

Roll No. ....

Question Booklet Number

O. M. R. Serial No.

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**M. Sc. (Second Semester)  
(NEP) EXAMINATION, 2025-26**

**ZOOLOGY**

**(Animal Physiology and Biochemistry)**

Paper Code							
B	0	5	0	8	0	2	T

Questions Booklet  
Series

**B**

Time : 1:30 Hours ]

[ Maximum Marks : 75

**Instructions to the Examinee :**

1. Do not open the booklet unless you are asked to do so.
2. The booklet contains 100 questions. Examinee is required to answer 75 questions in the OMR Answer-Sheet provided and not in the question booklet. All questions carry equal marks.
3. Examine the Booklet and the OMR Answer-Sheet very carefully before you proceed. Faulty question booklet due to missing or duplicate pages/questions or having any other discrepancy should be got immediately replaced.

**परीक्षार्थियों के लिए निर्देश :**

1. प्रश्न-पुस्तिका को तब तक न खोलें जब तक आपसे कहा न जाए।
2. प्रश्न-पुस्तिका में 100 प्रश्न हैं। परीक्षार्थी को 75 प्रश्नों को केवल दी गई OMR आन्सर-शीट पर ही हल करना है, प्रश्न-पुस्तिका पर नहीं। सभी प्रश्नों के अंक समान हैं।
3. प्रश्नों के उत्तर अंकित करने से पूर्व प्रश्न-पुस्तिका तथा OMR आन्सर-शीट को सावधानीपूर्वक देख लें। दोषपूर्ण प्रश्न-पुस्तिका जिसमें कुछ भाग छपने से छूट गए हों या प्रश्न एक से अधिक बार छप गए हों या उसमें किसी अन्य प्रकार की कमी हो, तो उसे तुरन्त बदल लें।

(Remaining instructions on the last page)

(शेष निर्देश अन्तिम पृष्ठ पर)

***(Only for Rough Work)***

1. The pH of a neutral solution at 25°C is :
  - (A) 0
  - (B) 5
  - (C) 7
  - (D) 14
2. The universal energy currency of the cell is :
  - (A) DNA
  - (B) ATP
  - (C) NADP
  - (D) Glucose
3. Glycolysis occurs in the :
  - (A) Mitochondria
  - (B) Nucleus
  - (C) Cytosol
  - (D) Ribosome
4. The end product of aerobic glycolysis is :
  - (A) Lactate
  - (B) Pyruvate
  - (C) Ethanol
  - (D) Acetyl-CoA
5. How many ATP molecules are net gained in glycolysis ?
  - (A) 2
  - (B) 4
  - (C) 36
  - (D) 38
6. Oxidative phosphorylation takes place in the :
  - (A) Outer mitochondrial membrane
  - (B) Inner mitochondrial membrane
  - (C) Matrix
  - (D) Cytoplasm
7. Which of the following is a polysaccharide ?
  - (A) Glucose
  - (B) Sucrose
  - (C) Cellulose
  - (D) Fructose
8. Fatty acids are broken down into Acetyl-CoA via :
  - (A) Alpha-oxidation
  - (B) Beta-oxidation
  - (C) Gamma-oxidation
  - (D) Glycolysis

