match as closely as possible.
- (A) T-cells
 - (B) Antibodies
 - (C) MHC (Major Histocompatibility Complex) proteins
 - (D) Histamines
80. The simple eyes of insects are :
- (A) Ocelli
 - (B) Apposition eyes
 - (C) Rhabdoms
 - (D) Ommatidia
81. Which of the following insect structures is not homologous to the others listed ?
- (A) Wings
 - (B) Antennae
 - (C) Mandibles
 - (D) Chelicerae
82. 4-Hydroxylation of specific prolyl residues during collagen synthesis requires all of the following except :
- (A) Fe²⁺
 - (B) A specific amino acid sequence
 - (C) Ascorbic acid
 - (D) Succinate
83. In all enzymes the active site :
- (A) Contains the substrate-binding site
 - (B) Is contiguous with the substrate-binding site in the primary sequence
 - (C) Contains a metal ion as a prosthetic group
 - (D) Contains the amino acid side chains involved in catalyzing the reaction

84. Structural features that are common to all prostaglandins include :
- 20-carbon atoms
 - An oxygen-containing internal heterocyclic ring
 - A peroxide group at C-15
 - Two double bonds
85. The liquid part of blood after the fibrinogen is removed is :
- Plasma
 - Lymph
 - Serum
 - Puss
86. The RNA in the cell with the greatest sequence diversity is :
- Messenger RNA
 - Ribosomal RNA
 - Transfer RNA
 - Both (A) and (C)
87. The heartbeat begins with the depolarization of the :
- Atrioventricular node
 - Bundle of His
 - Sinoatrial node
 - Purkinje fibers
88. A linkage group corresponds to a :
- Chromosome
 - Set of independently assorting genes
 - Set of independently segregating alleles
 - Set of non-complementing alleles
89. Atria contract :
- Just before diastole
 - During diastole
 - Right after the systole
 - During the systole
90. The tissue layer common to all blood vessels is the :
- Circular smooth muscle
 - Endothelium
 - Longitudinal striated muscle
 - Connective tissue
91. If parents have AB and O blood group, their offspring could be of :
- O group only
 - A & B group
 - A, B, O group
 - A, B, O and AB group
92. Similar set of regulatory genes control development in Arabidopsis, Drosophila and Mice. These genes are called :
- Homologous
 - Heterologous
 - Homeotic
 - Orthologous
93. If total concentration of A = T is 56%, what will be the concentration of cytosine in genome ?
- 56
 - 23
 - 44
 - 22

94. Which of the following is the most muscular chamber in a bird's heart or a mammal's heart ?
- (A) The right atrium
(B) The left atrium
(C) The left ventricle
(D) The right ventricle
95. Lectotype is :
- (A) Duplicate of holotype
(B) Specimen described along with holotype
(C) Specimen cited by author without making one holotype
(D) Specimen selected from original material for nomenclature type when there is no holotype
96. Extinction rate is high at :
- (A) Main lands
(B) Large islands
(C) Small islands near main lands
(D) Small island far from main lands
97. Among the following, which is NOT an endangered animal ?
- (A) Asiatic Lion (*Panthera leo persica*)
(B) Asiatic Tiger (*Panthera tigris*)
(C) Indian wild ass (*Equus hemionus khur*)
(D) Rhesus monkey (*Maccaca mulatta*)
98. In which type of heart is there mixing of oxygenated and deoxygenated blood ?
- (A) Fish
(B) Frog
(C) Crocodile
(D) All of the above
99. Species that have a disproportionately large impact on the maintenance of an ecosystems biodiversity are referred to as :
- (A) Exotics
(B) Primary producer
(C) Archaea
(D) Keystone species
100. Biodiversity hot spots are mainly located :
- (A) At equator
(B) In temperate regions
(C) Between tropics
(D) In arctic region

.....

SPACE FOR ROUGH WORK

94. Which of the following is a vertebrate? (A) The right atrium (B) The left atrium (C) The right ventricle (D) The left ventricle
95. Which of the following is a vertebrate? (A) Fish (B) Frog (C) Salamander (D) All of the above
96. Which of the following is a vertebrate? (A) Snake (B) Lizard (C) Tortoise (D) All of the above
97. Which of the following is a vertebrate? (A) Snake (B) Lizard (C) Tortoise (D) All of the above
98. Which of the following is a vertebrate? (A) Snake (B) Lizard (C) Tortoise (D) All of the above
99. Which of the following is a vertebrate? (A) Snake (B) Lizard (C) Tortoise (D) All of the above
100. Which of the following is a vertebrate? (A) Snake (B) Lizard (C) Tortoise (D) All of the above
101. Which of the following is a vertebrate? (A) Snake (B) Lizard (C) Tortoise (D) All of the above
102. Which of the following is a vertebrate? (A) Snake (B) Lizard (C) Tortoise (D) All of the above
103. Which of the following is a vertebrate? (A) Snake (B) Lizard (C) Tortoise (D) All of the above
104. Which of the following is a vertebrate? (A) Snake (B) Lizard (C) Tortoise (D) All of the above
105. Which of the following is a vertebrate? (A) Snake (B) Lizard (C) Tortoise (D) All of the above
106. Which of the following is a vertebrate? (A) Snake (B) Lizard (C) Tortoise (D) All of the above
107. Which of the following is a vertebrate? (A) Snake (B) Lizard (C) Tortoise (D) All of the above
108. Which of the following is a vertebrate? (A) Snake (B) Lizard (C) Tortoise (D) All of the above
109. Which of the following is a vertebrate? (A) Snake (B) Lizard (C) Tortoise (D) All of the above
110. Which of the following is a vertebrate? (A) Snake (B) Lizard (C) Tortoise (D) All of the above

OFFICIAL