Seat No.	

ENT-57

Total No. of Pages : 24

M.Sc. Zoology Entrance Examiantion 2026
Sub. Code: 58719

Day and Date : Tuesday, 21-07-2026 **Total Marks : 100**
Time : 02.30 p.m. to 04.00 p.m.

Instructions
1) All questions are compulsory.
2) Each question carries 1 mark.
3) Answers should be marked in the given OMR sheet by darkening the appropriate option.
4) Follow the instructions given on OMR Sheet.
5) Rough work shall be done on the sheet provided at the end of question paper.

1. Which nuclear component is directly involved in ribosomal RNA synthesis?

   A. Chromatin B. Nuclear membrane

   C. Nucleolus D. Nucleoplasm

2. Neo-Darwinism differs from Darwinism primarily by incorporating .....

   A. Fossil evidence B. Mutation and genetics

   C. Use and disuse D. Catastrophism

3. Assertion (A): The fluidity of the plasma membrane increases with unsaturated lipids.

   Reason (R): Unsaturated fatty acids have kinks preventing tight packing.

   A. Both A and R are true, and R is the correct explanation of A

   B. Both A and R are true, but R is NOT the correct explanation of A

   C. A is true, but R is false

   D. A is false, but R is true

4. A man with blood group A (heterozygous) marries a woman with blood group B (heterozygous). What is probability of child having blood group O?

   A. 1/2 B. 1/4

   C. 1/8 D. 1/16

5. Severe joint pain is a characteristic symptom of .....

A. Malaria B. Dengue

C. Chikungunya D. Typhus

6. In rat heart, ... prevents backflow of blood from ventricles to atria.

A. Semilunar valves B. Chordae tendincac

C. Tricuspid and bicuspid valves D. Interventricular septum

7. Which of the following statements are correct regarding housefly as a vector?

p. It is a mechanical vector

q. Pathogens multiply inside its body

r. Transmission occurs via contaminated body parts

s. It can spread diseases like myiasis

Choose the correct alternative

A. p, r and s only B. p and q only

C. q, r and s only D. p,q,r and s

8. Which statement most precisely describes polymorphism in Hydrozoa?

A. Different individuals perform different functions independently

B. All zooids are structurally identical but functionally different

C. Specialized zooids are morphologically and functionally distinct yet interdependent

D. Polymorphism arises due to alternation between polyp and medusa

9. The function of the contractile vacuole in freshwater protozoans is .....

A. Digestion B. Respiration

C. Osmoregulation D. Reproduction

10. Match the Following

Organelles vs Special Features

List I	List II
A. Mitochondria	1. Cisternae
B. Golgi complex	2. Tubular network
C. ER	3. Hydrolytic enzymes
D. Lysosome	4. Cristae

Choose the correct combination

A. A-1, B-2, C-4, D-3 B. A-3, B-1, C-2, D-4

C. A-4, B-1, C-2, D-3 D. A-4, B-2, C-3, D-1

11. Match the following

Component	Property
A. Euchromatin	1. Transcriptionally inactive
B. Heterochromatin	2. DNA wrapped around histones
C. Nucleosome	3. Less condensed
D. Polytene chromosome	4. Gene amplification

Choose the correct combination:

A. A-2, B-1, C-3, D-4 B. A-1, B-2, C-3, D-4

C. A-2, B-3, C-1, D-4 D. A-3, B-1, C-2, D-4

12. If estrogen fails to reach high levels during late follicular phase, what will MOST likely happen?

A. Early ovulation B. No LH surge

C. Increased progesterone D. Formation of corpus luteum

13. If Sertoli cells are damaged but Leydig cells are normal, what will occur?

    A. No testosterone production

    B. Normal spermatogenesis

    C. Impaired spermatogenesis

    D. Increased sperm count

14. Which method of contraception primarily prevents implantation rather than fertilization?

    A. IUD (Copper-T) B. Oral pills

    C. Condoms D. Vasectomy

15. Which pathway produces NADPH instead of ATP?

    A. Glycolysis

    B. Krebs cycle

    C. Pentose phosphate pathway

    D. Electron transport chain

16. How does a Feedback Inhibitor typically regulate a multi-step metabolic pathway?

    A. By competitively binding to the active site of the final enzyme in the pathway.

    B. By acting as an allosteric modulator on the first committed/rate-limiting enzyme of the pathway.

    C. By increasing the \(V_{max}\) of the intermediate enzymes to clear the pathway faster.

    D. By covalently phosphorylating every enzyme in the pathway simultaneously.

17. Hemichordates were previously classified under Chordata but are now a separate Phylum. Which "chordate" feature do they lack upon closer anatomical inspection?

