Booklet Series

B

No. of Printed Pages : 16

Serial Number of the Test Booklet

623104

PAPER CODE

PAPER/II-06/ZOOLOGY

B

Roll No. : _____

Name of the Candidate : _____

Test Duration : 03 Hours ***Total Questions : 100*** ***Total Maximum Marks : 200***

INSTRUCTIONS TO CANDIDATES

1. Candidates will be admitted to the Examination Hall/Room on production of their Admit Card and Original ID such as **EPIC/Aadhaar/Driving License** with a view to establish the true identity of the candidate.
2. Candidates shall reach the venue of examination at least 30 minutes in advance and admission will be refused to a candidate who is late by 10 minutes from the start of the examination.
3. No candidate shall be permitted to leave the Examination Hall/Room until the time for the examination is over or until permitted to do so but not until the half of the allotted time.
4. Candidates must use a **BLUE/BLACK** ball point pen ONLY to make entries on the OMR Answer Sheet.
5. The candidates should not bring any articles (other than those specified above) such as books, notes, loose sheets, mobile phones, pagers, digital diaries, calculators, smart watches, etc. inside the Examination Hall/Room. Any candidate found in possession of the said articles will be liable to be de-barred from applying all future examinations to be conducted by the Board.
6. After receiving the Test Booklet with OMR inserted, the candidates may pull out the OMR Answer Sheet and fill in the necessary details. However the candidates are not allowed to break open the seal of the Test Booklet until the invigilator informs them to do so.
7. Mark carefully your Roll Number, Question Booklet Code and Booklet Series on the OMR Answer Sheet and append signature at the appropriate place. Write your Roll Number and **Name in the Question Booklet**. In the absence of the Roll Number and Question Booklet Series on the OMR Answer Sheet, it may NOT be evaluated.
8. The entire Test is of Objective Type Questions comprising 100 questions.
9. Candidates must check that the Question Booklet contains 100 multiple choice questions. If any discrepancy found, report to the invigilator immediately.
10. Every question carries a total of 2 marks each. Candidates will also keep in mind that there is negative marking of $1/3^{rd}$ for every wrong answer.
11. Rough work may be done on the space provided in this Question Booklet, but not on the OMR Answer Sheet.
12. In the event of a mistake made in marking the Roll Number in the OMR Answer Sheet or the OMR Series the candidates will not be given a new OMR Answer Sheet but he/she will be allowed to use whitener or correcting fluid for correction of the Roll Number and the Booklet Series only.
13. **Change of answer will not be permitted in the OMR Answer Sheet. Using of correcting fluid (of any sort) will be treated as wrong attracting negative marking.**
14. The candidates must abide by such instructions as may be specified on the cover of the Answer Paper or instructions to candidates given at the back of the Admit Card. If a candidate fails to do so or indulges in improper conduct, he/she will render himself/herself liable to expulsion from the examination or such other punishment as the Board deemed fit to impose.
15. At the end of the Test, candidates must submit the OMR Answer Sheet to the invigilator on duty. Candidates shall be allowed to take their Question Booklet only after the end of the examination session.
16. Any candidate found to be intoxicated with alcohol and/or psychotropic substances will be expelled from the Examination Hall/Room.
17. Examination centre once opted cannot be changed.

PLEASE REFER THE BACKSIDE OF THE QUESTION BOOKLET FOR MORE INSTRUCTIONS.

SEAL

1. **Assertion (A)**: DNA can replicate itself without the involvement of enzymes.

Reason (R): Hydrogen bonds between the strands are weak and break easily, allowing replication.