9. The “Carnitine Shuttle” is required for :
- (A) Transport of glucose
  - (B) Transport of long-chain fatty acids into mitochondria
  - (C) Protein synthesis
  - (D) Urea cycle
10. Ketone bodies are synthesized primarily in the :
- (A) Brain
  - (B) Muscles
  - (C) Liver
  - (D) Kidneys
11. Which of the following is a “Ketone body” ?
- (A) Acetone
  - (B) Acetoacetate
  - (C)  $\beta$ -hydroxybutyrate
  - (D) All of the above
12. Saturated fatty acids contain :
- (A) Only single bonds
  - (B) One double bond
  - (C) Many double bonds
  - (D) Triple bonds
13. The main storage form of lipids in animals is :
- (A) Phospholipids
  - (B) Triglycerides
  - (C) Cholesterol
  - (D) Glycolipids
14. Glycogen is a polymer of :
- (A) Fructose
  - (B) Galactose
  - (C) Glucose
  - (D) Amino acids
15. The breakdown of glycogen is called :
- (A) Glycogenesis
  - (B) Glycogenolysis
  - (C) Gluconeogenesis
  - (D) Glycolysis
16. Bioenergetics is the study of :
- (A) Life cycles
  - (B) Energy transformations in living organisms
  - (C) Biodiversity
  - (D) Population growth
17. Buffers are substances that :
- (A) Increase pH rapidly
  - (B) Decrease pH rapidly
  - (C) Resist changes in pH
  - (D) Neutralize all acids

18. Which molecule acts as the final electron acceptor in the Electron Transport Chain ?
- (A) CO<sub>2</sub>
  - (B) H<sub>2</sub>O
  - (C) O<sub>2</sub>
  - (D) NAD<sup>+</sup>
19. Lecithin is an example of a :
- (A) Carbohydrate
  - (B) Protein
  - (C) Phospholipid
  - (D) Wax
20. Unsaturated fatty acids are usually ..... at room temperature.
- (A) Solid
  - (B) Liquid
  - (C) Gaseous
  - (D) Crystalline
21. The linkage between two monosaccharides is a :
- (A) Peptide bond
  - (B) Glycosidic bond
  - (C) Phosphodiester bond
  - (D) Hydrogen bond
22. A “Coupled Reaction” is one where :
- (A) Two proteins bind
  - (B) An exergonic reaction drives an endergonic one
  - (C) Two cells fuse
  - (D) An enzyme is inhibited
23. Gluconeogenesis is the synthesis of glucose from :
- (A) Glycogen
  - (B) Starch
  - (C) Non-carbohydrate precursors
  - (D) Lactose
24. The TCA cycle (Krebs Cycle) occurs in the :
- (A) Mitochondrial matrix
  - (B) Cytosol
  - (C) Lysosome
  - (D) ER
25. Excessive production of ketone bodies leads to :
- (A) Alkalosis
  - (B) Ketosis/Acidosis
  - (C) Hyperglycemia
  - (D) Hemolysis

26. Enzymes increase the rate of reaction by lowering :
- (A) Gibbs free energy
  - (B) Activation energy
  - (C) Enthalpy
  - (D) Entropy
27. The “Lock and Key” model of enzyme action was proposed by :
- (A) Emil Fischer
  - (B) Koshland
  - (C) Michaelis
  - (D) Menten
28. Non-protein organic components required by enzymes for activity are :
- (A) Apoenzymes
  - (B) Isozymes
  - (C) Holoenzymes
  - (D) Coenzymes
29. An inhibitor that competes with the substrate for the active site is a/an :
- (A) Non-competitive inhibitor
  - (B) Competitive inhibitor
  - (C) Uncompetitive inhibitor
  - (D) Allosteric inhibitor
30. The  $K_m$  value (Michaelis constant) represents :
- (A) Maximum velocity
  - (B) Substrate concentration at  $1/2 V_{max}$
  - (C) Total enzyme concentration
  - (D) Rate of reaction
31. Proteins are polymers of :
- (A) Nucleotides
  - (B) Fatty acids
  - (C) Amino acids
  - (D) Monosaccharides
32. The primary structure of a protein is held together by :
- (A) Hydrogen bonds
  - (B) Peptide bonds
  - (C) Disulfide bridges
  - (D) Ionic bonds
33. An alpha-helix is an example of which protein structure ?
- (A) Primary
  - (B) Secondary
  - (C) Tertiary
  - (D) Quaternary

