

DO NOT OPEN THIS TEST BOOKLET UNTIL YOU ARE ASKED TO DO SO

Test Booklet No. :

Series

00381 TEST BOOKLET
BIOLOGY AND GENERAL STUDIES



Time Allowed : 2 Hours

Full Marks : 200

Read the following instructions carefully before you begin to answer the questions :

1. The name of the Subject, Roll Number as mentioned in the Admission Certificate, Test Booklet No. and Series are to be written legibly and correctly in the space provided on the Answer-Sheet with Black/Blue ballpoint pen.
2. **Answer-Sheet without marking Series as mentioned above in the space provided for in the Answer-Sheet shall not be evaluated.**
3. All questions carry equal marks.

The Answer-Sheet should be submitted to the Invigilator.

Directions for giving the answers : Directions for answering questions have already been issued to the respective candidates in the 'Instructions for marking in the OMR Answer-Sheet' along with the Admit Card and Specimen Copy of the OMR Answer-Sheet.

Example :

Suppose the following question is asked :

The capital of Bangladesh is

- (A) Chennai
(B) London
(C) Dhaka
(D) Dhubri

You will have four alternatives in the Answer-Sheet for your response corresponding to each question of the Test Booklet as below :



In the above illustration, if your chosen response is alternative (C), i.e., Dhaka, then the same should be marked on the Answer-Sheet by blackening the relevant circle with a Black/Blue ballpoint pen only as below :



The example shown above is the only correct method of answering.

4. Use of eraser, blade, chemical whitener fluid to rectify any response is prohibited.
5. Please ensure that the Test Booklet has the required number of pages (16) and 100 questions immediately after opening the Booklet. In case of any discrepancy, please report the same to the Invigilator.
6. No candidate shall be admitted to the Examination Hall/Room 20 minutes after the commencement of the examination.
7. **No candidate shall leave the Examination Hall/Room** without prior permission of the Supervisor/Invigilator. No candidate shall be permitted to hand over his/her Answer-Sheet and leave the Examination Hall/Room before expiry of the full time allotted for each paper.
8. No Mobile Phone, Electronic Communication Device, etc., are allowed to be carried inside the Examination Hall/Room by the candidates. Any Mobile Phone, Electronic Communication Device, etc., found in possession of the candidate inside the Examination Hall/Room, even if on off mode, shall be liable for confiscation.
9. No candidate shall have in his/her possession inside the Examination Hall/Room any book, notebook or loose paper, except his/her Admission Certificate and other connected papers permitted by the Commission.
10. Complete silence must be observed in the Examination Hall/Room. No candidate shall copy from the paper of any other candidate, or permit his/her own paper to be copied, or give, or attempt to give, or obtain, or attempt to obtain irregular assistance of any kind.
11. This Test Booklet can be carried with you after answering the questions in the prescribed Answer-Sheet.
12. Noncompliance with any of the above instructions will render a candidate liable to penalty as may be deemed fit.
13. No rough work is to be done on the OMR Answer-Sheet. You can do the rough work on the space provided in the Test Booklet.

N.B. : There will be negative marking @ 0.25 per 1 (one) mark against each wrong answer.

/61-A

[No. of Questions : 100]

SEAL

1. The inner membrane of a mitochondrion has infoldings called _____ that increase its surface area for ATP production.
 - (A) cristae
 - (B) endoplasmic reticulum
 - (C) ribosomes
 - (D) Golgi apparatus

2. The acrosome of the sperm is formed from the
 - (A) endoplasmic reticulum
 - (B) Golgi apparatus
 - (C) lysosome
 - (D) peroxisomes

3. In dark-field microscopy, light is scattered by the specimen, resulting in
 - (A) a bright background with dark objects
 - (B) a dark background with bright objects
 - (C) colored images of the specimen
 - (D) increased magnification compared to bright-field

4. Hybridoma technology involves the fusion of
 - (A) T lymphocytes and B lymphocytes
 - (B) macrophages and dendritic cells
 - (C) plasma cells and red blood cells
 - (D) neutrophils and eosinophils

5. In forensic science, SEM can be used to analyze
 - (A) blood spatter patterns
 - (B) bullet striations and markings on firearms
 - (C) DNA evidence
 - (D) toxicology samples

6. Which checkpoint in the cell cycle ensures DNA replication is completed before mitosis begins?
 - (A) G1 checkpoint
 - (B) G2 checkpoint
 - (C) M checkpoint
 - (D) There are no checkpoints