(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

2. What is the second stage in the expression of a gene's information ?

(A) Transcription

(B) Splicing

(C) Replication

(D) Translation

3. All monosaccharides are

(A) Non-reducing sugars

(B) Reducing sugars

(C) Tasteless

(D) Insoluble in water

4. In which material is cellulose found in almost pure form (98%) ?

(A) Cotton fibres

(B) Flax

(C) Wood

(D) Jute

5. Which type of regeneration involves stem cells regenerating lost organs or tissues ?

(A) Stem-cell mediated regeneration

(B) Epimorphosis

(C) Morphallaxis

(D) Compensatory regeneration

6. Which type of regeneration involves repatterning of existing tissues with little new growth ?

(A) Morphallaxis

(B) Epimorphosis

(C) Stem-cell mediated regeneration

(D) Compensatory regeneration

7. What determines where cleavage can occur and the relative size of the blastomeres ?

(A) The size of the zygote

(B) The amount and distribution of yolk

(C) The number of sperm that fertilized the egg

(D) The temperature of the environment

8. Delamination results in which of the following ?

(A) Formation of a new sheet of cells

(B) Cells migrating independently into the embryo

(C) The outer layer spreading over the internal cells

(D) The enclosure of deeper embryo layers

9. What type of fatty acid derivatives are generated from α-oxidation ?

(A) Even-carbon fatty acids

(B) Branched-chain fatty acids

(C) Odd-carbon fatty acids

(D) Aromatic fatty acids

10. What connects the insect head to the thorax ?

(A) A rigid sclerite

(B) A jointed exoskeleton

(C) A muscular hinge

(D) A flexible membranous neck

11. In prokaryotic cells, DNA is usually

(A) Contained within a membrane-bound nucleus

(B) Scattered randomly outside the cell

(C) Not housed within a well-defined nucleus

(D) Stored in lysosomes

12. What is the term for the pairing of homologous chromosomes ?

(A) Mitosis (B) Fusion

(C) Synapsis (D) Cytokinesis

13. Which of the following is commonly called an angler fish, frog fish or devil fish ?

(A) Lophius (B) Hippocampus

(C) Squalus (D) Raja

14. Which genus of lungfish is the earliest recorded fossil ?

(A) *Ceratodus*

(B) *Dipterus*

(C) *Protopterus*

(D) None of the above

15. At neutral pH, what is the charge on the free carboxyl group of an amino acid ?

(A) Positive (B) Zero

(C) Neutral (D) Negative

16. Which amino acid is technically considered an imino acid rather than a typical α-L-amino acid ?

(A) Glycine (B) Methionine

(C) Lysine (D) Proline

17. Where does extracellular digestion occur in the body ?

(A) Within individual cells

(B) In the liver

(C) In extracellular body cavities like the lumen of the stomach or intestines

(D) In the kidneys

18. In humans, absorption is defined as

(A) Breaking down of complex molecules

(B) Transfer of digestive products to lymph or blood

(C) Excretion of undigested food

(D) Production of enzymes

19. How many amino acids are in the β-globin polypeptide ?
(A) 146
(B) 100
(C) 64
(D) 120

20. What are alternate forms of genes responsible for ?
(A) Environmental mutations
(B) Chromosome replication
(C) Trait differences
(D) DNA sequencing errors

21. What is the product formed when an amino acid reacts with neutralized formaldehyde ?
(A) Hydroxy acid
(B) Ruhemann's purple
(C) Keto acid
(D) Dimethylol amino acid

22. Decarboxylation of amino acids results in the formation of
(A) Amines
(B) Hydroxyacids
(C) Alcohols
(D) Ketones

23. What is the main energy source in the grazing food chain ?
(A) Living plant biomass
(B) Animal waste
(C) Detritus
(D) Decomposers

24. What does the term 'nutrient cycling' primarily refers to ?
(A) Movement of animals across habitats
(B) Transport and transformation of elements in ecosystems
(C) Formation of new elements
(D) Recycling of plastic and waste

25. Pure triacylglycerols are
(A) Bitter and acidic
(B) Tasteless, odourless, colourless and neutral
(C) Salty and alkaline
(D) Sweet and fragrant

26. What is the name of the process in which fat is hydrolyzed using an alkali ?
(A) Hydrogenation
(B) Emulsification
(C) Saponification
(D) Esterification

27. Oligosaccharides are made up of how many monosaccharides units ?
(A) 1 (B) 2 – 10
(C) 11 – 20 (D) More than 20

28. Polysaccharides are generally
(A) Sweet in taste and soluble in water
(B) Sweet in taste and insoluble in water
(C) Tasteless and insoluble in water
(D) Tasteless and soluble in water

29. Neoteny refers to

(A) Early development of gonads

(B) Retention of larval features or trait in the adult body

(C) Transformation of adults into larvae

(D) Rapid metamorphosis

30. What is the common name of *Python molurus* in India ?

(A) Cobra

(B) Krait

(C) Viper

(D) Ajgar

31. What is one of the most important events in the transition from fertilization to cleavage ?

(A) Activation of DNA repair mechanisms

(B) Activation of Mitosis-Promoting Factor (MPF)

