Seat No.	

ENT-43
Total No. of Pages : 26

M.Sc. ZOOLOGY
RE-ENTRANCE EXAMINATION-2026
Subject Code : 58719

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Day and Date : Wednesday, 24-06-2026 **Total Marks : 100**
Time : 02.30 p.m. to 04.00 p.m.

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Instructions

1) All questions are compulsory.
2) Each question carries 1 mark.
3) Answers should be marked in the given OMR answer 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.

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1. Euchromatin differs from heterochromatin in that it is .....

A. More condensed and inactive

B. Less condensed and transcriptionally active

C. Located only at centromeres

D. Found only during mitosis

2. The largest mass extinction event occurred during.....

A. Devonian B. Triassic

C. Permian D. Cretaceous

3. Assertion (A): Mitochondria are considered semi-autonomous organelles.

Reason (R): They possess their own DNA and ribosomes.

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 couple has one child with blood group O. What is probability their next child will also be O, assuming both parents are heterozygous?

   A. 1/4 B. 1/2

   C. 1/8 D. 3/4

5. Housefly is considered a mechanical vector because

   A. Pathogen multiplies inside it

   B. It acts as an intermediate host

   C. It only carries pathogens externally

   D. It injects pathogens into blood

6. Match the insect vector (List I) with the specific disease it transmits (List II):

List I (Vector)	List II (Disease)
P. Anopheles mosquito	1. Myiasis
Q. Aedes mosquito	2. Malaria
R. Housefly	3. Plague
S. Rat Flea	4. Dengue

   Choose the correct combination

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

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

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

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

7. How does the rat's heart differ from that of a frog?

   A. The rat heart has a sinus venosus and a truncus arteriosus, whereas the frog heart lacks these structures.

   B. The rat heart features a complete interventricular septum, preventing the mixing of oxygenated and deoxygenated blood.

   C. The rat heart is myogenic and can beat outside the body, whereas the frog heart is purely neurogenic.

   D. The rat heart lacks a pericardium, allowing it to expand much more than the frog heart.

8. Which statement best differentiates pseudocoelom from true coelom?

   A. Pseudocoelom lacks mesodermal lining

   B. Pseudococlom contains fluid for transport

   C. Pseudocoelom supports organ development

   D. Pseudocoelom is evolutionarily most advanced.

9. Which observation would disqualify an organism from being placed in Annelida?

   A. Closed circulatory system

   B. True coelom divided by septa

   C. Chitinous exoskeleton

   D. Segmentally arranged nephridia

10. The "Effective stroke" and "Recovery stroke" are terms associated with the movement of .....

    A. Pscudopodia B. Flagella

    C. Cilia D. Myonemes

11. A drug prevents LH secretion but does not affect FSH. What will be the outcome?

    A. Follicles will not develop

    B. Ovulation will not occur

    C. Estrogen will not be produced

    D. Menstruation will not occur

12. Which cell type is directly responsible for nourishment of developing sperm?

    A. Sertoli cells B. Leydig cells

    C. Spermatogonia D. Interstitial cells

13. Which of the following is a shared mechanism of action between oral contraceptive pills and hormone-releasing IUDs?

    A. Both prevent the physical entry of sperm into the vagina.

    B. Both primarily act by increasing the copper ion concentration in the uterus.

    C. Both alter the quality of cervical mucus to make it hostile/thick for sperm penetration.

    D. Both are considered "barrier" methods of contraception.

14. Which step is irreversible in glycolysis?

    A. Glucose → Glucose-6-phosphate

    B. Glucose-6-phosphate →Fructose-6-bisphosphate

    C. 3-Phosphoglycerate →2-Phosphoglycerate

    D. 1,3 bisphosphoglycerate →3-Phosphoglycerate

15. Competitive inhibition can be overcome by .....

A. Decreasing enzyme concentration

B. Increasing substrate concentration

C. Increasing temperature

D. Adding cofactor

16. Considering the "Type Study" of a Frog, how does the respiratory mechanism change during the transition from water to land (larva to adult)?

A. The frog switches from positive pressure breathing (lungs) to negative pressure breathing (gills).

B. The larva uses gills for external exchange, while the adult relies on a combination of cutaneous, buccal, and pulmonary (positive pressure) respiration.

