



Test Registration No. \_\_\_\_\_



**The Maharaja Sayajirao University of Baroda**  
Faculty of Science

M.Sc. ENTRANCE EXAMINATION

**SUBJECT: ZOOLOGY**

**DAY: MONDAY**

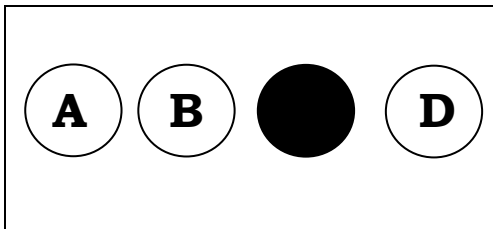
**TIME : 2.30 PM TO 4.00 PM**

**DATE: 26<sup>th</sup> June 2023**

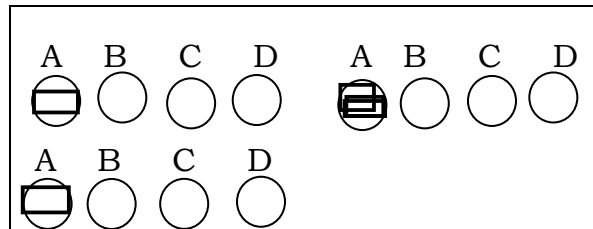
**Important Instructions:**

1. This test booklet is to be opened only when instructed by the invigilators to do so.
2. This booklet carries **100** questions in **13** printed pages. All carry equal marks.
3. For every correct answer, candidate will earn **1** mark, for every wrong answer **0.25** mark will be deducted.
4. Test Registration Number must be entered correctly in the OMR answer sheet, as advised by the invigilators. The Question Booklet code (A/B/C/D) must also be mentioned on the OMR answer sheet (if not printed already) as instructed.
5. Answers must be marked in the OMR answer sheet using a black or dark blue ball point pen only. The circle should be filled in completely, leaving no gaps.
6. Gadgets (Mobile phones, pagers, ear phones, music players, calculators smart watches etc.) are strictly prohibited in the exam hall. If any candidate is found in possession of any of these at his/her exam seat, he/she is liable to be disqualified.
7. In case of tie in the marks the merit will be considered based on total marks in qualifying examination.

**Correct way of marking answer:**



**Incorrect way of marking answer:**



**Invigilator's Signature:** \_\_\_\_\_

1. One of the following options is **True** that explains the relationship between individuals of two species of which one is benefited and the other is almost unaffected
  - A. Parasitism
  - B. Commensalism
  - C. Symbiosis
  - D. Predation
  
2. What is a competition between the individuals of two separate species for sharing the same resources in the same area known?
  - A. Apparent competition
  - B. Interspecific competition
  - C. Interference competition
  - D. Intraspecific competition
  
3. Zoonoses are those diseases and infections which are naturally transmitted between vertebrate animals and man. Which according to you is the correct option explaining factors influencing prevalence of zoonoses?
  - A. Ecological changes in man's environment
  - B. Handling animal by-products and wastes
  - C. Increased density of animal population
  - D. All of the above
  
4. Systematics deals with:
  - A. Identification of organism
  - B. Classification of organisms
  - C. The kinds and diversity of all organisms and the existing relationships amongst themselves
  - D. Identification, naming and classification of both plants and animals
  
5. Assertion: Leglessness is an apomorphy for snakes.  
Reason: Snakes lost complex traits such as limbs for adaptation in course of evolution.
  - A. Both assertion and reason are true and reason is the correct explanation of assertion
  - B. Both assertion and reason are true but reason is not the correct explanation of the assertion
  - C. Assertion is true but reason is false
  - D. Both assertion and reason are false
  
6. In phylogeny that have a sister group, one of the following is the most appropriate option:
  - A. Two descendants that split from the same node
  - B. Two descendants that split from the different node
  - C. A taxon outside the group of interest
  - D. Two descendants that do not share all the characteristics.
  
