

Test Booklet

Series

A

Test Booklet No.

**Test Booklet
BIOTECHNOLOGY**

Name of Applicant Answer Sheet No.

Applicant Roll No. : Signature of Applicant :

Date of Examination: Signature of the Invigilator(s)
1.

Time of Examination : 2.

Duration : 1½ Hours]

[Maximum Marks : 70

IMPORTANT INSTRUCTIONS

- (i) The question paper is in the form of Test-Booklet containing **70 (Seventy)** questions. All questions are compulsory. Each question carries four answers marked (A), (B), (C) and (D), out of which only one is correct. Choose the correct option or the most appropriate option.
- (ii) On receipt of the Test-Booklet (Question Paper), the candidate should immediately check it and ensure that it contains all the pages, i.e., **70** questions. Discrepancy, if any, should be reported by the candidate to the invigilator immediately after receiving the Test-Booklet.
- (iii) A separate Answer-Sheet is provided with the Test-Booklet/Question Paper. On this sheet there are **70** rows containing four circles each. One row pertains to one question.
- (iv) The candidate should write his/her Roll number at the places provided on the cover page of the Test-Booklet/Question Paper and on the Answer-Sheet and **NOWHERE ELSE**.
- (v) No second Test-Booklet/Question Paper and Answer-Sheet will be given to a candidate. The candidates are advised to be careful in handling it and writing the answer on the Answer-Sheet.
- (vi) For every correct answer of the question **One (1) mark will be awarded**.
- (vii) Marking shall be done only on the basis of answers responded on the Answer-Sheet.
- (viii) To mark the answer on the Answer-Sheet, candidate should **darken** the appropriate circle in the row of each question with Blue or Black pen.
- (ix) For each question only **one** circle should be **darkened** as a mark of the answer adopted by the candidate. If more than one circle for the question are found darkened or with one black circle any other circle carries any mark, the answer will be treated as incorrect.
- (x) The candidates should not remove any paper from the Test-Booklet/Question Paper. Attempting to remove any paper shall be liable to be punished for use of unfair means.
- (xi) Rough work may be done on the blank space provided in the Test-Booklet/Question Paper only.
- (xii) *Mobile phones (even in Switch-off mode) and such other communication/programmable devices are not allowed inside the examination hall.*
- (xiii) No candidate shall be permitted to leave the examination hall before the expiry of the time.

DO NOT OPEN THIS QUESTION BOOKLET UNTIL ASKED TO DO SO.

PART-A

1. Find the correctly spelt words.

- (A) Inoculation (B) Innoculation
(C) Inoculation (D) Inoculation

2. Choose the part of sentence with error

Do not trouble / yourself about writing to me / unless you are quite / in the humour for it.

- (A) Do not trouble (B) yourself about writing to me
(C) unless you are quite (D) in the humour for it

3. Choose the word which is most similar in meaning to the word given below :

Persistent

- (A) merciful (B) tenacious
(C) intermittent (D) relenting

4. Choose the word which is most similar in meaning to the word given below :

Skeptical

- (A) dubious (B) dissenting
(C) convinced (D) cynical

Direction (Q. 5-7) : Below in each question some sentences are given, find the sentence which is not really contributing to the main theme and of the passage or find the odd sentence out and rearrange the remaining sentences to make a coherent paragraph.

5. (A) keep their inner life (B)/ Tightly under control (C)/ Educational institutions seldom serve as precise mirrors (D)/Of historical change because pedagogic and administrative rituals (E)/ That have nicely preserved an empty shell of a special inherited identity