C. The adult frog's heart becomes four-chambered to separate oxygenated and deoxygenated blood for lung efficiency.

D. Lungs in frogs are more efficient than mammalian lungs because they lack a diaphragm.

17. Agnatha are also known as .....

A. Jawed fishes B. Cartilaginous fishes

C. Jawless vertebrates D. Bony fishes

18. Diseases that naturally spread from vertebrate animals to humans are called.....

A. Epidemic B. Iatrogenic

C. Endemic D. Zoonosis

19. In poultry, "Broilers" are specifically raised for .....

    A. High egg yield. B. Rapid growth and meat.

    C. Feather production. D. Biological control.

20. The "Gram pod borer" (Helicoverpa armigera) is considered a polyphagous pest because it .....

    A. Eats only one type of plant.

    B. Has a very short life cycle.

    C. Feeds on a wide range of host plants

    D. Lacks a larval stage.

21. Which adaptation is most related to terrestrial life?

    A. Thin epidermis

    B. Keratinized outer layer

    C. Mucous glands

    D. Dermal papillae

22. Procoelous vertebrae allow .....

    A. Greater flexibility B. Limited movement

    C. Rigid support D. Fusion of vertebrae

23. Crop in birds primarily functions in .....

    A. Digestion B. Storage

    C. Absorption D. Secretion

24. The "Left Systemic Arch" is lost in which class of vertebrates?

    A. Mammalia. B. Amphibia.

    C. Aves D. Reptilia.

25. The "Bile Duct" enters the duodenum rather than the stomach because.....

    A. Bile is acidic and would neutralize stomach acid.

    B. Bile works best in an alkaline environment to emulsify fats after the stomach's acid work is done.

    C. The stomach is too small to hold bile.

    D. Fats are only found in the intestine.

26. Assertion: Metanephric kidney is most advanced.

    Reason: It is efficient in water conservation.

    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

27. First functional kidney in vertebrates is .....

    A. Metanephros B. Mesonephros

    C. Pronephros D. None

28. Which is NOT a vertebrate trend?

    A. Cephalization B. Segmentation

    C. Radial symmetry D. Bilateral symmetry

29. Which of the following is the MOST advanced feature?

    A. Amphicoelous vertebrae B. Mesonephric kidney

    C. Four-chambered heart D. Gills

30. The Countercurrent exchange mechanism is most efficient in .....

    A. Lungs of mammals B. Gills of fishes

    C. Skin of amphibians D. Trachea of insects

31. A decrease in primase activity during DNA replication would most likely result in .....

    A. impacting the synthesis of lagging strand

    B. The leading strand becoming discontinuous.

    C. DNA polymerase being unable to extend DNA strands.

    D. Helicase failing to unwind the DNA helix.

32. Which condition is required for maximum expression of the lac operon?

    A. Lactose is absent and glucose is present.

    B. Lactose is present and glucose is absent.

    C. Both lactose and glucose are present.

    D. Both lactose and glucose are absent.

33. If the promoter region of a gene is mutated, what is the most likely outcome?

    A. The protein sequence changes without affecting transcription.

    B. Transcription initiation is impaired due to poor RNA polymerase binding.

    C. Translation proceeds normally but replication is affected.

    D. The gene is transcribed but not translated.

34. In eukaryotic cells, which process ensures that only coding regions are expressed?

    A. DNA replication

    B. RNA splicing

    C. Translation

    D. DNA repair

35. During translation, which event ensures the correct amino acid is added to the growing polypeptide chain?

    A. Recognition of codon-anticodon.

    B. Binding of RNA polymerase to DNA.

    C. Formation of hydrogen bonds in DNA.

    D. binding of initiator tRNA in P site.

36. A genomic library differs from a cDNA library in that .....

    A. It contains only expressed genes.

    B. It represents the entire genome including non-coding regions.

    C. It is synthesized from mRNA.

    D. It lacks introns completely.

37. Northern blotting is meant for transfer of bands of ..... from gel to membrane.

    A. DNA B. RNA

    C. Protein D. Carbohydrate

38. Retroviral method of gene transfer uses .....

    A. Bacteria B. Ribosomes

    C. Enzymes D. Virus as vector

39. Post-transcriptional modification does NOT include .....

    A. Splicing

    B. Capping

    C. Polyadenylation

    D. codon-anticodon pairing

40. If the annealing temperature in PCR is too high, what will occur?

A. Primers will bind non-specifically to DNA.

B. DNA strands will not separate during denaturation.

C. Primers will fail to bind efficiently to the template.

D. DNA polymerase will degrade the template.

41. A "Chimeric" animal contains .....

A. cell from two different species

B. Cells from two different embryos

C. Mutated DNA only

D. Extra chromosomes

42. Which agent prevents the formation of ice crystals in the cytoplasm during freezing?

A. Ethanol B. DMSO

C. Formaldehyde D. Methanol

43. Sterilization by Autoclave works on the principle of .....

A. Steam under pressure B. Dry heat

C. Gamma rays D. Chemicals

44. Assertion (A): The creation of a "knockout mouse" depends on homologous recombination in embryonic stem (ES) cells.

Reason (R): Homologous recombination allows for the precise replacement of an endogenous gene with an inactive or mutated version.