(C) Formation of the blastocyst

(D) Completion of meiosis II

32. When is Mitosis-Promoting Factor (MPF) activity highest in early blastomeres ?

(A) During S phase

(B) During interphase

(C) During G1 phase

(D) During M phase

33. What is the role of messenger RNA (mRNA) ?

(A) Carry activated amino acids

(B) Carry genetic information from DNA to protein synthesis sites

(C) Serve as a structural component of ribosomes

(D) Process immature RNA

34. At which wavelength can the denaturation of DNA be monitored using a spectrophotometer ?

(A) 280 nm (B) 300 nm

(C) 260 nm (D) 200 nm

35. What technique is used in the second method of demonstrating transcription termination ?

(A) *In vivo* transcription

(B) Real-time PCR

(C) Reverse transcription

(D) *In vitro* transcription

36. In *in vitro* transcription, what type of Radioactive RNA template is used ?

(A) Well-characterized DNA

(B) Artificially synthesized RNA

(C) mRNA extracted from cells

(D) Plasmid fragments

37. What is the main characteristic of the order Edentata ?

(A) Sharp teeth with enamel

(B) Completely toothless or degenerated teeth without enamel

(C) Carnivorous diet

(D) Presence of horns

38. Which of the following is a general term used for carbohydrates ?

(A) Proteins

(B) Lipids

(C) Saccharides

(D) Nucleotides

39. Match the liver development structures with their function.

Column A (Structure)	Column B (Function)
1. Lateral endodermal cells	a. Exclusively form liver cells
2. Ventromedial endodermal cells	b. Contribute to both liver and midgut regions
3. Mesenchyme	c. Induces endoderm to proliferate and branch
4. Hepatic diverticulum	d. Functions as liver drainage duct

(A) 1 – b, 2 – a, 3 – d, 4 – c

(B) 1 – a, 2 – b, 3 – c, 4 – d

(C) 1 – c, 2 – d, 3 – a, 4 – b

(D) 1 – d, 2 – c, 3 – b, 4 – a

40. What happens when surfactant-stimulated macrophages are injected into the uteri of female mice ?

(A) It delays labor

(B) It induces early labor

(C) It prevents prostaglandin production

(D) It decreases immune system activity

41. What type of linkage connects the monomers in carbohydrate polymers ?

(A) Peptide bond

(B) Ester linkage

(C) Glycosidic (C-O-C) linkage

(D) Phosphodiester bond

42. Ribose and deoxyribose are constituent of

(A) Lipids

(B) Enzymes

(C) Proteins

(D) Nucleic acids

43. What is the role of the chorioallantoic membrane in chickens ?

(A) It stores metabolic waste inside the egg

(B) It transports calcium from the eggshell to the embryo for bone production

(C) It provides a protective barrier against pathogens

(D) It helps absorb nutrients from the yolk

44. What is regeneration ?

(A) The growth of an embryo from a fertilized egg

(B) The reactivation of development in postembryonic life to restore missing tissues

(C) The process of aging in living organisms

(D) The formation of new species through evolution

45. What does the labrum form in insects ?

(A) Upper lip

(B) Tongue

(C) Lower jaw

(D) None of the above

46. Which modified mouthpart do dragonfly larvae use to capture prey ?

(A) Mandibles

(B) Labrum

(C) Maxillae

(D) Labium

47. Match the common dogfish name with its scientific name.

Column A	Column B
a. European spotted dogfish	1. *Scyliorhinus caniculus*
b. Spiny dogfish	2. *Squalus acanthias*
c. Indian dogfish	3. *Scoliodon*
d. Smooth dogfish	4. *Mustelus*

(A) a – 2, b – 1, c – 4, d – 3

(B) a – 1, b – 2, c – 3, d – 4

(C) a – 1, b – 4, c – 2, d – 3

(D) a – 4, b – 3, c – 2, d – 1

48. Which of the following species of rays has a whip-like tail with stings ?

(A) Eagle rays

(B) Electric rays

(C) Manta rays

(D) Skates

49. What term do we use today for Mendel's "hereditary factors" ?

(A) Genes

(B) Alleles

(C) Chromosomes

(D) None of the above

50. **Assertion (A)**: DNA is a double-stranded helical molecule.

Reason (R): The strands of DNA are linked together by peptide bonds between bases.