34. Which of the following is a secondary metabolite ?
- (A) Glucose
  - (B) ATP
  - (C) Alkaloids
  - (D) Alanine
35. The active site of an enzyme is :
- (A) The entire surface
  - (B) A specific region where the substrate binds
  - (C) The part made of lipids
  - (D) Always at the C-terminus
36. Ribozymes are :
- (A) RNA molecules with catalytic activity
  - (B) DNA enzymes
  - (C) Protein complexes
  - (D) Digestive enzymes
37. Denaturation of proteins involves the loss of :
- (A) Primary structure only
  - (B) Secondary, tertiary, and quaternary structure
  - (C) Peptide bonds
  - (D) Amino acid sequence
38. Isoenzymes are enzymes that :
- (A) Have the same structure but different functions
  - (B) Catalyze the same reaction but have different molecular forms
  - (C) Are inactive precursors
  - (D) Work only at high temperatures
39. Alkaloids are generally :
- (A) Basic nitrogenous compounds
  - (B) Acidic sugars
  - (C) Neutral lipids
  - (D) Simple gases
40. The overall 3D shape of a single polypeptide chain is its :
- (A) Primary structure
  - (B) Secondary structure
  - (C) Tertiary structure
  - (D) Quaternary structure
41. Feedback inhibition is a type of :
- (A) Irreversible inhibition
  - (B) Allosteric regulation
  - (C) Competitive inhibition
  - (D) Denaturation

42. Which amino acid is known for having a sulfur atom ?
- (A) Glycine  
(B) Cysteine  
(C) Valine  
(D) Lysine
43. Terpenoids are derived from :
- (A) Isoprene units  
(B) Glucose  
(C) Ammonia  
(D) Fatty acids
44. Prosthetic groups are :
- (A) Loosely bound cofactors  
(B) Tightly bound non-protein groups  
(C) Active enzymes  
(D) Inactive inhibitors
45. The “Induced Fit” model suggests that :
- (A) The active site is rigid  
(B) The active site changes shape to fit the substrate  
(C) Substrates are destroyed by enzymes  
(D) Enzymes work only in pairs
46. Collagen is a type of :
- (A) Globular protein  
(B) Fibrous protein  
(C) Enzyme  
(D) Hormone
47. Which factor does NOT affect enzyme activity ?
- (A) pH  
(B) Temperature  
(C) Substrate concentration  
(D) Atmospheric nitrogen
48. A zymogen is :
- (A) An active enzyme  
(B) An inactive precursor of an enzyme  
(C) A coenzyme  
(D) A type of RNA
49. Hemoglobin, consisting of four subunits, exhibits :
- (A) Primary structure  
(B) Secondary structure  
(C) Tertiary structure  
(D) Quaternary structure
50. Nomenclature of enzymes usually ends with the suffix :
- (A) -ose  
(B) -ase  
(C) -ine  
(D) -ic

51. Which enzyme is responsible for the initial digestion of starches in the mouth ?
- (A) Pepsin
  - (B) Salivary Amylase
  - (C) Trypsin
  - (D) Lipase
52. The process of blood cell formation is known as :
- (A) Hemolysis
  - (B) Haemopoiesis
  - (C) Phagocytosis
  - (D) Coagulation
53. Which protein is primarily responsible for oxygen transport in the blood ?
- (A) Albumin
  - (B) Myoglobin
  - (C) Hemoglobin
  - (D) Fibrinogen
54. The “pacemaker” of the heart is the :
- (A) AV node
  - (B) Purkinje fibers
  - (C) SA node
  - (D) Bundle of His
55. During muscle contraction, which ion is released from the sarcoplasmic reticulum ?
- (A) Na<sup>+</sup>
  - (B) K<sup>+</sup>
  - (C) Ca<sup>2+</sup>
  - (D) Mg<sup>2+</sup>
56. Structural and functional unit of a skeletal muscle is the :
- (A) Sarcomere
  - (B) Myofibril
  - (C) Fascicle
  - (D) Myofilament
57. Bile salts are essential for the digestion of :
- (A) Proteins
  - (B) Carbohydrates
  - (C) Lipids
  - (D) Nucleic acids
58. Which of the following is a “respiratory pigment” found in molluscs ?
- (A) Hemoglobin
  - (B) Hemocyanin
  - (C) Hemerythrin
  - (D) Chlorocruorin

