

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

Test Booklet Series

T. B. C. : PGT – 4/20

**A**

**TEST BOOKLET**

**PART – B  
(ZOOLOGY)**

**40225**

Sl. No.

**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. ENCODE CLEARLY THE TEST BOOKLET SERIES **A, B, C** OR **D**, AS THE CASE MAY BE, IN THE APPROPRIATE PLACE IN THE ANSWER SHEET USING BALL POINT PEN (BLUE OR BLACK).
3. 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.
4. **YOU ARE REQUIRED TO FILL UP & DARKEN ROLL NO., TEST BOOKLET / QUESTION BOOKLET SERIES IN THE ANSWER SHEET AS WELL AS FILL UP TEST BOOKLET / QUESTION BOOKLET SERIES AND SERIAL NO. AND ANSWER SHEET SERIAL NO. IN THE ATTENDANCE SHEET CAREFULLY. WRONGLY FILLED UP ANSWER SHEETS ARE LIABLE FOR REJECTION AT THE RISK OF THE CANDIDATE.**
5. 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).
6. You have to mark (darken) all your responses (answers) **ONLY** on the **separate Answer Sheet** provided, by using **BALL POINT PEN (BLUE OR BLACK)**. See instructions in the Answer Sheet.
7. All items (questions) carry equal marks. All items (questions) are compulsory. Your total marks will depend only on the number of correct responses (answers) marked by you in the Answer Sheet. There will be no negative marking for wrong answer.
8. Before you proceed to mark (darken) in the Answer Sheet the responses (answers) to various items (questions) in the Test Booklet, you have to fill in some particulars in the Answer Sheet as per the instructions sent to you with your **Admission Certificate**.
9. 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.
10. Sheets for rough work are appended in the Test Booklet at the end.

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1. Which of the following phyla have nephridia as an excretory structure ?
  - (A) Arthropods
  - (B) Annelids
  - (C) Platyhelminthes
  - (D) Ctenophora
2. Which larval form has apical tuft of cilia ?
  - (A) Bipinnaria
  - (B) Doliolaria
  - (C) Ophiopluteus
  - (D) Echinopluteus
3. The echinoderms are related to chordates by their similarity in the development of \_\_\_\_\_.
  - (A) Gut
  - (B) Nervous system
  - (C) Heart
  - (D) Coelom
4. Foot of Lamellidens is used for \_\_\_\_\_.
  - (A) Anchoring
  - (B) Walking
  - (C) Swimming
  - (D) All of these
5. Horse shoe crab is included under the subclass \_\_\_\_\_.
  - (A) Xyphosura
  - (B) Crustacean
  - (C) Archnida
  - (D) Eurypterida
6. Archaeocytes migrate out through the \_\_\_\_\_ to reconstruct sponges during Asexual Reproduction.
  - (A) Gemmule
  - (B) Micropyle
  - (C) Spicule
  - (D) Filament
7. This does not belong to Phylum Cnidaria :
  - (A) Sea cucumber
  - (B) Sea feather
  - (C) Sea pen
  - (D) Sea fan
8. Medusae are formed by \_\_\_\_\_.
  - (A) Gastrozooids through asexual reproduction
  - (B) Blastostyles through asexual reproduction
  - (C) Both through sexual reproduction
  - (D) None of these

9. Which of the following protozoan causes African sleeping sickness ?
- Plasmodium vivax**
  - Entamoeba gingivalis**
  - Trypanosoma lewsi**
  - Trypanosoma gambiense**
10. Schizont stage of plasmodium is found in human \_\_\_\_\_ cells.
- Hepatocytes
  - Erythrocytes and hepatocytes
  - Erythrocytes
  - Nephrocytes
11. In Branchiostoma, notochord is present in \_\_\_\_\_.
- Tail region
  - Head region
  - Throughout the body
  - Larval stage
12. Member of the class Myxini \_\_\_\_\_.
- Hagfish
  - Ostracoderm
  - Lampreys
  - Urochrods
13. Which of the the following aortic arches form pulmonary artery in lung fishes ?
- II
  - IV
  - V
  - VI
14. Snake venom is produced by modified \_\_\_\_\_.
- Thyroid gland
  - Salivary gland
  - Pancreatic gland
  - None of these
15. Flight muscles of bird are attached to \_\_\_\_\_.
- Sternum bone
  - Coracoids bone
  - Scapula
  - Clavicle
16. Horses and cows have teeth that have short roots but high crowns providing extra surface area for the wear and tear necessary for a fibrous diet. What is the name for this type of teeth ?
- Hysodont
  - Brachyodont
  - Monophodont
  - Polyphyodont
17. Species which have diverged after origin from common ancestor giving rise to new species adapted to new habitats and ways of life is called as \_\_\_\_\_.
- Adaptive radiation
  - Divergent evolution
  - Convergent evolution
  - Mutation