7. The Kastle-Meyer test is a presumptive test for blood that detects the presence of
 - (A) hemoglobin
 - (B) ABO blood group antigens
 - (C) Rh factor
 - (D) DNA

8. Antibodies belong to the class of molecules called
 - (A) carbohydrates
 - (B) lipids
 - (C) proteins
 - (D) nucleic acids

9. Which enzyme is a common marker for the presence of semen in forensic examinations?
- (A) Lipase
 - (B) Amylase
 - (C) Acid phosphatase (AP)
 - (D) Lactate dehydrogenase (LDH)
10. The Bombay blood group is also known as
- (A) hh phenotype
 - (B) universal recipient
 - (C) B positive
 - (D) AB positive
11. The term 'forensic' is derived from which language?
- (A) English
 - (B) Greek
 - (C) Latin
 - (D) French
12. What type of biological evidence is analyzed in forensic palynology?
- (A) Hair
 - (B) Pollen and spores
 - (C) Blood
 - (D) Bone fragments
13. Which body fluid is the primary source of alpha-amylase enzyme?
- (A) Saliva
 - (B) Blood
 - (C) Semen
 - (D) Urine
14. Which feature of hair can be used to differentiate between human and animal hair in some cases?
- (A) Colour
 - (B) Length
 - (C) Root structure
 - (D) Medullary pattern
15. The rings observed in the cross-section of a tree trunk represent
- (A) annual growth cycles
 - (B) seasonal changes
 - (C) disease patterns
 - (D) insect damage
16. The principle behind sterilization in an autoclave involves
- (A) chemical denaturation of proteins
 - (B) desiccation (drying) of micro-organisms
 - (C) coagulation of proteins by high temperature steam
 - (D) disruption of cell walls by pressure
17. Identifying diatoms from forensic samples requires
- (A) simple chemical tests
 - (B) advanced DNA profiling techniques
 - (C) microscopic examination
 - (D) differential bloodstain analysis

18. The study of insects and other arthropods associated with a dead body to determine elapsed time since death is called
- (A) forensic pathology
 - (B) forensic odontology
 - (C) forensic entomology
 - (D) forensic anthropology
19. A body buried deep underground will likely experience
- (A) a rapid succession of insect colonization
 - (B) a slower and delayed insect succession
 - (C) a unique set of insect species not found above ground
 - (D) It will not affect insect succession
20. DNA analysis of body fluids is primarily used for
- (A) identifying the blood type
 - (B) individual identification
 - (C) determining the cause of death
 - (D) detecting the presence of drug
21. A cell line refers to
- (A) a primary culture of cells directly isolated from an organism
 - (B) a population of cells derived from a primary culture that can be propagated indefinitely under controlled conditions
 - (C) a specialized type of cell found in specific tissues
 - (D) a group of viruses infecting a particular cell type
22. The title of 'first transgenic insect' is attributed to which insect species?
- (A) Honeybee (*Apis mellifera*)
 - (B) Housefly (*Musca domestica*)
 - (C) Diamondback moth (*Plutella xylostella*)
 - (D) Fruit fly (*Drosophila melanogaster*)
23. Ti plasmid stands for
- (A) tissue-infecting plasmid
 - (B) tumor-inducing plasmid
 - (C) transmissible island plasmid
 - (D) transferable inheritance plasmid
24. Southern blotting is a technique used to detect specific
- (A) proteins
 - (B) carbohydrates
 - (C) DNA sequences
 - (D) lipids
25. The technique used to create Dolly Sheep (First transgenic mammal) is called
- (A) parthenogenesis
 - (B) nuclear transfer
 - (C) in vitro fertilization
 - (D) artificial insemination