(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

51. What structural feature is formed by RNA base pairing within a GC-rich region ?

(A) Hairpin

(B) Bulge

(C) Loop

(D) Kink

52. What revealed the inaccuracy of *in vitro* transcription of lambda phage DNA ?

(A) DNA gel electrophoresis

(B) Hybridization of RNA to both DNA strands

(C) Western blotting

(D) Polymerase chain reaction

53. Which fatty acid is monounsaturated ?

(A) Stearic acid

(B) Linolenic acid

(C) Oleic acid

(D) None of the above

54. Brassinolide was first isolated in 1979 from

(A) Wheat pollen

(B) Maize leaves

(C) Rape (Brassica napus) pollen

(D) Soybean seeds

55. What are the two main regions of an insect ovariole ?

(A) Germarium and oviduct

(B) Germarium and vitellarium

(C) Follicle and germline

(D) Euplasm and chorion

56. The optic lobes in insects are lateral extensions of which part of the brain ?

(A) Protocerebrum

(B) Cerebellum

(C) Ganglion

(D) None of the above

57. The smallest fish, Philippine goby (Pandaka) measures only

(A) 10 mm long

(B) 15 meters long

(C) 35 meters long

(D) 120 meters long

58. Which marine animal reaches a length of 15 meters and mentioned as the second biggest vertebrate ?

(A) Gigantic blue whale

(B) Great white shark

(C) Elephant seal

(D) Whale shark

59. What are glycans conjugated with proteins and peptides called ?

(A) Glycolipids

(B) Glucosaminoglycans

(C) Hemicelluloses

(D) Proteoglycans

60. Lipids are insoluble in water but soluble in

(A) Alcohol

(B) Non-polar solvents like hexane and chloroform

(C) Salt solutions

(D) Acids

61. Which order does the seahorse (*Hippocampus*) belongs to ?

(A) Perciformes

(B) Characiformes

(C) Cypriniformes

(D) Syngnathiformes

62. What is the function of the brood pouch found on the belly of the male seahorse ?

(A) To store food

(B) To incubate eggs

(C) To help in swimming

(D) To protect the tail

63. What is released into the synaptic cleft during synaptic transmission ?

(A) Sodium ions

(B) Electrical signals

(C) Neurotransmitters

(D) Hormones

64. Where are sperm produced in the male reproductive system ?

(A) Epididymis

(B) Vas deferens

(C) Coiled seminiferous tubules

(D) Urethra

65. Genes that are altered by the occurrence of mutations are called

(A) Recombinant genes

(B) Neutral genes

(C) Transcribed genes

(D) Mutant genes

66. What does the β-globin polypeptide do ?

(A) Stores genetic information

(B) Forms part of the cell membrane

(C) Is a component of hemoglobin that carries oxygen in the blood

(D) Produces energy in the mitochondria

67. How many living genera of lung fish exist today ?

(A) 1

(B) 2

(C) 3

(D) 4

68. Which type of scale is characteristic of elasmobranch fishes ?

(A) Cycloid scales

(B) Ganoid scales

(C) Ctenoid scales

(D) Placoid scales

69. Until the 1940s, which two molecules were debated as carriers of genetic information ?

(A) Lipids and Proteins

(B) Carbohydrates and Proteins

(C) RNA and DNA

(D) DNA or Proteins

70. What are the two forms of *Streptococcus pneumoniae* studied by Frederick Griffith ?

(A) R and S

(B) P and Q

(C) X and Y

(D) A and B

71. What is an example of compensatory regeneration ?

(A) Planarian flatworm regeneration

(B) Hydra regeneration

(C) Limb regrowth in amphibians

(D) Liver regeneration in mammals

72. What is a more efficient method to separate transcriptional units ?

(A) Transcription termination signals at their ends

(B) Promoter duplication

(C) Electrophoresis

(D) Ribosome binding sites

73. What lies between the sperm nucleus and the acrosomal vesicle in many species ?

(A) Microtubules

(B) Ribosomes

(C) Mitochondria

(D) Globular actin proteins

74. What surrounds the mammalian egg in addition to the zona pellucida ?

(A) Cumulus layer

(B) Mitochondria

(C) Acrosome

(D) Plasma membrane

75. What are the three main parts of an insect's antenna ?

(A) Coxa, trochanter, femur

(B) Scape, pedicel, flagellum

(C) Head, thorax, abdomen

(D) Labrum, mandible, labium

76. The antenna is pivoted at a single marginal point called the

(A) Epicranial ridge

(B) Antennifer

(C) Tentorium

(D) Subocular sulcus

77. Which two groups of animals are both descendants of reptilian species ?

(A) Mammals and amphibians

(B) Fish and amphibians

(C) Reptiles and amphibians

(D) Birds and mammals

78. **Assertion (A)**: Mammalian embryos undergo gastrulation movements similar to those of birds and reptiles.