18. For the order Sirenia, which of the following is true ?
- (A) Is the only mammalian order with marine representatives
  - (B) Distribution is generally limited to tropical regions
  - (C) In all species tooth replacement method is similar to that in Proboscideans
  - (D) Needed relatively few modifications to survive as an aquatic species
19. The only snake to make a nest to lay eggs is \_\_\_\_\_.
- (A) Rat snake
  - (B) King cobra
  - (C) Rattle snake
  - (D) None of these
20. The larva of Lamprey is known as \_\_\_\_\_.
- (A) Tochophore
  - (B) Tadpole
  - (C) Ammocoetes
  - (D) Tornaria
21. The collection of individuals which belongs to the same species when live together in a region is known as \_\_\_\_\_.
- (A) Keystone species
  - (B) Community
  - (C) Guild
  - (D) Population
22. Which of the following defines the separation of two different communities ?
- (A) Ecotone
  - (B) Edge effect
  - (C) Ecade
  - (D) Resistance
23. Which of the following is a diversity index ?
- (A) Upright index
  - (B) Inverted index
  - (C) Bell shaped index
  - (D) Simpson's index
24. Which of the following gases are called Greenhouse gases ?
- (A) Methane
  - (B) Nitrogen
  - (C) Carbon dioxide
  - (D) Both (A) and (C)
25. Which of the following is the first national park in India ?
- (A) Gir National Park
  - (B) Kanha National Park
  - (C) Jim Corbett National Park
  - (D) Ranthambore National Park

26. The breeding place of Flamingo (Hansawar) in India is most likely \_\_\_\_\_.
- (A) Runn of Kutch  
(B) Ghana Vihar  
(C) Sambhar lake  
(D) Chilka lake
27. The square of standard derivation is called \_\_\_\_\_.
- (A) Quartile deviation  
(B) Mean absolute deviation  
(C) Range  
(D) Variance
28. If class intervals are not given, then it is called as a \_\_\_\_\_.
- (A) Discrete frequency distribution  
(B) Continuous frequency distribution  
(C) Grouped frequency distribution  
(D) None of these
29. Stabilizing selection favors \_\_\_\_\_.
- (A) Both extreme forms of a trait  
(B) Intermediate forms of a trait  
(C) Environmental differences  
(D) One extreme form over the other extreme form and over intermediate forms of a trait
30. The factors involved in the formation of new species are \_\_\_\_\_.
- (A) Isolation and competition  
(B) Gene flow and competition  
(C) Competition and mutation  
(D) Isolation and variation
31. The Hardy-Weinberg principle cannot operate if \_\_\_\_\_.
- (A) A population does not migrate for a longtime to a new habitat  
(B) Frequent mutations occur in the population  
(C) The population has no chance of interaction with other populations  
(D) Free interbreeding occurs among all members of the population
32. Genetic drift operates only in \_\_\_\_\_.
- (A) Larger populations  
(B) Mendelian populations  
(C) Island populations  
(D) Smaller populations

33. Which of the following is most important for speciation ?
- Seasonal isolation
  - Reproductive isolation
  - Behavioural isolation
  - Tropical isolation
34. The hormone that is secreted to help with sleep is called \_\_\_\_\_.
- Dopamine
  - Melatonin
  - Serotonin
  - Progesterone
35. Genetic drift operates only in \_\_\_\_\_.
- Larger populations
  - Mendelian populations
  - Island populations
  - Smaller populations
36. Which of the following reproductive behaviours can be easily observed ?
- Pheromone release
  - Vocalizations
  - Ovulation
  - Mating dance
37. Silk is produced by \_\_\_\_\_.
- Cocoon
  - Adult moth
  - Larva
  - Larva and adult moth
38. Silk contains a protein known as \_\_\_\_\_.
- Casein
  - Fibroin
  - Sericin
  - Both fibroin and sericin
39. Hypophysis is related to \_\_\_\_\_.
- Pituitary gland
  - Pineal gland
  - Adrenal gland
  - Corpus of stannius
40. Gynogenesis means \_\_\_\_\_.
- Chromosomal manipulation
  - Parthenogenetic development
  - Polyploidy
  - Inbreeding
41. Fish that live their adult life in the sea but migrate up to fresh water rivers to spawn are \_\_\_\_\_.
- Potamodromous
  - Catadromous
  - Oceanodromous
  - Anadromous