26. Stem cells are characterized by their ability to
- (A) perform specialized functions
 - (B) self-renew and differentiate into other cell types
 - (C) secrete large amounts of hormones
 - (D) have a short lifespan
27. Which is the correct order from strongest to weakest bond?
- (A) Ionic bond > covalent bond > hydrogen bond > van der Waals interaction
 - (B) Ionic bond > hydrogen bond > covalent bond > van der Waals interaction
 - (C) Covalent bond > ionic bond > hydrogen bond > van der Waals interaction
 - (D) Hydrogen bond > ionic bond > covalent bond > van der Waals interaction
28. T-DNA, also known as the transfer DNA, is a crucial component of
- (A) replication in bacterial cells
 - (B) viral genomes
 - (C) human chromosomes
 - (D) mitochondrial DNA
29. Bt corn (maize) is often genetically modified to express proteins that are toxic to
- (A) fungi
 - (B) herbicides
 - (C) viruses
 - (D) caterpillar larvae
30. What is the full form of CRISPR?
- (A) Coded Repetitive Sequences for Identifying Pathogens
 - (B) Clustered Regularly Interspaced Short Palindromic Repeats
 - (C) Cellular Recognition System for Internal Parasites
 - (D) Cyclic Regulatory Sequences for Inducing Protein Synthesis
31. The nitrogenous bases in DNA are divided into two categories—purines and pyrimidines. Examples of purines include
- (A) adenine (A) and thymine (T)
 - (B) adenine (A) and guanine (G)
 - (C) cytosine (C) and uracil (U)
 - (D) guanine (G) and thymine (T)
32. Towards which electrode is DNA migrated in gel electrophoresis?
- (A) Cathode electrode
 - (B) Anode electrode
 - (C) Randomly migrate
 - (D) No movement based on electric charge
33. Who is widely recognized as the father of DNA profiling?
- (A) H. J. Khorana
 - (B) Alec Jeffreys
 - (C) Kary Mullis
 - (D) E. M. Southern

- 34.** What is the full form of IUCN?
- Indian Union and Committee of Nature
 - International Union for Conservation of Nature and Natural Resources
 - International United Convention on Nature
 - International Union for Conserving Natural Environment
- 35.** A cesium chloride will separate DNA based on
- absorption
 - resorption
 - density
 - adhesion
- 36.** By which technique can the monozygotic twins be individualized?
- DNA fingerprinting (autosomal)
 - Mitochondrial DNA analysis
 - X-STR analysis
 - Fingerprint
- 37.** The Wildlife (Protection) Act was enacted in India in which year?
- 1952
 - 1962
 - 1972
 - 1980
- 38.** PCR (Polymerase Chain Reaction) is a technique used to
- cut DNA at specific locations
 - amplify specific DNA sequences
 - separate DNA fragments by size
 - identify the blood type from a bloodstain
- 39.** Confirmation of menstrual bloodstain is done by which method?
- Isoenzyme marker
 - DNA hybridization
 - Restriction enzyme
 - Fibrin Degradation Product (FDP)
- 40.** Short Tandem Repeat (STR) analysis is a commonly used technique for
- sequencing entire genomes
 - identifying individual based on specific DNA markers
 - visualizing chromosomes under a microscope
 - detecting mutations in genes
- 41.** Which of the following methods uses dideoxynucleotide triphosphates (ddNTPs) to terminate DNA strand elongation?
- Maxam-Gilbert sequencing
 - Sanger sequencing
 - Next-generation sequencing
 - Pyrosequencing

42. Genetic genealogy is most helpful for tracing ancestry on which side of the family?
- Maternal only
 - Paternal only
 - Both maternal and paternal
 - Neither maternal nor paternal
43. What is the full form of NABL?
- National Accreditation Board for Laboratories
 - National Authority for Biological Testing
 - National Association of Biomedical Laboratories
 - None of the above
44. How many numbers of chromosome pairs are present in man?
- 46
 - 23
 - 36
 - 32
45. Which of the following is **not** a common source of biological evidence for DNA isolation in forensics?
- White blood cells
 - Semen
 - Tissue scrapping
 - Red blood cells
46. What is the main slogan of the National IPR Policy?
- "Digital India"
 - "Make in India"
 - "Creative India; Innovative India"
 - "Skill India"
47. What was the primary purpose of the DNA Bill in India?
- To regulate genetic modification of crops
 - To establish a DNA data bank for identification purposes
 - To provide funding for DNA research projects
 - To ban the use of DNA testing in paternity suits
48. DNA profiling pattern can be found identical in
- father and child
 - fraternal twins
 - identical twins
 - two brothers
49. For the examination of vomit, which materials are to be taken into account?
- Presence of mucus
 - Free HCl
 - Endothelial cells
 - All of the above
50. What do you mean by cDNA?
- Circular DNA
 - Coiled DNA
 - Cytoplasmic DNA
 - Complementary DNA