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).

45. Column I (Application) Column II (Specific Example/Agent)

P. Pharmaceutical Production	1. Inactivation of a-1,3-galactosyltransferase in pigs
Q. Organ Transplantation	2. a-1-antitrypsin production in sheep milk
R. Disease Modeling	3. Human alpha-lactalbumin in cow milk
S. Nutritional Enhancement	4. Oncomouse for cancer research

Choose the correct combination

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

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

46. Find the Median of the following numbers: 7, 3, 12, 8, 5, 7, 10.

A. 8 B. 5

C. 7 D. 12

47. For the values 12, 15, and 18, the Mean Deviation about the mean is .....

A. 0 B. 2

C. 3 D.6

48. If two variables \(X\) and \(Y\) are completely independent of each other, their Karl Pearson correlation coefficient will be .....

A. +1 B. -1

C. 0.5 D. 0

49. "Blood Group" (A, B, AB, O) is an example of which type of biological variable?

A. Continuous variable B. Discrete variable.

C. Qualitative variable D. Derived variable

50. If you want to compare the "Growth Rate" of two different bacterial strains over 24 hours, which graph is most effective?

    A. Simple Bar Diagram B. Multiple Line Graph

    C. Pie Chart D. Frequency Curve

51. In a stratified lake, the warm upper layer is known as the .....

    A. Hypolimnion B. Metalimnion

    C. Epilimnion D. Thermocline

52. Estuaries are highly productive because they act as an .....

    A. Ecotone between fresh and marine water

    B. Isolated ecosystem with no external nutrients

    C. Area with extremely low salinity

    D. Oligotrophic zone

53. Organisms in the intertidal zone must be adapted to survive .....

    A. Periodic exposure to air and changing salinities

    B. Permanent darkness and high pressure

    C. Constant sub-zero temperatures

    D. A lack of nutrient availability

54. Deep open benthos communities are typically .....

    A. Fully autotrophic

    B. Entirely heterotrophic, relying on organic "snow" from above

    C. High in photosynthetic plants

    D. Located only in warm tropical waters

55. .....is considered a "Non-Point Source" of water pollution?

A. Effluent from a specific textile factory

B. Discharge from an urban outfall sewer

C. Agricultural runoff from a large farming district

D. Discharge from a nuclear power plant's cooling system

56. The phenomenon where massive algal blooms die and decompose, creating areas where no aquatic life can survive, is known as .....

A. The Photic zone B. A Dead zone

C. The Littoral zone D. Oligotrophic state

57. Which nutrient is typically the "limiting factor" for primary productivity and eutrophication in most freshwater lakes?

A. Carbon B. Potassium

C. Phosphorus D. Silicon

58. Hill stream fishes show adaptation like .....

A. Large fins B. Flattened body

C. Air sacs D. Bright colours

59. Dissolved CO_2 in water is important for .....

A. Respiration B. Photosynthesis

C. Digestion D. Movement

60. Which process describes the microbial conversion of ammonium NH_4^+ to nitrate NO_3^- in stream sediments?

A. Nitrification B. Denitrification

C. Ammonification D. Nitrogen fixation

61. The process by which a sperm gains the ability to fertilize an egg within the female reproductive tract is:

    A. Acrosome reaction

    B. Cortical reaction

    C. Capacitation

    D. Syngamy

62. Epiboly is a morphogenetic movement primarily involving .....

    A. Movement of cells to the interior

    B. Migration of individual cells from the

    C. Splitting of one cell layer into two

    D. surface Spreading of ectodermal cells over the surface of the embryo

63. Which of the following is a derivative of the Mesoderm?

    A. Thyroid gland

    B. Lining of the gut

    C. Notochord and circulatory system

    D. Alveoli of lungs

64. .....is the cavity of the gastrula, which becomes the future digestive tract.