7. What would the expected effect be on a PCR reaction if the primers used were slightly shorter and more variable than the intended oligonucleotide sequences?
  - A. The PCR reaction would not commence
  - B. The PCR reaction would end after one cycle
  - C. The reaction would generate a single short PCR product
  - D. The reaction would yield a mixture of non-specific products

8. Which of the following separation techniques is dependent on difference in volatility?
- Distillation
  - Crystallization
  - Magnetic separation
  - Fractional crystallization
9. Which of the following statements about the reactions of glycolysis is correct?
- In glycolysis glucose-6-phosphate is split into glyceraldehyde-3-phosphate and dihydroxyacetone phosphate.
  - In glycolysis fructose-1,6-bisphosphate is split into glyceraldehyde-3-phosphate and dihydroxyacetone phosphate.
  - In glycolysis fructose-6-phosphate is split into glyceraldehyde-3-phosphate and dihydroxyacetone phosphate.
  - In glycolysis glucose-6-phosphate is isomerized to fructose-1:6-bisphosphate.
10. Which of the following statements about the integration of fat and carbohydrate metabolism control in diabetes mellitus is correct?
- High insulin/glucagon ratio inactivates lipolysis in liver.
  - High insulin/glucagon ratio activates lipolysis in adipocytes.
  - Low insulin/glucagon ratio activates lipolysis in adipocytes.
  - Insulin-dependent glucose transporters are recruited to their functional membrane site by low insulin levels.
11. Which of the following is an accurate description of the consequences of the positive and negative selection of T cells in the thymus?
- It results in a diverse population of T cells with high affinity for self (MHC/peptide)
  - It leads to the deletion of T cells with a low affinity for self (MHC/peptide)
  - It results in a diverse population of T cells with low affinity for self (MHC/peptide)
  - It leads to the deletion of T cells with a high affinity for self (MHC/peptide)
12. The antigen-binding region of an antibody molecule is found in the:
- Hinge region
  - Variable light chain
  - Variable heavy chain
  - Variable heavy and light chain
13. Which type of cell specifically destroys virally infected body cells?
- Phagocytic macrophages
  - Cytotoxic T lymphocytes
  - Activated B lymphocytes
  - Plasma cells
14. Which of the following statement related to circulatory physiology is true?
- Erythropoiesis; a process of formation of new RBCs takes place only in liver
  - Ferritin is obtained after splitting of protein globin
  - Bilirubin is eliminated in intestine and excreted along with feces
  - All of the above

15. What can be the consequence/s of low platelet count in human blood?
- A. Can cause poor oxygen availability leading to exhaustion
  - B. Can prevent formation of RBCs in bone marrow
  - C. Can cause bleeding through the skin or underneath the surface of skin
  - D. None of them; as platelets have no role in gaseous exchange, haemorrhage or clotting
16. The wall of stomach does not dissolve under the action of HCL. Why?
- A. Because it is made of chitin
  - B. Because the wall of stomach is covered with mucous
  - C. Because the wall of stomach is made of very strong muscles
  - D. Because the HCL secreted in stomach is very dilute
17. Which of the following correctly depicts fact about catadromous and anadromous fishes?
- A. Catadromous fishes migrate from sea to fresh water and anadromous fishes migrate from freshwater to sea.
  - B. Catadromous fishes migrate from freshwater to sea and anadromous fishes migrate from sea to fresh water.
  - C. Catadromous fishes migrate from brackish water to freshwater whereas anadromous fishes migrate from pond water to rivers.
  - D. Fishes never migrate from one type of water to another due to difference in salinity.
18. Intergalactic dust was generated from the explosion of
- A. Black hole
  - B. Brown dwarf
  - C. Centripetal force of ions and molecules
  - D. Supernova
19. Statement A: The earth's present atmosphere oxygen is in highest content.  
Statement B: The second highest gas in earth's atmosphere is nitrogen.
- A. Both A and B are true
  - B. A is true but B is false
  - C. B is true but A is false
  - D. Both A and B are false
20. Which of the following is not a consequence of global climate change?
- A. Increased air temperature
  - B. Tsunami and earthquakes
  - C. Polar ice melting
  - D. Rise in Sea level
21. Which of the following countries recently faced the tremendous effect of "Heat Dome" phenomenon?
- A. United States of America and Canada
  - B. China and Russia
  - C. Australia and New Zealand
  - D. Middle east countries