51. Who wrote the National Anthem of Assam?
- (A) Lakshminath Bezbarua
 - (B) Birendranath Dutta
 - (C) Ambikagiri Raichoudhury
 - (D) Jyoti Prasad Agarwala
52. Which of the following is known as State fruit of Assam?
- (A) Bhut Jolokia
 - (B) Kaji Nemu
 - (C) Litchi
 - (D) Thekera Tenga (*Garcinia*)
53. Who received 'Player of the Tournament' in ICC World Cup 2023?
- (A) Mohammed Shami
 - (B) Riyan Parag
 - (C) Virat Kohli
 - (D) M. S. Dhoni
54. *Moro Eta Sapon Ase* is the autobiography by
- (A) Rubul Mout
 - (B) Anuradha Sharma Pujari
 - (C) Nilmani Phookan
 - (D) Arupa Patangia
55. What is the motto of G20 2023?
- (A) Atma Deepo Bhava
 - (B) One Earth, One Family, One Future
 - (C) Atmanirbhar Bharat
 - (D) Jai Jawan, Jai Kisan, Jai Vigyan, Jai Anusandhan
56. The vaccine against which of the following diseases can be taken orally?
- (A) Covid-19
 - (B) Poliomyelitis
 - (C) Malaria
 - (D) Japanese encaphalitis

57. Who is known as the 'Hargila Baideu' of Assam?
- (A) Purnima Devi Barman
(B) Pratibha Barua
(C) Hima Das
(D) Kanaklata Barua
58. Which of the following movies received National Film Award for feature film in Assamese in 2023?
- (A) *Anur*
(B) *Boomba Ride*
(C) *Kothanodi*
(D) *Village Rockstar*
59. Which place in India is called 'Manchester of East'?
- (A) Shillong
(B) Sivasagar
(C) Sualkuchi
(D) Arunachal Pradesh
60. On which date, India's Chandrayaan-3 landed on the moon?
- (A) 1st August, 2023
(B) 23rd August, 2023
(C) 15th August, 2023
(D) 28th August, 2023
61. Who is known as the 'Millet Man of India'?
- (A) Khader Vali
(B) Upendra Rabha
(C) Jadav Payeng
(D) Venkat Iyer
62. The pattern of NEP India 2023 is
- (A) 10+2+3+2
(B) 5+3+3+4
(C) 3+2+4+4
(D) 5+5+2+4
63. The first modern Olympic was held in
- (A) Italy
(B) London
(C) Athens
(D) Rome
64. Which of the following is known as 'Peacock Island' of Assam?
- (A) Majuli
(B) Umananda
(C) Borsapori
(D) Nimati Ghat

65. Bangalore city is known as
- (A) Garden city
 - (B) City of joy
 - (C) City of lakes
 - (D) Blue city
66. Assam Startup—The Nest is situated in
- (A) Ambari, Guwahati
 - (B) Dispur, Guwahati
 - (C) Panjabari, Guwahati
 - (D) Boragaon, Guwahati
67. From Ahom regime, 'The Battle of Saraigat' was led by
- (A) Lachit Borphukan
 - (B) Rudra Singha
 - (C) Chaolung Sukapha
 - (D) Biswa Singha
68. Which of the following is known as the 'heritage land of golden threads'?
- (A) Assam
 - (B) Karnataka
 - (C) China
 - (D) Japan
69. The holy songs written by Mahapurush Srimanta Sankardev are known as
- (A) Holi Geet
 - (B) Bargeet
 - (C) Lokageet
 - (D) Bhaona
70. The first Covid-19 vaccine developed by India is known as
- (A) Covaxin
 - (B) Covishield
 - (C) AstraZeneca
 - (D) Covovax

71. Which is the smallest taxon among taxonomic categories?
- (A) Genus
 - (B) Species
 - (C) Order
 - (D) Family
72. Metamerism is the characteristic feature of
- (A) arthropods
 - (B) molluscs
 - (C) annelids
 - (D) mammals
73. If a fruit is formed without fertilization of the ovary, it is called
- (A) parthenocarpic fruit
 - (B) monocot
 - (C) dicot
 - (D) embryo
74. Stomata are composed of
- (A) guard cells
 - (B) trichomes
 - (C) phloem
 - (D) companion cell
75. Direction of movement of materials in the phloem is
- (A) upward
 - (B) downward
 - (C) unidirectional
 - (D) bidirectional
76. Which of the following hormones is essential for fruit ripening?
- (A) Ethylene
 - (B) Abscisic acid
 - (C) Gibberellins
 - (D) Auxin
77. The function of restriction endonuclease is
- (A) to cut DNA at specific sites
 - (B) to identify mutation
 - (C) to introduce DNA to the host
 - (D) to manipulate genome
78. In which phase of the cell cycle, DNA synthesis occurs?
- (A) S phase
 - (B) G₁ phase
 - (C) G₀ phase
 - (D) G₂ phase