- (A) CEDB (B) CDEB
(C) CDAB (D) None of these

6. (A) Most importantly the labour market' (B)/We can expect to see continued spillovers (C)/Into other areas of the economy, (D)/Combined with a 'broader unravelling of credit markets, (E)/ Parliament should act quickly to keep the economy from stalling
- (A) DECA (B) DEAC
(C) ECBD (D) No correction required
7. (A) And act judiciously to bring the economy back on track(B)/The start-up ecosystem cannot progress in a disturbed business cycle(C)/The economy appears to be in a shambles(D)/ Leaders in the government are failing to recognise the pessimism(E)/ And despite the gloomy forecasts for the future,
- (A) DAEB (B) BEDA
(C) CEDA (D) None of these
8. If a man were to sell his chair for Rs. 720, he would lose 25%. To gain 25% he should sell it for
- (A) Rs. 1,200 (B) Rs. 1,000
(C) Rs. 960 (D) Rs. 900
9. Two trains for Mumbai leave Delhi at 6 am and 6.45 am and travel at 100 kmph and 136 kmph respectively. How many kilometers from Delhi will the two trains be together?
- (A) 262.4 km (B) 260 km
(C) 283.33 km (D) 275 km
10. Choose the best option to fill in the blanks.
Girls have been teasing boys 20 minutes.
- (A) since (B) for
(C) from (D) in
11. Choose the best option to fill in the blanks.
Kites last year also.
- (A) did fly (B) were flown
(C) flew (D) flying

12. Choose the best option to fill in the blanks.
He felt no as he plunged the knife into her back.

- (A) qualms (B) scruple
(C) conscience (D) morals

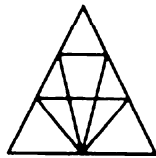
13. Find ? in the series 1, 2, 6, 7, 21, 22, 66, 67, ?

- (A) 70 (B) 134
(C) 201 (D) 301

14. Choose the word which is different from the rest.

- (A) Tortoise (B) Duck
(C) Snake (D) Whale

15. Find the number of triangles in the given figure.



- (A) 12 (B) 18
(C) 22 (D) 26

16. A family went for a vacation. Unfortunately, it rained daily for 13 days when they were there. But whenever it rained in the mornings, they had clear afternoons and vice versa. In all, they enjoyed 11 mornings and 12 afternoons. How many days in all did they stay there?

- (A) 15 (B) 18
(C) 20 (D) 25

17. Which organization has launched BHIM (BHarat Interface for Money) 3.0?

- (A) Reserve Bank of India (RBI)
(B) National Payments Corporation of India (NPCI)
(C) NITI Aayog
(D) Ministry of Finance

18. Which organization has launched an AI model for weather prediction called GenCast?
- (A) Microsoft (B) World Bank
(C) Google (D) World Meteorological Organization
19. Where is the headquarters of the International Atomic Energy Agency (IAEA) located?
- (A) Geneva, Switzerland (B) New York, USA
(C) Vienna, Austria (D) Paris, France
20. Who acts as the lender of last resort to all Public Sector Banks in India?
- (A) Finance Ministry (B) RBI
(C) State Bank of India (D) IMF

PART-B

21. Active transport takes place
- (A) Against concentration gradient and requires ATP
(B) Against concentration gradient and does not require ATP
(C) With concentration gradient and does not require ATP
(D) With concentration gradient and requires ATP
22. Which of the following is a genetic disorder caused by an abnormality in the number of chromosomes, specifically having an extra copy of chromosome 21?
- (A) Cystic fibrosis (B) Down syndrome
(C) Hemophilia (D) Huntington's disease
23. The enzyme needed for the transcription is
- (A) RNase (B) Restriction Enzymes
(C) RNA Polymerase (D) DNA Polymerase

24. Sigma factor is the part of the
- (A) DNA Ligase (B) RNA Polymerase
(C) DNA Polymerase (D) Endonuclease
25. In both the Eukaryotic cell and Prokaryotic cell, the synthesis of protein chains is started with the
- (A) Arginine (B) Serine
(C) Methionine (D) Valine
26. In eukaryotes, transcription begins only when
- (A) RNA Strand is available.
(B) Core Promoter Sequence is available or present.
(C) RNA Polymerase is available.
(D) None of the above.
27. What is the purpose of a plasmid in genetic engineering?
- (A) To cut DNA at specific sites using restriction enzymes
(B) To amplify DNA segments through PCR
(C) To serve as a vector for introducing foreign DNA into host cells
(D) To analyze the sequence of DNA using gel electrophoresis
28. What is the first step in genetic engineering?
- (A) Inserting the modified genes into the target organism
(B) Isolating specific genes or DNA fragments from a donor organism
(C) Creating recombinant DNA using a vector
(D) Transferring the genes using a gene gun