59. The volume of air inspired or expired during a normal breath is :
- (A) Residual Volume
  - (B) Vital Capacity
  - (C) Tidal Volume
  - (D) Total Lung Capacity
60. The conversion of prothrombin to thrombin requires :
- (A) Vitamin K
  - (B) Vitamin C
  - (C) Calcium ions
  - (D) Both (A) and (C)
61. Pepsinogen is converted to active pepsin by :
- (A) Enterokinase
  - (B) HCl
  - (C) Bile
  - (D) Gastrin
62. In the cardiac cycle, "systole" refers to :
- (A) Relaxation
  - (B) Contraction
  - (C) Filling
  - (D) Pausing
63. Which part of the brain contains the primary respiratory centers ?
- (A) Cerebellum
  - (B) Thalamus
  - (C) Medulla Oblongata
  - (D) Hypothalamus
64. The sliding filament theory explains the mechanism of :
- (A) Nerve impulse
  - (B) Blood clotting
  - (C) Muscle contraction
  - (D) Digestion
65. Which cells secrete Hydrochloric Acid (HCl) in the stomach ?
- (A) Chief cells
  - (B) G-cells
  - (C) Goblet cells
  - (D) Parietal (Oxyntic) cells
66. T-tubules in muscle fibers help in :
- (A) ATP synthesis
  - (B) Protein storage
  - (C) Rapid conduction of action potentials
  - (D) Myosin binding

67. The P-wave in an ECG represents :
- (A) Ventricular depolarization
  - (B) Atrial depolarization
  - (C) Ventricular repolarization
  - (D) Atrial repolarization
68. Which of the following is an anticoagulant naturally found in blood ?
- (A) Heparin
  - (B) Histamine
  - (C) Serotonin
  - (D) Fibrin
69. Chylomicrons are involved in the transport of :
- (A) Amino acids
  - (B) Glucose
  - (C) Dietary lipids
  - (D) Iron
70. Carbon dioxide is primarily transported in the blood as :
- (A) Dissolved gas
  - (B) Carbaminohemoglobin
  - (C) Bicarbonate ions
  - (D) Carbonic acid
71. The exchange of gases between the blood and the alveoli occurs via :
- (A) Active transport
  - (B) Simple diffusion
  - (C) Osmosis
  - (D) Facilitated diffusion
72. The “Lub” sound of the heart is caused by :
- (A) Closing of semilunar valves
  - (B) Opening of AV valves
  - (C) Closing of AV valves
  - (D) Filling of ventricles
73. Which muscle type is non-striated and involuntary ?
- (A) Skeletal
  - (B) Cardiac
  - (C) Smooth
  - (D) All of the above
74. Trypsinogen is activated by :
- (A) Pepsin
  - (B) Enterokinase
  - (C) Steapsin
  - (D) Amylopsin

75. The Bohr effect describes the relationship between :
- (A) CO<sub>2</sub> and O<sub>2</sub> affinity of hemoglobin
  - (B) Temperature and heart rate
  - (C) Glucose and insulin
  - (D) pH and enzyme activity
76. The functional unit of the kidney is the :
- (A) Neuron
  - (B) Nephron
  - (C) Alveoli
  - (D) Osteon
77. Which mechanism allows the kidney to produce concentrated urine ?
- (A) Simple filtration
  - (B) Counter-current mechanism
  - (C) Active secretion
  - (D) Osmosis
78. The junction between two neurons is called a/an :
- (A) Node of Ranvier
  - (B) Synapse
  - (C) Dendrite
  - (D) Axon hillock
79. Which hormone increases water reabsorption in the collecting ducts ?
- (A) Oxytocin
  - (B) Insulin
  - (C) Antidiuretic Hormone (ADH)
  - (D) Adrenaline
80. The resting membrane potential of a neuron is typically around :
- (A) + 30 mV
  - (B) 0 mV
  - (C) - 70 mV
  - (D) - 100 mV
81. "Flight or Fight" response is mediated by :
- (A) Insulin
  - (B) Epinephrine
  - (C) Thyroxine
  - (D) Melatonin
82. The master gland of the endocrine system is the :
- (A) Thyroid
  - (B) Adrenal
  - (C) Pituitary
  - (D) Pancreas