    A. A true dorsal tubular nerve cord; their nerve cord is ventral and solid.

    B. Pharyngeal gill slits; they use their proboscis for respiration instead.

    C. A true notochord; their "buccal diverticulum" is an outgrowth of the gut, not a mesodermal skeletal rod.

    D. A post-anal tail; they have no extension of the body beyond the anus.

18. Venom in snakes is primarily modified .....

    A. Salivary gland secretion B. Digestive enzyme

    C. Hormonal secretion. D. Blood protein

19. If a parasite reaches sexual maturity within a host, that host is classified as.....

    A. Intermediate B. Definitive

    C. Reservoir D. Paratenic

20. The vector for Rickettsia prowazekii (Epidemic typhus) is .....

    A. Rat flea B. Human body louse

    C. Tick D. Mite

21. The "White Leghorn" is the most popular exotic breed for .....

    A. Meat production (Broiler) B. Egg production (Layer)

    C. Dual purpose D. Game fighting

22. Which is a hard epidermal derivative?

    A. Sweat glands B. Sebaceous glands

    C. Claws D. Mucous glands

23. Amphicoelous vertebrae are best suited for .....

A. Limited movement B. Shock absorption

C. Flexibility D. Strong articulation

24. Which adaptation is related to bipedalism?

A. Horizontal vertebral column B. Curvature of spine

C. Increased ribs D. Reduced vertebrae

25. In the evolution of the heart, which group shows the first complete separation of systemic and pulmonary circuits?

A. Amphibians. B. Squamate Reptiles.

C. Crocodilians and Birds. D. Bony Fish.

26. Why is the "Spiral Valve" found in sharks but not in mammals?

A. Mammals have higher metabolic rates and need faster transit.

B. Sharks have a very short intestine; the valve increases surface area without adding length.

C. Sharks lack a liver and need the valve to store bile.

D. Mammals move food using gravity rather than muscle.

27. Assertion: Loss of skin glands in reptiles is an adaptation for water conservation.

Reason: Skin glands increase water loss through evaporation.