22. According to Shelford's law of tolerance an organism with wide tolerance limit for environmental factors usually show
- Wide distribution with low population size
  - Wide distribution with high population size
  - Narrow distribution with low population size
  - Narrow distribution with high population size
23. Continental drift theory indicates that earth was a single mass from which land masses drifted in different directions to establish present distribution of land. The theory was proposed by
- Alfred Wegener
  - Charles Darwin
  - Schleiden and Schwann
  - Ernest Mayr
24. The bottom area where production is less than respiration in a pond ecosystem is termed as \_\_\_\_\_.
- Profundal zone
  - Tidal zone
  - Benthic zone
  - Limnetic zone
25. The ratio between energy flow at different points in a food chain is known as \_\_\_\_\_.
- Ecological capacity
  - Ecological efficiency
  - Ecological assimilation
  - Ecological potential
26. What type of food chain is it?  
dead animals → blowfly maggot → maggots → frog → snake
- Detrital food chain
  - Decomposer food chain
  - Predator food chain
  - Grazing food chain
27. "The pyramid of energy is always upright" states that
- The energy conversion efficiency of herbivores is better than carnivores
  - The energy conversion efficiency of carnivores is better than herbivores
  - Producers have the lowest energy conversion efficiency
  - Energy conversion efficiency is the same in all trophic levels
28. Which of the following correctly depicts the hierarchy of classification in descending order?
- Phylum – Order – Class – Family – Genus – Species
  - Phylum – Order – Class – Species – Genus – Family
  - Phylum – Class – Order – Family – Genus – Species
  - Phylum – Cohort – Class – Order - Genus – Species

29. Based on the animals and their body symmetry, which of the following combination is true?  
1-Planaria, 2-Hydrophis, 3-Metridium, 4-Bellostoma, 5-honey bee  
x-Radial symmetry, y-Bilateral Symmetry
- A. 1-x, 2-y, 3-y, 4-x, 5-y
  - B. 1-y, 2-y, 3-x, 4-y, 5-y
  - C. 1-x, 2-x, 3-y, 4-y, 5-x
  - D. 1-y, 2-x, 3-y, 4-x, 5-x
30. Which of the following body part is lacking in acoelomates?
- A. Oesophagus
  - B. Stomach
  - C. Body cavity
  - D. Anus
31. Which of the following phylum has maximum number of organisms on earth?
- A. Cnidaria
  - B. Arthropoda
  - C. Protozoa
  - D. Platyhelminthes
32. Which of the following has been documented to have phylogenetic proximity to tetrapods?
- A. Harpodon
  - B. Latimeria
  - C. Pristis
  - D. Antennarius
33. Viruses are essentially made up of \_\_\_\_\_.
- A. Nucleic acids and Proteins
  - B. Lipids and Proteins
  - C. Carbohydrates and Proteins
  - D. Carbohydrates and Lipids
34. Bacteriophage shows \_\_\_\_\_ symmetry.
- A. Octahedral
  - B. Binal
  - C. Icosahedral
  - D. Helical
35. Rod shaped bacteria are known as \_\_\_\_\_.
- A. Spirilli
  - B. Cocci
  - C. Bacilli
  - D. Vibrio
36. Fluid -mosaic model of plasma membrane proposed by
- A. Singer and Nicolson
  - B. Robertson
  - C. Nagelli
  - D. Gerter and Gridella