83. Neurotransmitters are stored in :
- (A) Dendrites
  - (B) Synaptic vesicles
  - (C) Myelin sheath
  - (D) Nucleus
84. Which hormone regulates calcium levels in the blood ?
- (A) Thyroxine
  - (B) Parathyroid Hormone (PTH)
  - (C) Cortisol
  - (D) Glucagon
85. The maintenance of a constant internal body temperature is :
- (A) Thermoregulation
  - (B) Homeostasis
  - (C) Acclimatization
  - (D) Metabolism
86. Saltatory conduction occurs in :
- (A) Non-myelinated neurons
  - (B) Dendrites
  - (C) Muscle fibers
  - (D) Myelinated neurons
87. Which part of the eye is responsible for color vision ?
- (A) Rods
  - (B) Cones
  - (C) Iris
  - (D) Sclera
88. The “Organ of Corti” is associated with :
- (A) Vision
  - (B) Smell
  - (C) Hearing
  - (D) Equilibrium
89. Which hormone is secreted by the Pineal gland ?
- (A) Melatonin
  - (B) MSH
  - (C) Prolactin
  - (D) Aldosterone
90. The primary nitrogenous waste in humans is :
- (A) Ammonia
  - (B) Uric acid
  - (C) Urea
  - (D) Creatinine
91. Action potential is characterized by the rapid influx of :
- (A)  $K^+$
  - (B)  $Na^+$
  - (C)  $Cl^-$
  - (D)  $Mg^{2+}$

92. Acclimatization to high altitudes involves an increase in :
- (A) Red blood cells
  - (B) White blood cells
  - (C) Platelets
  - (D) Plasma volume
93. Steroid hormones exert their action by :
- (A) Binding to surface receptors
  - (B) Entering the nucleus and affecting gene expression
  - (C) Activating cAMP
  - (D) Opening ion channels
94. Which organ acts as both an exocrine and endocrine gland ?
- (A) Liver
  - (B) Spleen
  - (C) Pancreas
  - (D) Thymus
95. The "Comfort Zone" refers to the range of environmental temperature where :
- (A) Body temperature rises
  - (B) Shivering occurs
  - (C) No energy is spent on thermoregulation
  - (D) Sweating is maximum
96. What is the function of the Iris?
- (A) Regulates the size of the pupil
  - (B) Refracts light
  - (C) Protects the eye
  - (D) Sharpens the image
97. The process of maintaining the body's salt and water balance is :
- (A) Dialysis
  - (B) Osmoregulation
  - (C) Hydrolysis
  - (D) Thermogenesis
98. Glucagon is secreted by :
- (A) Alpha cells of pancreas
  - (B) Beta cells of pancreas
  - (C) Delta cells of pancreas
  - (D) F-cells
99. The gap in the myelin sheath is called :
- (A) Synapse
  - (B) Node of Ranvier
  - (C) Axon terminal
  - (D) Neurilemma
100. Which structure in the ear maintains dynamic equilibrium ?
- (A) Cochlea
  - (B) Semicircular canals
  - (C) Eustachian tube
  - (D) Ossicles

***(Only for Rough Work)***

4. Four alternative answers are mentioned for each question as—A, B, C & D in the booklet. The candidate has to choose the correct answer and mark the same in the OMR Answer-Sheet as per the direction :

**Example :**

**Question :**

Q. 1 (A) ● (C) (D)

Q. 2 (A) (B) ● (D)

Q. 3 (A) ● (C) (D)

Illegible answers with cutting and over-writing or half filled circle will be cancelled.