A. Both A and R are true, and R is the correct explanation

B. Both A and R are true, but R is NOT the correct explanation

C. A is true, R is false

D. A is false, R is true

28. Which system is MOST affected by habitat shift?

A. Digestive B. Respiratory

C. Nervous D. Skeletal

29. Which group lacks jaws but possesses vertebral column?

A. Pisces B. Amphibia

C. Agnatha D. Reptilia

30. Which class of vertebrates retains both systemic arches?

A. Birds B. Mammals

C. Reptiles D. Amphibians

31. Which feature is most adaptive for water conservation?

A. Gills B. Skin glands

C. Metanephric kidney D. Lateral line

32. If helicase activity is inhibited during replication, which event is most immediately affected?

A. The synthesis of RNA primers by primase.

B. The separation of the two DNA strands.

C. The joining of Okazaki fragments by ligase.

D. The proofreading activity of DNA polymerase.

33. A mutation in the operator region of the lac operon prevents repressor binding. What is the consequence?

A. The operon remains inactive regardless of lactose presence.

B. The structural genes are transcribed continuously.

C. RNA polymerase cannot bind to the promoter.

D. The regulatory gene stops producing repressor protein.

34. Which change would have the least effect on the final protein product?

A. A mutation in a intron region.

B. A frameshift mutation near the start of the gene.

C. A mutation in the start codon.

D. A nonsense mutation in the coding sequence.

35. Which event occurs during transcription but not during DNA replication?

A. Base pairing between nucleotides.

B. Formation of phosphodiester bonds.

C. Use of RNA nucleotides instead of DNA nucleotides.

D. Requirement of a template strand.

36. The 5' cap of eukaryotic mRNA primarily functions to .....

A. Terminate transcription.

B. Protect mRNA from degradation and assist in ribosome binding.

C. Remove introns from pre-mRNA.

D. Facilitate DNA replication.

37. What would be the effect of inhibiting topoisomerase during DNA replication?

A. DNA supercoiling would increase ahead of the replication fork.

B. RNA primers would not be synthesized.

C. DNA polymerase would stop functioning.

D. Hydrogen bonds between bases would break.

38. Why are sticky ends advantageous in cloning compared to blunt ends?

A. They facilitate complementary base pairing between DNA fragments.

B. They prevent ligase from joining DNA fragments incorrectly.

C. They increase the action of T4 DNA ligase for end joining.

D. They inhibit DNA replication of linear DNA in host cells.

39. Southern blotting is meant for transfer of ..... from gel to membrane.

A. RNA B. DNA

C. Protein D. Lipids

40. The Sanger Sequencing uses .....

A. RNA primers B. dideoxynucleotides

C. Restriction enzymes D. Ligase

41. PCR amplification is exponential because .....

A. Each cycle produces two copies from one DNA molecule.

B. DNA polymerase increases in concentration each cycle.

C. Primers replicate independently of DNA.

D. RNA molecules are converted into DNA repeatedly.

42. DNA Microinjection usually results in .....

A. Targeted integration B. Random integration

C. Episomal maintenance D. Homologous recombination

43. Cryopreservation of cells is usually done in .....

A. Liquid Nitrogen (-196°C) B. Deep Freezer (-20°C)

C. Ice bath (0°C) D. Dry ice (-78°C)

44. Which stem cells are "unipotent"?

A. ES cells

B. Skin epidermal stem cells

C. Cord blood cells

D. mesenchymal

45. Assertion (A): Transgenic animals like the cow 'Rosie' are referred to as living bioreactors.

Reason (R): They are engineered to produce human proteins, such as alpha-lactalbumin, which are secreted directly into their milk for easy harvest.

A. (A) is true, but (R) is false.

B. (A) is false, but (R) is true.

C. Both (A) and (R) are true, and (R) is the correct explanation of (A).

D. Both (A) and (R) are true, but (R) is not the correct explanation of (A).

46.

Column I (Method)	Column II (Key Feature/Outcome)
P. DNA Microinjection	1. Uses quiescent (G0) somatic cells for reprogramming
Q. Retroviral Method	2. Random integration into the male pronucleus
R. Nuclear Transplantation	3. Limited by the size of the transgene insert
S. ES Cell-Mediated Transfer	4. Primary method for generating targeted Gene Knockouts