Reason (R): Mammals lay eggs with large amounts of yolk, just like birds and reptiles.

(A) Both (A) and (R) are true and (R) correctly explains (A)

(B) Both (A) and (R) are true, but (R) does not correctly explain (A)

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

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

79. Which is the largest Indian pitless viper ?

(A) *Echis carinata*

(B) *Python molurus*

(C) *Ancistrodon himalayanus*

(D) *Vipera russelli*

80. *Ancistrodon himalayanus*, the brown Himalayan pit viper of India grows up to

(A) 30 cm (B) 50 cm

(C) 70 cm (D) 100 cm

81. The enzyme that catalyzes the hydrolysis of triacylglycerol is

(A) Amylase

(B) Protease

(C) Lipase

(D) Peptidase

82. Hydrolytic rancidity results in the formation of

(A) Soap

(B) Water

(C) Mono and diacylglycerol

(D) Peroxides

83. What is the primary problem faced by a land-dwelling egg ?

(A) Desiccation

(B) Predation

(C) Lack of oxygen

(D) Temperature regulation

84. How does the chorion function in birds and reptiles ?

(A) It stores waste products

(B) It adheres to the shell and enables gas exchange

(C) It secretes amniotic fluid

(D) It produces nutrients for the embryo

85. What is blocked when the repressor binds to the trp operator ?

(A) DNA replication

(B) tRNA synthesis

(C) Ribosome binding

(D) RNA polymerase access to the promoter

86. Which organism is specifically mentioned in regulating DAHP synthetase ?

(A) *Escherichia coli*

(B) *Saccharomyces cerevisiae*

(C) *Bacillus subtilis*

(D) *Mycobacterium tuberculosis*

87. Who created the phylum chordata ?

(A) Darwin

(B) Linnaeus

(C) Balfour

(D) Lamarck

88. What is the meaning of 'chorde' in Greek ?

(A) Bone

(B) Support

(C) Backbone

(D) String or cord

89. What are the primary components of cell membranes ?

(A) DNA and RNA

(B) Glucose and cellulose

(C) Lipids and proteins

(D) Water and salts

90. What material composes plant cell walls ?

(A) Cellulose

(B) Keratin

(C) Murein

(D) Peptidoglycan

91. What percentage of nitrogen fixation in prokaryotic organisms is carried out by biological means ?

(A) 50%

(B) 10%

(C) 25%

(D) 90%

92. What does population density represent ?

(A) The migration rate of individuals

(B) The energy consumption of a species

(C) The size of a population per unit area or volume

(D) The lifespan of individuals in a population

93. What is the scientific study of bony fishes called ?

(A) Zoology

(B) Entomology

(C) Marine Biology

(D) Ichthyology

94. What is the primary distribution area of the genus Labeo ?

(A) Temperate regions of the world

(B) Tropical Africa and East Indies

(C) Arctic and Antarctic regions

(D) Australia and New Zealand

95. What structure on the principal cells increases the surface area for absorption ?

(A) Microvilli

(B) Flagella

(C) Cilia

(D) Villi

96. In which insect order do two fully winged stages occur ?

(A) Ephemeroptera

(B) Diptera

(C) Lepidoptera

(D) Coleoptera

97. Which amino acid makes up over 40% of fibroin in *Bombyx mori* ?

(A) Glycine

(B) Glutamine

(C) Serine

(D) None of the above

98. In social Hymenoptera larvae, when is fecal matter excreted ?

(A) After every meal

(B) At every molt

(C) Continuously during development

(D) Only at the larva–pupa molt

99. What is the structure called when both amino and carboxyl groups of an amino acid are ionized ?

(A) Isoelectric structure

(B) Amphipathic form

(C) Zwitterion

(D) Hydrophobic form

100. Which of the following amino acids is not chiral ?

(A) Glycine

(B) Alanine

(C) Serine

(D) Valine