5. Each question carries equal marks. Marks will be awarded according to the number of correct answers you have.
6. All answers are to be given on OMR Answer Sheet only. Answers given anywhere other than the place specified in the answer sheet will not be considered valid.
7. Before writing anything on the OMR Answer Sheet, all the instructions given in it should be read carefully.
8. After the completion of the examination candidates should leave the examination hall only after providing their OMR Answer Sheet to the invigilator. Candidate can carry their Question Booklet.
9. There will be no negative marking.
10. Rough work, if any, should be done on the blank pages provided for the purpose in the booklet.
11. To bring and use of log-book, calculator, pager and cellular phone in examination hall is prohibited.
12. In case of any difference found in English and Hindi version of the question, the English version of the question will be held authentic.

**Impt. :** On opening the question booklet, first check that all the pages of the question booklet are printed properly. If there is any discrepancy in the question Booklet, then after showing it to the invigilator, get another question Booklet of the same series.

4. प्रश्न-पुस्तिका में प्रत्येक प्रश्न के चार सम्भावित उत्तर—A, B, C एवं D हैं। परीक्षार्थी को उन चारों विकल्पों में से सही उत्तर छँटना है। उत्तर को OMR आन्सर-शीट में सम्बन्धित प्रश्न संख्या में निम्न प्रकार भरना है :

**उदाहरण :**

**प्रश्न :**

प्रश्न 1 (A) ● (C) (D)

प्रश्न 2 (A) (B) ● (D)

प्रश्न 3 (A) ● (C) (D)

अपठनीय उत्तर या ऐसे उत्तर जिन्हें काटा या बदला गया है, या गोले में आधा भरकर दिया गया, उन्हें निरस्त कर दिया जाएगा।

5. प्रत्येक प्रश्न के अंक समान हैं। आपके जितने उत्तर सही होंगे, उन्हीं के अनुसार अंक प्रदान किये जायेंगे।
6. सभी उत्तर केवल ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर ही दिये जाने हैं। उत्तर-पत्रक में निर्धारित स्थान के अलावा अन्यत्र कहीं पर दिया गया उत्तर मान्य नहीं होगा।
7. ओ. एम. आर. उत्तर-पत्रक (OMR Answer Sheet) पर कुछ भी लिखने से पूर्व उसमें दिये गये सभी अनुदेशों को सावधानीपूर्वक पढ़ लिया जाये।
8. परीक्षा समाप्ति के उपरान्त परीक्षार्थी कक्ष निरीक्षक को अपनी OMR Answer Sheet उपलब्ध कराने के बाद ही परीक्षा कक्ष से प्रस्थान करें। परीक्षार्थी अपने साथ प्रश्न-पुस्तिका ले जा सकते हैं।
9. निगेटिव मार्किंग नहीं है।
10. कोई भी रफ कार्य, प्रश्न-पुस्तिका के अन्त में, रफ-कार्य के लिए दिए खाली पेज पर ही किया जाना चाहिए।
11. परीक्षा-कक्ष में लॉग-बुक, कैलकुलेटर, पेजर तथा सेल्युलर फोन ले जाना तथा उसका उपयोग करना वर्जित है।
12. प्रश्न के हिन्दी एवं अंग्रेजी रूपान्तरण में भिन्नता होने की दशा में प्रश्न का अंग्रेजी रूपान्तरण ही मान्य होगा।

**महत्वपूर्ण :** प्रश्नपुस्तिका खोलने पर प्रथमतः जाँच कर देख लें कि प्रश्न-पुस्तिका के सभी पृष्ठ भलीभाँति छपे हुए हैं। यदि प्रश्नपुस्तिका में कोई कमी हो, तो कक्षनिरीक्षक को दिखाकर उसी सिरीज की दूसरी प्रश्न-पुस्तिका प्राप्त कर लें।