42. Which of the following describes a process that involves viral integration into the host genome ?
- Lysogenic cycle
  - Lytic cycle
  - Prophage
  - None of these
43. What is the name for the transfer of genetic information from one bacterium to another bacterium by a phage ?
- Transduction
  - Penetration
  - Excision
  - Translation
44. The envelope of a virus is derived from the host's \_\_\_\_\_.
- Nucleic acids
  - Membrane structures
  - Cytoplasm
  - Genome
45. Which of the following is true of prions ?
- They can be inactivated by boiling at 100°C
  - They contain a capsid
  - They are a rogue form of protein, PrP
  - They can be reliably inactivated by an autoclave
46. Microfilaments are composed of a protein called \_\_\_\_\_.
- Tubulin
  - Actin
  - Myosin
  - Chitin
47. The fluidity of the plasma membrane increases with :
- Increase in unsaturated fatty acids in the membrane
  - Increase in saturated fatty acids in the membrane
  - Increase in glycolipid content in the membrane
  - Increase in cholesterol content in the membrane
48. Which cell organelle is involved in apoptosis ?
- Lysosome
  - ER
  - Golgi
  - Mitochondria
49. Distribution of intrinsic proteins in the plasma membrane is \_\_\_\_\_.
- Random
  - Symmetrical
  - Asymmetrical
  - None of these

50. Why is transport across the plasma membrane necessary ?
- Transport of substances for metabolic activities
  - Movement of waste product out of cell
  - Movement of substances produced by cells
  - All of these
51. Which type of movement occurs when Na/K pump is used ?
- Na ions moves out of the cell and K<sup>+</sup> move in
  - K<sup>+</sup> ion moves out of cell and Na ion move in
  - Both Na and K<sup>+</sup> ions move inside the cell
  - Both Na and K<sup>+</sup> ion move out of the cell
52. The stage which serves as a connecting link between Meiosis 1 and Meiosis 2 \_\_\_\_\_.
- Interphase 2
  - Interphase 1
  - Interkineses
  - None of these
53. Cyclin is associated with \_\_\_\_\_.
- Leptospirosis
  - Glycolysis
  - Cylosis
  - Mitosis
54. Which of the following statement is true about the ends of the chromosome ?
- The ends of the chromosome are called Satellites
  - The ends of the chromosome are called Centromeres
  - The ends of the chromosome are called Telomeres
  - The ends of the chromosome are called Kinetochore
55. Which of the following statement is true about the chromatin composition ?
- DNA
  - RNA
  - DNA and Proteins
  - DNA, RNA and Proteins
56. Name the gland that is located at the base of the throat, just inferior to the laryngeal prominence (Adam's apple) :
- Pituitary
  - Pineal gland
  - Hypothalamus
  - Thyroid



57. The endocrine gland responsible for the body's circadian rhythm is the \_\_\_\_\_.
- (A) Thymus gland
  - (B) Pineal gland
  - (C) Parathyroid gland
  - (D) Pituitary gland
58. Which of the following is used as an osmolyte in humans to increase medullary interstitial osmolality during concentration of urine ?
- (A) Urea
  - (B) TMAO
  - (C) Both Urea and TMAO
  - (D) Uric acid
59. Most of the marine invertebrates are \_\_\_\_\_.
- (A) Osmoregulation
  - (B) Osmoconformers
  - (C) Both depend on seawater concentration
  - (D) None of these
60. Kidney matrix retains some quantity of urea to maintain \_\_\_\_\_.
- (A) Metabolism
  - (B) Micturition
  - (C) Desired osmolarity
  - (D) Balance of the body
61. \_\_\_\_\_ is located between two pleural sacs and is the central compartment of the thoracic cavity ?
- (A) Hilum
  - (B) Pleura
  - (C) Mediastinum
  - (D) Thoracic cage
62. Which of the following statement is true about involuntary breathing ?
- (A) It is controlled by the bronchioles
  - (B) It is controlled by the pulmonary arterioles
  - (C) It is controlled by the alveolar-capillary network
  - (D) It is controlled by the neurons, located in the medulla and pons
63. The thalamus and the hypothalamus are located in the \_\_\_\_\_.
- (A) Brain stem
  - (B) Cerebrum
  - (C) Cerebellum
  - (D) Diencephalon
64. \_\_\_\_\_ is a blood disorder where the haemoglobin is defective.
- (A) Heterochromia
  - (B) Alopecia
  - (C) Haemolysis
  - (D) Sickle cell anaemia