Choose the correct combination

A. P-2, Q-3, R-1, S-4 B. P-2, Q-3, R-4, S-1

C. P-2, Q-4, R-3, S-1 D. P-3, Q-2, R-1, S-4

47. What is the Arithmetic Mean of the dataset 5, 8, 12, 15, 20?

A. 10 B. 12

C. 15 D. 60

48. If the Variance of a biological dataset is 16, what is the Standard Deviation?

A. 4 B. 8

C. 32 D. 256

49. Spearman's Rank Correlation Coefficient is specifically used when data is .....

    A. Distributed normally

    B. Collected from a very large population

    C. Given in ranks or qualitative categories

    D. Negative only

50. Data collected by a researcher directly from a field study on bird nesting habits is classified as .....

    A. Primary data B. Secondary data

    C. Arrayed data D. Tabulated data

51. What is the main purpose of the "Body" of a table?

    A. To contain the actual numerical information/data.

    B. To provide a title to the data.

    C. To explain the abbreviations used.

    D. To list the sources of data.

52. Standing water bodies like lakes and ponds are referred to as .....

    A. Lotic ecosystems B. Lentic ecosystems

    C. Estuarine ecosystems D. Benthic ecosystems

53. An estuary is fundamentally described as .....

    A. A high-altitude freshwater lake

    B. A stagnant deep-sea trench

    C. A transition zone between freshwater and saltwater

    D. A desert oasis

54. The change in sea level that defines the intertidal zone is primarily the result of..

A. Strong oceanic winds

B. Gravitational effects of the moon and sun

C. Underwater earthquakes

D. Tectonic plate shifts

55. Most animals living in deep benthic oceanic waters are .....

A. Primary producers B. Secondary consumers

C. Detritivores D. Autotrophs

56. Domestic sewage rich in organic waste can lead to the death of fish primarily due to .....

A. Increased population of aquatic food web organisms

B. An increased production of fish due to biodegradable nutrients

C. Severe depletion of dissolved oxygen (DO)

D. Algal blooms causing the river to dry quickly

57. Untreated sewage often leads to high counts of which indicator organism to signify fecal contamination?

A. Vibrio cholerae B. Coliform bacteria (e.g., E. coli)

C. Cyanobacteria D. Zooxanthellae

58. As a lake becomes highly eutrophic, what happens to its Biological Oxygen Demand (BOD)?

A. BOD decreases as plants produce more oxygen

B. BOD remains constant regardless of nutrient levels

C. BOD increases due to the high load of decomposing organic matter

D. BOD becomes zero as all life dies

59. Upper course of a stream is characterized by .....

A. Slow flow
B. High velocity
C. High sediment deposition
D. High temperature

60. Carbonates and bicarbonates help in .....

A. Increasing turbidity
B. Buffering pH
C. Reducing oxygen
D. Increasing temperature

61. The transition zone where groundwater and surface water mix beneath a streambed is called the .....

A. Photic zone
B. Hyporheic zone
C. Pelagic zone
D. Littoral zone

62. Insects typically undergo ..... type of cleavage due to their centrolecithal eggs.

A. Radial holoblastic
B. Spiral holoblastic
C. Superficial meroblastic
D. Discoidal meroblastic

63. The morphogenetic movement characterized by the infolding of a sheet of cells into the blastocoel is .....

A. Involution
B. Ingression
C. Invagination
D. Delamination

64. The nervous system and the epidermis of the skin are derived from .....

A. Ectoderm
B. Mesoderm
C. Endoderm
D. Mesendoderm

65. The "Gray Crescent" region on the fate map of Frog, marks the future .....

A. Ventral side
B. Dorsal side
C. Anterior side
D. Endoderm only

66. The resorption of the tadpole tail during metamorphosis is an example of

A. Necrosis B. Autophagy

C. Apoptosis (Programmed cell death) D. Neoplasia

67. Vitellogenesis in birds occurs primarily in the liver. The yolk transported to the growing oocyte .....

A. Via simple diffusion through the body cavity

B. Via the bloodstream as phosphovitin and lipovitellin

C. By direct synthesis within the oocyte nucleus

D. Through the oviductal secretions

68. In the chick blastula (blastoderm), the fluid-filled space between the epiblast and the yolk is called the .....

A. Archenteron B. Proamnion

C. Subgerminal cavity D. Blastocoel

69. The "Chalazae" in the egg serve to .....

A. Provide nutrients to the embryo

B. Keep the yolk centered and the blastodisc facing upwards

C. Form the calcium shell

D. Trigger the start of cleavage

70. At which developmental stage does the human embryo typically implant into the uterine wall?

A. Morula B. Blastocyst

C. Neurula D. Zygote

71. Which of the following does NOT cross the placental barrier under normal conditions?

A. IgG antibodies
B. Oxygen and Carbon dioxide
C. Maternal Red Blood Cells
D. Glucose and Amino acids

72. B lymphocytes are responsible for .....

A. Cell-mediated immunity
B. Humoral immunity
C. Phagocytosis
D. Inflammation

73. Secondary lymphoid organs include .....

A. Bone marrow
B. Thymus
C. Spleen
D. Liver

74. Haptens are .....

A. Complete antigens
B. Non-immunogenic alone
C. Antibodies
D. Enzymes

75. IgG is the .....

A. Largest antibody
B. Mucosal antibody
C. First antibody formed
D. Most abundant antibody

76. Polyclonal antibodies recognize .....

A. Single epitope
B. Multiple epitopes
C. No epitopes
D. Only proteins

77. MHC molecules are important for .....

A. recognition of allergen
B. Antigen presentation
C. alternative pathway of complement activation
D. extravasation of phagocytes