    A. Blastocoel B. Coelom

    C. Archenteron D. Neurocoel

65. Which hormone is primarily responsible for triggering metamorphosis in frogs?

    A. Insulin B. Thyroxine

    C. Prolactin D. Estrogen

66. Cleavage in the chick embryo is restricted to the blastodise at the animal pole. This type of cleavage is .....

A. Meroblastic discoidal B. Holoblastic rotational

C. Meroblastic superficial D. Holoblastic unequal

67. The functional equivalent of the amphibian "Dorsal Lip of the Blastopore" in the chick embryo is the .....

A. Area Opaca B. Hensen's Node

C. Koller's Sickle D. Proamnion

68. The regression of the Primitive Streak occurs in ..... direction.

A. Cephalo-caudal (Anterior to Posterior)

B. Caudo-cephalic (Posterior to Anterior)

C. Lateral to Medial

D. Ventral to Dorsal

69. Which part of the blastocyst is responsible for invading the endometrium and secreting hCG?

A. Inner Cell Mass (ICM)

B. Epiblast

C. Trophoblast (Syncytiotrophoblast)

D. Hypoblast

70. Which of the following mammals possesses a "Cotyledonary" placenta, where villi are found in isolated tufts or patches?

A. Elephant B. Deer and Giraffe

C. Rat D. Monkey

71. Adjuvants are used to .....

A. Decrease immunity

B. Enhance immune response

C. Kill cells

D. Reduce antibodies

72. Circulating IgM is .....

A. Monomer B. Dimer

C. Pentamer D. Trimer

73. Antigen-antibody binding is .....

A. Covalent B. Non-covalent

C. Ionic only D. Hydrophobic interaction

74. MHC class I presents antigen to .....

A. B cells B. Helper T cells

C. Cytotoxic T cells D. NK cells

75. The activation of Complement system leads to .....

A. Cell lysis B. Digestion

C. DNA replication D. Mutation

76. Autoimmunity occurs when .....

A. Immune system attacks pathogens

B. Only antibodies act and complements fail to act.

C. No immune response occurs

D. Immune system attacks our own cells

77. Match the Hypersensitivity Type (List I) with its Clinical Example (List II):

List I	**List II**
A. Type I	I. Arthus Reaction / Serum Sickness
B. Type II	II. Anaphylaxis / Asthma
C. Type III	III. Tuberculin Reaction/Contact Dermatitis
D. Type IV	IV. Erythroblastosis Fetalis

Choose the correct combination

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

78. Match the vaccine types in Column I with their immunological characteristics in Column II:

Column I (Vaccine Type)	**Column II (Concept)**
(A) Live attenuated vaccine	(1) Mainly induces humoral immunity; often needs booster doses
(B) Inactivated (killed) vaccine	(2) Strong cellular + humoral immunity; risk in immunocompromised individuals
(C) Subunit/Recombinant vaccine	(3) Contains only antigenic parts; safer but less immunogenic
(D) Toxoid vaccine	(4) Uses inactivated toxin to generate immunity

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

79. Assertion (A): The Alternative pathway of the complement system does not require antibodies for activation.

    Reason (R): It is initiated by the spontaneous hydrolysis of C3 into C3(H2O) in the serum.

    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.

80. Assertion (A): Cytokines generally act over long distances like endocrine hormones.

    Reason (R): Most cytokines have a very short half-life in the circulation.

    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. In a honey bee colony, the development of a larva into a Queen rather than a Worker is primarily determined by .....

    A. The genetic makeup of the egg at fertilization.

    B. The temperature maintained within the brood chamber.

    C. The quality and duration of the nutritional diet (Royal Jelly) provided.

    D. The type of pheromones released by the drones during mating.

82. The "Newton" and "Langstroth" hive models are both based on the concept of "Bee Space." This concept refers to .....

A. The distance between the hive and the nearest floral source.

B. The specific gap (approx. 6-9mm) that bees leave open for movement without sealing it with wax or propolis.

C. The total acreage required for a single apiary to be successful.

D. The volume of the queen's chamber relative to the worker chamber.

83. Assertion (A): The worker bee, despite being female, is incapable of mating or laying fertilized eggs under normal hive conditions.

Reason (R): The Queen bee secretes "Queen Mandibular Pheromone" (QMP) which suppresses the ovarian development of the worker bees.

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.

84. For maximal conception rates in cattle, the most critical factor regarding Artificial Insemination is .....

A. The age of the technician performing the procedure.

B. Inseminating the cow specifically during "standing heat" or mid-estrus.

C. Ensuring the cow is fed a high-protein diet exactly two hours before the procedure.

D. Performing the procedure only during the winter months to preserve the semen.

85. From an economic perspective, why is "Feeding" considered the most critical "pillar" of livestock management?

A. It is the only factor that the farmer can change on a daily basis.

B. Domestic animals refuse to mate if they are not fed premium grain.

C. High-quality feed completely eliminates the need for any veterinary care.

D. Feed costs typically account for 70-80% of the total cost of milk production.

86. What is the fundamental difference between natural and "cultured" (artificial) pearl formation?

A. Cultured pearls are produced by dead oysters, whereas natural pearls come from living ones.

B. Cultured pearls are made of plastic, while natural pearls are made of calcium.

C. Natural pearls only form in freshwater, while cultured pearls only form in saltwater.

D. Natural pearls form by accident, while cultured pearls involve the deliberate surgical insertion of a nucleus and graft tissue.