29. Which technology is commonly used to introduce foreign genes into the DNA of an organism?
(A) Polymerase Chain Reaction (PCR) (B) Southern blotting
(C) Recombinant DNA technology (D) CRISPR-Cas9
30. What is the term for organisms that have been genetically engineered with new genetic material?
(A) Hybrid organisms (B) Genetically modified organisms (GMOs)
(C) Transgenic organisms (D) Clones
31. What is a transgenic organism?
(A) An organism that has been cloned.
(B) An organism that has been genetically modified with DNA from another organism.
(C) An organism that is resistant to all diseases.
(D) An organism that has been mutated by radiation.
32. What is the role of the CRISPR-Cas9 system in genetic engineering?
(A) To amplify specific genes using PCR
(B) To cut DNA at specific locations and introduce precise genetic modifications
(C) To produce genetically identical copies of an organism
(D) To transfer genes from one species to another
33. Which type of chromatography uses a liquid mobile phase and a solid stationary phase?
(A) Gas chromatography (GC).
(B) High-performance liquid chromatography (HPLC).
(C) Paper chromatography.
(D) Thin-layer chromatography (TLC).
34. Which enzyme is commonly used in the PCR amplification step of RT-PCR?
(A) Reverse transcriptase (B) DNA polymerase
(C) RNA polymerase (D) Taq polymerase

35. ELISA is based on
- (A) antigen-antibody interaction (B) antigen-protein interaction
(C) lectin-antibody reaction (D) all of these
36. Which of the following is a limitation of the autoclave?
- (A) It takes too long to sterilize
(B) It lacks the ability to inactivate viruses
(C) It lacks the ability to kill endospores
(D) It will destroy heat labile materials
37. The capsid of bacteriophage is made up of
- (A) Lipids (B) Carbohydrates
(C) Proteins (D) Starch
38. Which of the following instrument is used for bacterial count?
- (A) Petroff-Hausser counting chamber (B) Microscope
(C) Chemostat (D) Turbidostat
39. Heat-labile class of immunoglobulins include
- (A) IgA (B) IgE
(C) IgG (D) IgM
40. A small protein subunit used in a vaccine may fail to stimulate T-cell immunity because of:
- (A) Lack of glycosylation
(B) Lack of carrier determinants
(C) HLA-related unresponsiveness
(D) Inherently insufficient antigen concentration

41. The basic Ig unit is composed of :
- (A) 2 identical heavy and 2 identical light chains.
 - (B) 2 identical heavy and 2 different light chains.
 - (C) 2 different heavy and 2 identical light chains.
 - (D) 2 different heavy and 2 different light chains.
42. Which of the following is an example of Epimers?
- (A) Glucose and Ribose
 - (B) Glucose and Galactose
 - (C) Galactose, Mannose and Glucose
 - (D) Glucose, Ribose and Mannose
43. Which of the following is true about DNA polymerase?
- (A) It can synthesize DNA in the 5' to 3' direction
 - (B) It can synthesize DNA in the 3' to 5' direction
 - (C) It can synthesize mRNA in the 3' to 5' direction
 - (D) It can synthesize mRNA in the 5' to 3' direction
44. Two sugars which differ from one another only in configuration around a single carbon atom are termed
- (A) Epimers
 - (B) Anomers
 - (C) Optical isomers
 - (D) Stereoisomers
45. The enzymes involved in Phosphorylation of glucose to glucose 6-phosphate are
- (A) Hexokinase
 - (B) Glucokinase
 - (C) Phosphofructokinase
 - (D) Both (A) and (B)
46. A vasodilating compound is produced by the decarboxylation of the amino acid :
- (A) Arginine
 - (B) Aspartic acid
 - (C) Glutamine
 - (D) Histidine
47. Denaturation of proteins results in
- (A) Disruption of primary structure
 - (B) Breakdown of peptide bonds
 - (C) Destruction of hydrogen bonds
 - (D) Irreversible changes in the molecule

48. Deterioration of food (rancidity) is due to presence of
- (A) Cholesterol (B) Vitamin E
(C) Peroxidation of lipids (D) Phenolic compounds
49. In enzyme kinetics K_m implies
- (A) The substrate concentration that gives one half V_{max}
(B) The dissociation constant for the enzyme substrate complex
(C) Concentration of enzyme
(D) Half of the substrate concentration required to achieve V_{max}
50. The primary stimulus for insulin secretion is increased.
- (A) Blood level of epinephrine (B) Blood level of glucagon
(C) Blood level of glucose (D) Water intake
51. In contrast to eukaryotic mRNA, prokaryotic mRNA
- (A) Can be polycistronic (B) Is synthesized with introns
(C) Can only be monocistronic (D) Has a poly A tail
52. The mechanism of synthesis of DNA and RNA are similar in all the following ways except
- (A) They involve release of pyrophosphate from each nucleotide added
(B) They require activated nucleotide precursor and Mg^{2+}
(C) The direction of synthesis is $5' \rightarrow 3'$
(D) They require a primer
53. The endomembrane system does not include which of the following?
- (A) Lysosome (B) Vacuole
(C) Golgi complex (D) Peroxisome