37. Volvox is an example of \_\_\_\_\_ thallus.
- A. Filamentous
  - B. Branched
  - C. Colonial
  - D. Unicellular
38. Mycology is the branch of biology that is concerned with the study of \_\_\_\_\_.
- A. Algae
  - B. fungi
  - C. Bryophyte
  - D. Pteridophyte
39. *Amoeba* feed by \_\_\_\_\_ method when prey is active.
- A. Circumfluence
  - B. Circumvallation
  - C. Import
  - D. Invagination
40. When food is liquid, Protozoans take it in by \_\_\_\_\_.
- A. Pinocytosis
  - B. Circumfluence
  - C. Invagination
  - D. Import
41. Filariasis is caused by \_\_\_\_\_.
- A. *Taenia solium*
  - B. *Entamoeba histolytica*
  - C. *Wuchereria bancrofti*
  - D. *Plasmodium vivax*
42. \_\_\_\_\_ insect cause damage to wood/timber.
- A. Cockroach
  - B. Mosquito
  - C. Termite
  - D. Butterfly
43. Shellac is obtained from waxy secretions of \_\_\_\_\_.
- A. Lac insect
  - B. Stick insect
  - C. Leaf insect
  - D. Scale insect
44. \_\_\_\_\_ is an example of social insect.
- A. Dung beetle
  - B. Cockroach
  - C. Honey bee
  - D. Butterfly

45. The endocrine gland of insects, which secretes the juvenile hormone is
- Corpora albicans
  - Corpora allata
  - Corpora myecaena
  - All of the above
46. \_\_\_\_\_, a molluscan animal was used as money by American Indians.
- Chiton
  - Murex
  - Octopus
  - Dentalium
47. “Jet Propulsion” principle is used by \_\_\_\_\_.
- Nautilus
  - Octopus
  - Cowry
  - Pearl oyster
48. Sieve plate located on aboral surface of starfish is also called as \_\_\_\_\_.
- Pollian vesicle
  - Tiedmann’s bodies
  - Madreporite
  - Tube feet
49. The subunit of prokaryotic ribosomes are:
- 60 S + 40 S
  - 70 S + 30 S
  - 60 S + 30 S
  - 50 S + 30 S
50. Mark the correct statement regarding the nucleic acid structure:
- Purines are double ringed structures
  - DNA helical structure proposed by Watson and Crick resembles the A-form
  - The pentose ring binds to the nitrogen base at 2’ carbon position
  - The complimentary bases are bound by glycosidic bonds
51. 18q12 refers to which of the following region of a chromosome?
- 18<sup>th</sup> region on 12<sup>th</sup> chromosome of q arm
  - 12<sup>th</sup> region on 18<sup>th</sup> chromosome of q region
  - 12<sup>th</sup> region on q arm of 18<sup>th</sup> chromosome
  - 18<sup>th</sup> segment of q region of 12 chromosome
52. Which of the following best describes ‘corridor habitats’ in India?
- Habitat that are fragmented and not connected with any other forest.
  - Habitat that are on the periphery of the forest.
  - Habitat that connects two major protected areas.
  - Habitat that has a road passing through that divides it into two parts.



53. Why is the 'pug mark' census method not preferred for tiger or leopard count?
- High risk of life is involved in this type of census
  - The animals can get disturbed due to equipment used in pugmark census
  - Animals of same species have same pugmarks and hence cannot be differentiated
  - Pugmarks appear to be different in varying soil types creating errors
54. Which one of the following sub-regions is also known as "Marsupial home"?
- Austro-Malayan
  - Australian
  - Polynesian
  - New Zealand
55. When a bird while feeding catches its prey by talons, it is called as \_\_\_\_\_.
- Raptorial feeding
  - Scavenging
  - Klepto-parasitism
  - Filter feeding
56. In which region, the ungulate 'Thar' is found?
- Ladakh
  - Nilgiri
  - Andaman
  - Arunachal
57. What is the concept of 'dark sky reserve' for protected areas in the world?
- Forest areas with no artificial and night lights
  - Forests with perineal clouds and minimal visibility of stars
  - Forests with high fog/smog and poor visibility of sky
  - Forests with 100% resident bird population and no migratory birds
58. The biological lipids in solution self-assemble into thin bilayer membranes that can compartmentalise into different regions within a cell and protect the inside of the cell from the external environment. The ability of these membranes to remain intact even when the bathing medium is extremely depleted of lipids is due to their:
- extremely low critical micelle concentration
  - long range vanderwaal's forces
  - covalent attractions
  - hydrophilic attractions
59. A graph showing two humps of greatest frequency is said to be \_\_\_\_\_.
- Bimodal
  - Binodal
  - Bionominal
  - Bivariate
60. If the gene for a trait is shown in the genotype of both male and female, but is expressed only in the female, then the type of inheritance is referred to as:
- Sex-linked inheritance
  - Sex-limited inheritance
  - Sex-influenced inheritance
  - Extrachromosomal inheritance