79. What is the infective stage of malaria parasite?
- (A) Sporozoite
 - (B) Gametocytes
 - (C) Merozoites
 - (D) Mosquito
80. Diabetes mellitus is related to which of the following hormones?
- (A) Glucagon
 - (B) Insulin
 - (C) Vasopressin
 - (D) Oxytocin
81. Drugs that prevent an enzyme's binding site from a substrate are known as
- (A) messengers
 - (B) poisons
 - (C) inhibitors
 - (D) receptors
82. A disaccharide is formed when two monosaccharides are bonded together by a bond
- (A) glycosidic
 - (B) peptide
 - (C) ionic
 - (D) phosphodiester
83. What is an example of camphor in N_2 gas?
- (A) Solid in gas solution
 - (B) Gas in gas solution
 - (C) Solid in liquid solution
 - (D) Liquid in gas solution
84. A cathode and an anode are the most common components of an electro-chemical cell. Which of the following claims about the cathode is correct?
- (A) Oxidation occurs at cathode
 - (B) Electrons move into cathode
 - (C) Usually denoted by a negative sign
 - (D) Is usually made up of insulating material

85. What is created by the reaction of natural gas and steam in the Haber-Bosch process?
- (A) Ammonia
 - (B) Nitrogen
 - (C) Oxygen
 - (D) Hydrogen
86. Which of the following light phenomena confirms the transverse nature of light?
- (A) Reflection of light
 - (B) Diffraction of light
 - (C) Dispersion of light
 - (D) Polarization of light
87. Which of the following lights deviates the most when it passes through a prism?
- (A) Red light
 - (B) Violet light
 - (C) Pink light
 - (D) White light
88. The light energy emitted by a star is due to
- (A) joining of nuclei
 - (B) burning of nuclei
 - (C) breaking of nuclei
 - (D) reflection of solar light
89. What bonds are present in a semiconductor?
- (A) Monovalent
 - (B) Bivalent
 - (C) Trivalent
 - (D) Covalent
90. A P-type semiconductor is
- (A) positively charged
 - (B) negatively charged
 - (C) uncharged
 - (D) None of the above

91. Put the verb into the correct form :

We _____ (have) a party next Saturday. Would you like to come?

- (A) have
- (B) will have
- (C) are having
- (D) are going to have

92. Arrange the words in the correct order to form a meaningful sentence :

The sudden spell

P. of showers washed out

Q. the suspended particles from

R. the air, a rare phenomenon in Delhi

- (A) PQR
- (B) RPQ
- (C) QPR
- (D) RQP

93. Pick the correct option :

The report concludes sadly that _____ students have _____ knowledge of nuclear physics.

- (A) very few, some
- (B) all, complete
- (C) no, more
- (D) less, any

94. Pick the correct option :

If I get the required assistance, I _____ pass the exam in the first attempt.

- (A) shall
- (B) must
- (C) might
- (D) could

95. Pick the correct option :

I'd love to stay _____.

- (A) yet I have to catch my bus
- (B) since I have to catch my bus
- (C) and I have to catch the bus
- (D) but I have to catch my bus

96. Identify the type of the following sentence :

James and Eva rode their bicycles after they ate lunch.

- (A) Simple
- (B) Compound
- (C) Complex
- (D) None of the above

97. Which word means the same as *philanthropy*?

- (A) Selfishness
- (B) Fascination
- (C) Disrespect
- (D) Charity

98. Which word is the opposite of *brittle*?

- (A) Flexible
- (B) Delicate
- (C) Breakable
- (D) Thin

99. In the following sentence, replace the italicized words or phrase with a more descriptive word that means the same thing.

Helicopters are specially designed to *float in* the air over an area.

- (A) Hydroplane
- (B) Revert
- (C) Transition
- (D) Hover

100. Choose the correct spelling for the missing word in the following sentence :

The first time Wendy drove her new car into town, all of her friends were _____.

- (A) jellous
- (B) jealous
- (C) jealuse
- (D) jeolous

SPACE FOR ROUGH WORK

SEAL

JSOMFL/BIOL/24/61-A

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