54. Organelles can be separated from the homogenate cell by
- (A) Autoradiography
 - (B) Differential centrifugation
 - (C) Chromatography
 - (D) X-ray diffraction
55. Which is not an example of transmembrane transport between different subcellular compartments?
- (A) Transport from the stroma into thylakoid space
 - (B) Transport from the cytoplasm into the lumen of the endoplasmic reticulum
 - (C) Transport from the endoplasmic reticulum into the Golgi complex
 - (D) Transport from mitochondrial intermembrane space into the mitochondrial matrix
56. Distribution of intrinsic proteins in the plasma membrane is
- (A) Random
 - (B) Symmetrical
 - (C) Asymmetrical
 - (D) None
57. Which of the following would relax negatively supercoiled DNA?
- (A) DNA gyrase
 - (B) Type I topoisomerase
 - (C) Collagen
 - (D) Elastin
58. The general name for normal genes that, when altered in specific ways, contribute to cancer formation is
- (A) Angiogenic factors
 - (B) Complement genes
 - (C) Proto-oncogenes
 - (D) Sarcoma genes
59. All of the following are true about antibodies, EXCEPT which one?
- (A) They fix complement.
 - (B) They occur on the surface of B-lymphocyte
 - (C) They predominate the primary immune response to antigen.
 - (D) They are molecule with a single, defined amino acid sequence.

60. The class of an immunoglobulin
- (A) Is determined by Class I and Class II major histocompatibility complex proteins
 - (B) Is determined by the carbohydrate attached to the light chain is
 - (C) Determined by the antigen
 - (D) Is determined by the heavy chain type
61. If the distance between the gene on the chromosome is more, then the gene shows
- (A) Less linkage
 - (B) Strong linkage
 - (C) Weak linkage
 - (D) Incomplete linkage
62. Degeneracy of genetic code is due to
- (A) Functional 61 codons and 20 amino acids
 - (B) Functional 64 codons and 20 amino acids
 - (C) Functional 20 codons and 20 amino acids
 - (D) Functional 20 codons and 61 amino acids
63. Signaling between cells usually results in the activation of protein
- (A) Lipases
 - (B) Kinases
 - (C) Proteases
 - (D) Nucleases
64. Mitosis involves separation of only sister chromatids while meiosis involves?
- (A) Also separation of only sister chromatids.
 - (B) Separation of only homologous chromosomes.
 - (C) Separation of homologous chromosomes as well as sister chromatids.
 - (D) Separation of sister chromatids twice
65. An extra finger in humans is rare but is due to a dominant gene. When one parent is normal and the other parent has an extra finger but is heterozygous for the trait, what is the probability that the first child will be normal?
- (A) 0%.
 - (B) 25%.
 - (C) 50%.
 - (D) 75%.

66. When the activity of one gene is suppressed by the activity of a non-allelic gene, it is known as
- (A) Pseudo-dominance (B) Hypostasis
(C) Epistasis (D) Incomplete dominance
67. A small amount of lethal mutation is always present in the population due to
- (A) Positive selection (B) Negative selection
(C) Frequency-dependent selection (D) Mutation-selection balance
68. Which of the following are antigen presenting cells (APCs) :
- (A) B cell, T cell, Macrophage (B) B cell, monocyte, basophil
(C) B cell, Dendritic cell, Macrophage (D) B cell, Macrophage, NK cell
69. What type of microscope is used to visualize cellular structures in high resolution?
- (A) Light microscope (B) Electron microscope
(C) Phase-contrast microscope (D) Compound microscope
70. First genetically engineered and biotechnologically produced vaccine was against
- (A) AIDS (B) Small pox
(C) Herpes simplex (D) Hepatitis B.

ROUGH WORK

ROUGH WORK