61. Plasmid allowing genes to be transferred between bacterial cells is:
- A. Col Plasmid
  - B. Virulence Plasmid
  - C. Resistance Plasmid
  - D. Fertility Plasmid
62. Mark the incorrect statement from below, with respect to histone proteins in the eukaryotes:
- A. Histones are positively charged which allows them to bind to the negatively charged DNA
  - B. The histone proteins contain 20 to 30 percent arginine and lysine
  - C. The histones are chemically inactive and allow no modification
  - D. The histones are replaced by small proteins called protamines in some sperm cells.
63. Which among the following is structurally the simplest type of bacterial transposon?
- A. Insertion sequence elements
  - B. composite transposons
  - C. Tn3 elements
  - D. SINES
64. In spermatogenesis the phase of maturation involves:
- A. The formation of PGC from the spermatocytes through meiosis
  - B. The formation of spermatids from primary spermatocytes through meiosis
  - C. The growth of spermatogonia into primary spermatocytes
  - D. The formation of spermatogonia from gonocytes through mitosis
65. The initial dorsal-ventral axis is established by the \_\_\_\_\_ in amphibian embryos.
- A. The point of sperm entry
  - B. Nature of gene expression
  - C. Direction of gravitational force
  - D. Axis of first cleavage
66. Which among the following acts as the terminal organizer during *Drosophila* development?
- A. Nanos
  - B. Bicoid
  - C. Caudal
  - D. Torso
67. The connective tissue, Tendons connect \_\_\_\_\_.
- A. Ligaments to muscle
  - B. Muscles to bones
  - C. Bones to bones
  - D. Ligament to bones
68. The tissue which is most abundant type in the complex animals is \_\_\_\_\_.
- A. Muscle tissue
  - B. Nervous tissue
  - C. Connective tissue
  - D. Epithelial tissue

69. The process through which the epidermis and dermis of skin is preserved by means of some chemicals is known as \_\_\_\_\_.
- A. Albinism
  - B. Toxicology
  - C. Taxidermy
  - D. Tanning
70. Which of the following deuterostome does not show true enterocoelic mode of coelom formation?
- A. Frog
  - B. Star fish
  - C. Amphioxus
  - D. Balanoglossus
71. The animals showing biradial symmetry are \_\_\_\_\_.
- A. Annelids
  - B. Ctenophores
  - C. Radiolarians
  - D. Cnidarians
72. On the basis of which of the following character the Cnidarians are strongly proposed for consideration as triploblastic animals?
- A. Mesenteries are comparable to mesothelial epithelium of Platyhelminthes
  - B. Blood vessels are present which are derived from true mesoderm
  - C. Mesogleal amoebocytes are comparable to mesenchymal mesoderm
  - D. The myelinated neurons are derived from true mesoderm
73. The correct order of the mentioned periods in the Paleozoic era is:
- A. Cambrian, Ordovician, Silurian, Devonian
  - B. Carboniferous, Ordovician, Silurian, Devonian
  - C. Cambrian, Silurian, Devonian, Ordovician
  - D. Carboniferous, Silurian, Devonian, Ordovician
74. The term “Anthropocene” is applied to one of the following geological epoch:
- A. Pliocene
  - B. Holocene
  - C. Oligocene
  - D. Eocene
75. Which amongst the following is an example to Discontinuous Distribution?
- A. Ostracoderms
  - B. Bony fishes
  - C. Elasmobranchs
  - D. Dipnoans
76. The native of flightless bird Kiwi is:
- A. Neo-tropical region
  - B. Ethiopian region
  - C. Australian region
  - D. Oriental region