87. When selecting a site for a freshwater prawn farm, why is "Water Hardness" considered a critical limiting factor?

A. High calcium levels in very hard water are reported to significantly reduce the growth rate of prawns.

B. Hard water prevents the prawns from absorbing oxygen through their gills.

C. Soft water causes the pond bottom to become overly acidic, killing the larvae.

D. Extremely hard water prevents the formation of the exoskeleton after moulting.

88. Why must freshwater prawn larvae be kept in brackish water?

A. Because they require specific salinity to survive their early life stages.

B. To prevent them from swimming too fast.

C. To make the water clearer for feeding.

D. To prevent the adults from eating them.

89. ..... is commonly used as a more effective alternative to raw pituitary extract in modern fish breeding.

A. Formaldehyde

B. Ovaprim

C. Potassium Permanganate

D. Sodium Chloride

90. Why is "Elevated Slotted Flooring" often recommended for goat housing?

A. To keep the goats away from the sight of predators outside.

B. To allow manure and urine to fall through, keeping the floor dry and reducing disease risk.

C. To prevent the goats from jumping over the walls of the shed.

D. To ensure the goats stay as cold as possible during the summer months.

91. The "Syncytium" nature of cardiac muscle allows the impulse to spread rapidly because of .....

A. The large distance between individual musele cells.

B. High-resistance barriers that slow down the electrical signal.

C. Gap junctions that allow ions to flow directly between cells.

D. Specialized nerves that wrap around every single muscle fiber.

92. If an ECG shows a P wave but it is not followed by a QRS complex, what does this suggest about the heart's conduction?

    A. The SA node is not firing at all.

    B. The ventricles are repolarizing too slowly.

    C. There is a blockage in the signal between the atria and the ventricles.

    D. The heart is pumping too much blood with each beat.

93. In what form is the majority (approximately 70%) of Carbon Dioxide transported in the human blood?

    A. As bicarbonate ions in the plasma.

    B. Bound to the heme group of haemoglobin as carbaminohemoglobin.

    C. As dissolved gas directly in the plasma.

    D. As solid carbon crystals attached to white blood cells.

94. According to the "Bohr Effect," which of the following conditions in the tissues will cause haemoglobin to release more oxygen?

    A. Low temperature and high pH.

    B. High CO2 concentration and lower (acidic) pH.

    C. Very high oxygen concentration and low CO2.

    D. Decreased levels of 2,3-DPG in the blood.

95. Smooth muscles are often called "involuntary" muscles because they.....

    A. are controlled by the autonomic nervous system rather than the somatic nervous system.

    B. do not contain actin or myosin filaments.

    C. can only contract when they are physically stretched by external force.

    D. lack a nucleus and cannot undergo cellular repair.

96. According to the "Sliding Filament Theory," what actually shortens during a muscle contraction?

A. The individual actin and myosin filaments.

B. The total length of the thick myosin filament.

C. The distance between the Z-discs (the Sarcomere).

D. The molecular structure of the protein titin.

97. The "Podocytes" found in the visceral layer of the Bowman's capsule function to .....

A. Contract and squeeze blood through the glomerulus.

B. Form filtration slits that allow only small molecules and water to pass.

C. Secretion of Erythropoietin to stimulate red blood cell production.

D. Actively pump sodium into the capsular space.

98. Why is synaptic transmission considered "unidirectional"?

A. The axon is physically wider than the dendrite.

B. The myelin sheath acts as a one-way valve for ions.

C. Electrical charges can only flow in a clockwise direction in biological systems.

D. Neurotransmitter receptors are exclusively located on the post-synaptic membrane.

99. Which biochemical element is essential for the synthesis of Thyroxine by the follicular cells of the thyroid?

A. Calcium B. Iron

C. Iodine D. Magnesium

100. Diabetes Mellitus (Type 1) is primarily caused By .....

A. The overproduction of glucagon by the liver.

B. An autoimmune destruction of the Beta cells, leading to an absolute deficiency of insulin.

C. A lack of iodine in the diet affecting the pancreas.

D. The inability of the kidneys to filter glucose from the blood.

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