65. The gap in the myelin sheath between adjacent Schwann cells is called \_\_\_\_\_.
- (A) Soma  
(B) Dendrite  
(C) Node of Ranvier  
(D) None of these
66. Smooth muscles, cardiac muscles and organs are regulated by \_\_\_\_\_.
- (A) Central nervous system  
(B) Parasympathetic nervous system  
(C) Sympathetic nervous system  
(D) Autonomic system
67. Umbilical cord contains \_\_\_\_\_.
- (A) Pluripotent stem cells  
(B) Cord blood stem cells  
(C) Blood stem cells  
(D) None of these
68. Wolffian duct is also known as \_\_\_\_\_.
- (A) Mesonephric duct  
(B) Ejaculatory duct  
(C) Major sublingual duct  
(D) Cystic duct
69. Humans use haemoglobin to carry oxygen in their blood. Similarly, mollusks and crustaceans use \_\_\_\_\_ to carry oxygen in their blood.
- (A) Hemovanadin  
(B) Hemerythrin  
(C) Haemoglobin  
(D) Hemocyanin
70. Which of the following is the first complex (Complex I) of ETS ?
- (A) NADH dehydrogenase  
(B) Cytochrome  $aa_3$   
(C) Cytochrome  $bc_1$   
(D) ATP synthase
71. ATP synthesis by ATP synthase is driven by the movement of \_\_\_\_\_.
- (A) Protons  
(B) NADH  
(C) Electrons  
(D) All of these
72. Which of the following products of glucose oxidation are necessary for oxidative phosphorylation ?
- (A) Pyruvate  
(B) NADH and  $FADH_2$   
(C) Acetyl CoA  
(D) NADPH and ATP

73. Which of the following is not true about secondary protein structure ?
- (A) The hydrophilic / hydrophobic character of amino acid residues is important to secondary structure
  - (B) The ability of peptide bonds to form intra molecular hydrogen bonds is important to secondary structure
  - (C) The alpha helix, beta pleated sheet and beta turns are examples of protein secondary structure
  - (D) The steric influence of amino acid residues is important to secondary structure
74.  $\beta$ -pleated sheets are the examples of \_\_\_\_\_.
- (A) Primary structure
  - (B) Secondary structure
  - (C) Tertiary structure
  - (D) Quaternary structure
75. Which of the following glucose transporters are important in fructose transport in the intestine ?
- (A) GLUT5
  - (B) GLUT3
  - (C) GLUT4
  - (D) GLUT7
76. Which of the following is a tricarboxylic acid ?
- (A) Acetic acid
  - (B) Succinic acid
  - (C) Oxaloacetic acid
  - (D) Citric acid
77. Which of these amino acids are essential for infants ?
- (A) Methionine
  - (B) Arginine and Histidine
  - (C) Valine
  - (D) Lysine and Leucine
78. A genomic DNA possesses functioning units, a group of genes under the influence of promoters known \_\_\_\_\_ as \_\_\_\_\_.
- (A) Genes
  - (B) Operons
  - (C) Anticodon
  - (D) Codon
79. The transcriptional gene control in eukaryotes is mediated by \_\_\_\_\_.
- (A) Metabolites that bind to the cis-acting elements
  - (B) Trans-acting factors failing to bind to cis-acting elements
  - (C) Trans-acting factors binding to cis-acting elements
  - (D) Repressor proteins that bind to operator sites