77. The largest mass extinction event that led to the disappearance of 95% of marine species and nearly 70% of terrestrial ones, occurred during the end of \_\_\_\_\_ period.
- A. Ordovician
  - B. Permian
  - C. Cretaceous
  - D. Devonian
78. Ethiopian zoogeographic region is a part of ancient landmass known as:
- A. Pangaea
  - B. Gondwana
  - C. Laurasia
  - D. Siberia
79. *Bacillus thuringiensis*, Bt is naturally occurring soil bacteria used in agriculture biotechnology to protect the crop against \_\_\_\_\_ pest.
- A. Lepidopteran
  - B. Hymenopteran
  - C. Homopteran
  - D. Coleopteran
80. Maximum numbers of transgenic \_\_\_\_\_ are produced for biological studies.
- A. Pig
  - B. Mice
  - C. Rat
  - D. Fish
81. In India, genetically modified brinjal is developed for:
- A. Drought resistance
  - B. Insect resistance
  - C. Disease resistance
  - D. High nutrition quality
82. \_\_\_\_\_ is a pH *indicator* frequently used in animal cell culture medium.
- A. Phenol red
  - B. Methyl orange
  - C. Thymol blue
  - D. All of the above
83. Restriction endonuclease recognizes \_\_\_\_\_ sequence.
- A. Tandem repeat
  - B. Non coding
  - C. Palindrome
  - D. Poly A
84. For some freshwater fishes, Technique of *hypophysation* is performed for \_\_\_\_\_.
- A. Induced breeding
  - B. Increased Size
  - C. Induced growth
  - D. Increased palatability

85. Royal jelly is produced from which gland of worker bee?
- A. Mandibular gland
  - B. Wax gland
  - C. Abdominal gland
  - D. Antennal gland
86. In classical condition, initially the salivation occur by offering food alone is known as:
- A. Conditional stimulus
  - B. Conditional response
  - C. Unconditional stimulus
  - D. Unconditional response
87. One of the following is an appropriate behavior involved when goslings follow the first moving object they see immediately after hatching:
- A. Territoriality
  - B. Imprinting
  - C. Operant conditioning
  - D. Fixed
88. An animal that sacrifices own life for benefit of other animals is exhibiting:
- A. Altruism
  - B. Learning
  - C. Caring
  - D. Hierarchy
89. The first scientist to translate the meaning of bee dance.
- A. Jurgen Tautz
  - B. Karl von Frisch
  - C. Ferdinand de Saussure
  - D. Gould J. L.
90. Chemical signals between individuals of the same species are called:
- A. Endogenous
  - B. Enzymes
  - C. Pheromones
  - D. Hormones
91. Which of the following best represents Lamarck's ideas on the evolutionary process?
- A. Survival of the fittest
  - B. Inheritance of acquired characteristics
  - C. Neutral drift
  - D. Punctuated equilibrium
92. One of the following justifies the neo-Darwinism of natural selection?
- A. Fighting between organism
  - B. Variations
  - C. Differential reproduction
  - D. Killing weaker organism

93. The occurrence of large or small beak sizes among seed crackers in the absence of medium-sized beaks is an example of
- A. Directional selection
  - B. Stabilizing selection
  - C. Disruptive selection
  - D. None of the above
94. The lack of allele variation in the northern elephant seal population is an example of:
- A. Mutations
  - B. Founder effect
  - C. Artificial selection
  - D. Bottleneck effect
95. Which of the following is immobilized on the microtiter well in sandwich ELISA?
- A. detection antibody
  - B. capture antibody
  - C. sample
  - D. secondary antibody conjugated to an enzyme
96. The random loss of alleles in a population is called \_\_\_\_\_.
- A. Mutation
  - B. Selection
  - C. Genetic drift
  - D. Gene flow
97. The protein connexins are found in:
- A. Tight Junction
  - B. Gap junction
  - C. Desmosomes
  - D. Hemidesmosomes
98. Cell to cell direct contact is involved in \_\_\_\_\_.
- A. Juxtacrine signaling
  - B. Paracrine signaling
  - C. Autocrine signaling
  - D. Endocrine signaling
99. Which one of the following is NOT rodent?
- A. Rabbit
  - B. Rat
  - C. Mouse
  - D. Hamster
100. In meiosis crossing over occurs during
- A. Prophase I
  - B. Prophase II
  - C. Metaphase
  - D. Anaphase

**END OF THE PAPER**