

CET 2009

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Code No.: 209101

Important : Please consult your Admit Card / Roll No. Slip before filling your Roll Number on the Test Booklet and Answer Sheet

Roll No.

In Figures

In Words

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O.M.R. Answer Sheet Serial No.

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Signature of the Candidate : _____

Paper : VI

Subject : Biotechnology

Time : 70 minutes

Number of Questions : 60

Maximum Marks : 120

DO NOT OPEN THE SEAL ON THE BOOKLET UNTIL ASKED TO DO SO

INSTRUCTIONS

1. Write your Roll No. on the Question Booklet and also on the OMR Answer Sheet in the space provided and nowhere else.
2. Enter the Subject and Code No. of Question Booklet on the OMR Answer Sheet. Darken the corresponding bubbles with **Black Ball Point / Black Gel pen.**
3. Do not make any identification mark on the Answer Sheet or Question Booklet.
4. To open the Question Booklet remove the paper seal (s) gently when asked to do so.
5. Please check that this Question Booklet contains **60** questions. In case of any discrepancy, inform the Assistant Superintendent within 10 minutes of the start of test.
6. Each question has four alternative answers (A, B, C, D) of which only one is correct. For each question, darken only one bubble (A or B or C or D), whichever you think is the correct answer, on the Answer Sheet with **Black Ball Point / Black Gel pen.**
7. If you do not want to answer a question, leave all the bubbles corresponding to that question blank in the Answer Sheet. No marks will be deducted in such cases.
8. Darken the bubbles in the OMR Answer Sheet according to the Serial No. of the questions given in the Question Booklet.
9. Negative marking will be adopted for evaluation i.e., 1/4th of the marks of the question will be deducted for each wrong answer. A wrong answer means incorrect answer or wrong filling of bubble.
10. For calculations, use of simple log tables is permitted. Borrowing of log tables and any other material is not allowed.
11. For rough work only the sheets marked "Rough Work" at the end of the Question Booklet be used.
12. The Answer Sheet is designed for **computer evaluation**. Therefore, if you do not follow the instructions given on the Answer Sheet, it may make evaluation by the computer difficult. **Any resultant loss to the candidate on the above account, i.e., not following the instructions completely, shall be of the candidate only.**
13. After the test, hand over the Question Booklet and the Answer Sheet to the Assistant Superintendent on duty.
14. In no case the Answer Sheet, the Question Booklet, or its part or any material copied/ noted from this Booklet is to be taken out of the examination hall. Any candidate found doing so would be expelled from the examination.
15. A candidate who creates disturbance of any kind or changes his/her seat or is found in possession of any paper possibly of any assistance or found giving or receiving assistance or found using any other unfair means during the examination will be expelled from the examination by the Centre Superintendent / Observer whose decision shall be final.
16. **Telecommunication equipment such as pager, cellular phone, wireless, scanner, etc., is not permitted inside the examination hall. Use of calculators is not allowed.**

1. **Prokaryotic ribosomes are :**

(A) 70S	(B) 80S
(C) 40S	(D) 58S
2. **Initiation codon for translation is :**

(A) AGG	(B) AUG
(C) AGU	(D) GAU
3. **Lac operon is :**

(A) Inducible system	(B) Repressible system
(C) Coordinate system	(D) Constitutive system
4. _____ is an alternative form of gene.

(A) Allele	(B) Operon
(C) Split gene	(D) Pseudogene
5. **In a microbial culture the order of various phases is :**

(A) Log, Lag, Stationary, Death	(B) Stationary, Log, Lag, Death
(C) Lag, Log, Stationary, Death	(D) Death, Log, Lag, Stationary
6. **Optimum temperature for growth of mesophiles is :**

(A) $\approx 55^{\circ}\text{C}$	(B) $\approx 37^{\circ}\text{C}$
(C) $\approx 10^{\circ}\text{C}$	(D) $\approx -20^{\circ}\text{C}$
7. **In an acidic solution, the pH is :**

(A) Greater than p(OH)	(B) Less than p(OH)
(C) Equal to p(OH)	(D) None of the above.
8. **Buffers keep the pH of the solution stable by :**

(A) Converting strong acids to weak one.	(B) Converting weak acids to strong one
(C) Converting weak bases to strong one	(D) None of the above
9. **Standard temperature and pressure refers to :**

(A) 0 atm and 273 K	(B) 1 atm and 273 K
(C) 101.325 kpa and 0 K	(D) 23 psi and 100 K
10. **How many atoms of carbon are present in 18 grams of glucose ?**

(A) 6.0×10^{22}	(B) 3.6×10^{23}
(C) 6.0×10^{23}	(D) 3.6×10^{24}
11. **A respiratory quotient is :**

(A) moles of CO_2 produced/ moles of O_2 produced
(B) moles of CO_2 produced/ moles of O_2 consumed
(C) moles of CO_2 consumed/ moles of O_2 produced
(D) moles of CO_2 consumed/ moles of O_2 consumed
12. **The international convention for the production of Industrial products in Paris was signed in year :**