78. Match the Complement Pathway (List I) with its specific Initiator (List II)

List I	List II
A. Classical Pathway	1. C3b binding to microbial surfaces
B. Alternative Pathway	II. Antigen-Antibody complexes (1gM/IgG)
C. Lectin Pathway	III. Mannose-binding protein
D. Membrane Attack Complex	IV. C5b-C9

Choose the correct combination

A. A-II, B-I, C-III, D-IV

B. A-I, B-II, C-IV, D-III

C. A-III, B-I, C-II, D-IV

D. A-II, B-III, C-I, D-IV

79. Match the Cytokine Property (List I) with its Definition (List II)

List I	List II
A. Pleiotropy	I. Multiple cytokines performing the same function
B. Redundancy	II. One cytokine having multiple different effects
C. Synergy	III. Combined effect is greater than additive
D. Antagonism	IV. One cytokine inhibits the action of another

Choose the correct combination

A. A-II, B-III, C-I, D-IV

B. A-I, B-II, C-III, D-IV

C. A-II, B-I, C-III, D-IV

D. A-IV, B-III, C-II, D-I

80. Assertion (A): Type I hypersensitivity reactions are immediate and primarily mediated by IgG antibodies.

Reason (R): Allergens cross-link antibodies bound to the surface of mast cells, leading to degranulation and release of histamine.

A. Both (A) and (R) are true, and (R) is the correct explanation of (A).

B. Both (A) and (R) are true, but (R) is NOT the correct explanation of (A).

C. (A) is true, but (R) is false.

D. (A) is false, but (R) is true.

81. Assertion (A): MHC Class I molecules are expressed on almost all nucleated cells in the body.

Reason (R): MHC Class I molecules present endogenous antigens to (CD8 T-cells, allowing the immune system to monitor endogenous antigens such as viral or tumor proteins.

A. Both (A) and (R) are true, and (R) is the correct explanation of (A).

B. Both (A) and (R) are true, but (R) is NOT the correct explanation of (A).

C. (A) is true, but (R) is false.

D. (A) is false, but (R) is true.

82. Which caste of honey bee is produced through the process of Parthenogenesis?

A. Queen

B. Worker

C. Drone

D. All of the above

83. A "Queen Excluder" is a critical tool in modern beekeeping because it .....

A. Prevents drones from entering the hive and consuming honey.

B. Allows workers to move into the honey supers but prevents the queen from laying eggs there.

C. Keeps the queen from leaving the hive during a swarming event.

D. Protects the queen from external predators like wasps.

84. The antiseptic and antimicrobial properties of honey are largely attributed to its "high osmotic pressure." This means that .....

A. Honey contains high levels of vitamin C.

B. Honey's high sugar concentration draws water out of bacteria, effectively dehydrating and killing them.

C. The wax particles in honey act as a physical barrier against germs.

D. Honey maintains a perfectly neutral pH that prevents bacterial growth.

85. What is the primary biological advantage of using frozen semen in Artificial Insemination over natural service?

A. It eliminates the biological need for the female to undergo an estrus cycle.

B. It allows for the widespread use of germplasm from a single superior sire across vast distances.

C. It guarantees a 100% conception rate regardless of the timing of insemination.

D. It alters the sex ratio of the offspring to ensure only female calves are born.

86. The "Male Effect" (introducing a bull to a group of heifers) is often used in management to induce carly puberty primarily by

A. Increasing the physical exercise of the heifers through social interaction.

B. Triggering the release of pheromones that stimulate the heifer's endocrine system.

C. Forcing the heifers to compete for food, which speeds up metabolic growth.

D. Providing a visual stimulus that alters the heifer's circadian rhythm.

87. In natural pearl formation, the "irritant" acts as a catalyst for which specific cellular response?

A. It triggers the oyster to shed its outer shell to grow a new one.

B. It stimulates the mantle epithelium to fold and form a "pearl sac" around the object.

C. It causes the oyster to produce a toxic chemical to dissolve the intruder.

D. It signals the oyster to enter a dormant state for several years.

88. Which biological characteristic makes Macrobrachium rosenbergii the most preferred species for freshwater aquaculture globally?