80. Triacylglycerol packed with the apolipoprotein and cholesterol in lipoprotein aggregate is called \_\_\_\_\_
- (A) Chylomicrons  
(B) VLDL  
(C) HDL  
(D) LDL
81. When the velocity of enzyme activity is plotted against substrate concentration, which of the following is obtained ?
- (A) Hyperbolic curve  
(B) Parabola curve  
(C) Straight line with positive slope  
(D) Straight line with negative slope
82. Beta oxidation of fatty acid takes place inside \_\_\_\_\_
- (A) Mitochondria  
(B) Cytoplasm  
(C) Golgi body  
(D) Ribosome
83. How many types of antibodies are there ?
- (A) Five  
(B) Three  
(C) Two  
(D) Four
84. Which of the following statement is true about the IgM of humans ?
- (A) IgM can cross the placenta  
(B) IgM can protect the mucosal surface  
(C) IgM is produced by high-affinity plasma cells  
(D) IgM is primarily restricted in the circulation
85. Monocytes differentiate into which kind of phagocytic cells ?
- (A) Neutrophil  
(B) B cell  
(C) Macrophage  
(D) T cell
86. After a sperm has penetrated an ovum in the process of fertilization, entry of further sperms is prevented by \_\_\_\_\_
- (A) Condensation of yolk  
(B) Development of the vitelline membrane  
(C) Formation of the fertilization membrane  
(D) Development of the pigment coat
87. Grey crescent is the area \_\_\_\_\_
- (A) At the point of sperm entry into ovum  
(B) Just opposite to the site of entry of sperm into ovum  
(C) At the animal pole of the ovum  
(D) At the vegetal pole of the ovum

88. Repetitive regeneration can be seen in \_\_\_\_\_.
- (A) Molluscs  
(B) Tadpole  
(C) Hydra  
(D) None of these
89. Embryonic stem cells can differentiate into which types of cell ?
- (A) Only brain stem cells are specialized brain cells  
(B) All types of specialized cells in the body  
(C) Only cells that can produce insulin  
(D) Only cells that can produce artificial skin
90. What are the roles of stem cells in our bodies ?
- (A) We are not sure what roles stem cells play in the body  
(B) They produce new specialized cells to replace cells that die or are used up  
(C) They fight against infections  
(D) They perform specialized roles in the body (e. g. produce insulin, transmit signals)
91. Blastopore is \_\_\_\_\_.
- (A) Opening of neural tube  
(B) Opening of gastrocoel  
(C) Future anterior end of embryo  
(D) Opening of blastocoel
92. Fluorescence microscopy, which of the following performs the function of removing all light except the blue light ?
- (A) Exciter filter  
(B) Barrier filter  
(C) Dichroic mirror  
(D) Mercury arc lamp
93. In Phase Contrast microscopy, the rate at which light enters through objects is \_\_\_\_\_.
- (A) Constant  
(B) Inversely proportional to their refractive indices  
(C) Directly proportional to their refractive indices  
(D) Exponentially related to their refractive indices
94. In which chromatography stationary phase is more polar than mobile phase ?
- (A) Ion exchange chromatography  
(B) Normal phase chromatography  
(C) Reversed chromatography  
(D) Size exclusion chromatography

95. In thin layer chromatography, the stationary phase is made of \_\_\_\_\_ and the mobile phase is made of \_\_\_\_\_.
- (A) Solid, liquid  
 (B) Liquid, liquid  
 (C) Liquid, gas  
 (D) Solid, gas
96. The polymerase chain reaction is \_\_\_\_\_.
- (A) It is a DNA sequencing technique  
 (B) It is a DNA degradation technique  
 (C) It is a DNA amplification technique  
 (D) All of these
97. Which of the following is the first and the most important step in the polymerase chain reaction ?
- (A) Annealing  
 (B) Primer extension  
 (C) Denaturation  
 (D) None of these
98. Primers used for the process of polymerase chain reaction are \_\_\_\_\_.
- (A) Single-stranded RNA oligonucleotide  
 (B) Single-stranded DNA oligonucleotide  
 (C) Double-stranded RNA oligonucleotide  
 (D) Single-stranded DNA oligonucleotide
99. One Svedberg unit is equivalent to  $10^{-13}$  \_\_\_\_\_.
- (A) Hours  
 (B) Minutes  
 (C) Seconds  
 (D) Milli-seconds
100. In which of the following techniques, the DNA is labelled using complementary sequences and then analyzed using autoradiography ?
- (A) Western blotting  
 (B) Southern blotting  
 (C) Isopycnic centrifugation  
 (D) Spectrophotometry

SPACE FOR ROUGH WORK