A. It is a strictly freshwater species that does not require any salinity during its life cycle.

B. It is the only prawn species that does not exhibit cannibalistic behavior at high densities

C. It exhibits a high growth rate and possesses a euryhaline nature during its larval stages.

D. It has a digestive system capable of processing cellulose without supplemental protein.

89. In a prawn hatchery, "Artemia" nauplii are used as a primary food source for larvae because they .....

A. Can be easily synthesized from chemical precursors in the laboratory.

B. Provide a high-protein, live-moving prey that triggers the predatory strike of the larvae.

C. Are the only organisms that can survive the high-salinity treatment of prawn tanks.

D. Help in cleaning the tank by consuming waste products from the prawn larvae.

90. In the process of hypophysation (induced breeding), what is the primary role of the pituitary gland extract?

A. To increase the oxygen carrying capacity of the fish blood.

B. To temporarily change the water temperature in the breeding hapa.

C. To act as an antibiotic to prevent infections during breeding.

D. To stimulate the release of gonadotropic hormones required for spawning.

91. The Jamunapari breed is highly valued in India primarily for being a .....

A. Fiber breed used exclusively for pashmina production.

B. Dual-purpose breed suitable for both milk and meat.

C. Dwarf breed used only for backyard hobby farming.

D. Breed that can only survive in high-altitude snowy regions.

92. What would happen to the heart's rhythm if the SA node failed and the AV node took over as the primary pacemaker?

A. The heart rate would decrease significantly.

B. The heart would stop beating immediately.

C. The heart rate would increase to dangerous levels.

D. The ventricles would contract before the atria,

93. During the "Diastasis" phase of the cardiac cycle, what is happening to the blood flow?

A. Blood is being forcefully ejected into the Aorta.

B. There is a slow, passive filling of the ventricles from the atria.

C. All blood flow in the heart stops completely.

D. Blood is flowing backward from the arteries into the ventricles.

94. What is the primary function of "Pulmonary Surfactant" produced by Type II alveolar cells?

A. To increase the friction between the lungs and the chest wall.

B. To chemically bind with oxygen to speed up its absorption.

C. To reduce the surface tension of the fluid lining the alveoli, preventing them from collapsing.

D. To act as a filter for dust and bacteria entering the lungs.

95. A "Shift to the Right" in the Oxygen Dissociation Curve indicates that .....

A. Hemoglobin has developed a much higher affinity for oxygen.

B. Hemoglobin is releasing oxygen more easily to the tissues.

C. The lungs are unable to absorb any oxygen from the air.

D. The body temperature has dropped to a dangerously low level.

96. Which of the following is a unique characteristic of Cardiac muscle that distinguishes it from Skeletal muscle?

A. The presence of striations and myofibrils.

B. The ability to contract only under voluntary conscious control.

C. The presence of intercalated discs containing gap junctions for synchronized contraction.

D. The lack of any organized sarcomere structure.

97. The T-tubules (Transverse tubules) are essential for muscle contraction because they .....

A. Provide a direct tunnel for oxygen to enter the mitochondria.

B. Conduct the action potential from the surface membrane deep into the interior of the muscle fiber.

C. Act as a storage site for waste products like lactic acid.

D. Physically pull the thick and thin filaments past each other.

98. What is the primary driving force for "Glomerular Filtration"?

A. The active transport of ions by the tubule cells.

B. The osmotic pressure of the plasma proteins.

C. The high hydrostatic pressure in the glomerular capillaries.

D. The capsular hydrostatic pressure pushing back against the blood.

99. During the Resting Membrane Potential, why is the neuronal membrane described as being "polarized"?

A. Both sides of the membrane have an equal distribution of sodium ions.

B. There is a measurable electrical potential difference across the membrane, with the inside being negative.

C. The membrane allows all ions to pass through freely via simple diffusion.

D. The sodium-potassium pump has ceased all activity.

100. Hormones are often described as "chemical messengers" that exhibit specificity.

This specificity is primarily determined by .....

A. The speed at which the hormone travels through the circulatory system.

B. The presence of specific protein receptors on or within the target cells.

C. The total volume of the hormone secreted by the gland.

D. The physical distance between the gland and the target organ.

❐❐❐

- Rough Work -