(A) 1853	(B) 1838
(C) 1883	(D) 1889

- 13. Which of the following is 5C sugar ?**
- (A) Galactose (B) Ribose
(C) Glucose (D) Mannose
- 14. Maltose is composed of :**
- (A) Galactose + Glucose (B) Glucose + Fructose
(C) Glucose + Glucose (D) Galactose + Ribose
- 15. Cobalamin is :**
- (A) Vitamin B₆ (B) Vitamin B₁
(C) Vitamin A (D) Vitamin B₁₂
- 16. The conversion of CO₂ and H₂O into organic compounds using energy from light is called :**
- (A) Photorespiration (B) Fermentation
(C) Glycolysis (D) Photosynthesis
- 17. Chloroplast contains disc like membranous structures arranged in a stack is called :**
- (A) Cisternae (B) Grana
(C) Stroma (D) Thylakoids
- 18. _____ is not an amino acid.**
- (A) Histidine (B) Aspartic acid
(C) Alanine (D) Oleic acid.
- 19. The process of formation of nitrate from ammonia is known as :**
- (A) Nitrate assimilation (B) Nitrification
(C) Ammonia assimilation (D) Denitrification
- 20. Virus Mediated transfer of genetic material from one bacterial cell to another is called :**
- (A) Transduction (B) Transformation
(C) Conjugation (D) Reverse transcription
- 21. Cell theory was put forward by :**
- (A) Sutton and Boveri (B) Watson and Crick
(C) Darwin (D) Schleiden and Schwann
- 22. DNA replication takes place during :**
- (A) S phase (B) G1 phase
(C) G2 phase (D) Prophase
- 23. The phase of mitosis during which chromosome condense is :**
- (A) Metaphase (B) Prophase
(C) Telophase (D) Anaphase
- 24. Biologically important form of DNA is :**
- (A) A (B) Z
(C) B (D) H
- 25. Ultracentrifuge has speed :**
- (A) Maximum 12000 rpm (B) Maximum 25000 rpm
(C) More than 30000 rpm (D) 10000 rpm

- 26. Power house of cell is :**
- (A) Ribosomes (B) Golgi complex
(C) Mitochondria (D) Vacuoles
- 27. Animal tissue lacks :**
- (A) Mitochondria (B) Cell membrane
(C) Cell wall (D) Golgi bodies
- 28. _____ transports mineral and water in plants.**
- (A) Phloem (B) Xylem
(C) Epidermis (D) Roots
- 29. If a solution has pH 6.5 then its p(OH) is :**
- (A) 6.5 (B) 7.5
(C) 8.9 (D) 10
- 30. Cell fractionation is the most appropriate procedure for preparing _____ for study.**
- (A) Isolated cells which are normally found tightly attached to neighbouring cells
(B) Cells without a functional cytoskeleton
(C) Isolated organelles
(D) Bone and other similar cells which are situated within a mineral framework.
- 31. In PCR reactions Pfu is preferred over Taq as Pfu :**
- (A) Is more thermostable (B) Is optimally active at higher temperature
(C) Provides high fidelity (D) Was declared as molecule of the year 1989.
- 32. Which of the following vector can carry the longest piece of foreign DNA ?**
- (A) Plasmid (B) Cosmid
(C) BAC (D) YAC
- 33. In the discovery of introns, a DNA molecule called _____ was formed that had the same nucleotide sequence as the gene that produced the mRNA.**
- (A) mDNA (B) rDNA
(C) cDNA (D) tDNA
- 34. Bacteria protect themselves from viruses by fragmenting viral DNA upon entry with :**
- (A) Ligases (B) Endonucleases
(C) Exonucleases (D) Methylases
- 35. Northern blot is used for the analysis of :**
- (A) mRNA (B) DNA
(C) Protein (D) Nucleo-protein
- 36. The recommended CO₂ level needed for growing animal cells in cell culturing is :**
- (A) 1% (B) 2%
(C) 5% (D) 7%
- 37. A probe is used in which stage of the gene transfer process ?**
- (A) Cleaving DNA (B) Denaturation of DNA
(C) Cloning (D) Screening.

- 38. Conformational variation between B and Z forms of DNA is partially due to :**
- (A) Rotation of glycosidic bond (B) Loss of hydrogen bonds
(C) Lack of hydrophobic interaction (D) Increase in humidity.
- 39. A messenger RNA is 336 nucleotides long, including the initiator and termination codons. The number of amino acids in the protein translated from this mRNA is :**
- (A) 999 (B) 630
(C) 112 (D) 111
- 40. For the DNA strand 5' - TACGATCATAT-3' the correct complementary DNA strand is :**
- (A) 3' -TACGATCATAT-5' (B) 5' -ATGCTAGTATA-3'
(C) 3' -AUGCUAGUAUA-5' (D) 3' -ATGCTAGTATA-5'
- 41. DNA fingerprint analysis is based on the “Southern” hybridization technique. In this method :**
- (A) Nonradioactive cellular RNA, separated by electrophoresis and blotted onto a membrane filter, is tested for hybridization with a radioactive gene-specific probe of either RNA or DNA
(B) Radioactive DNA restriction fragments, separated by electrophoresis and blotted onto a membrane filter are tested for hybridization with a nonradioactive, gene-specific probe of either RNA or DNA
(C) Radioactive cellular RNA, separated by electrophoresis and blotted onto a membrane filter is tested for hybridization with a radioactive, gene-specific probe of either RNA or DNA
(D) Nonradioactive DNA restriction fragments, separated by electrophoresis and blotted onto a membrane filter are tested for hybridization with a radioactive, gene-specific probe of either RNA or DNA.
- 42. Streptomycin inhibits microbial growth by acting on :**
- (A) 30S ribosomal subunit (B) 50S ribosomal subunit
(C) 40S ribosomal subunit (D) 80S ribosomal subunit
- 43. Crown gall disease in plants is caused by :**
- (A) Agrobacterium niger (B) Agrobacterium faciens
(C) Agrobacterium tumifaciens (D) Agrobacterium plantum
- 44. Traditional method for the commercial production of citric acid is by :**
- (A) Batch fermentation (B) Continuous fermentation
(C) Synchronous production (D) Solid state fermentation
- 45. World Wide Web was developed at :**
- (A) University of Pennsylvania (B) Harvard University
(C) European Laboratory for Particle Physics (D) University of California
- 46. HEPES buffer is used in :**
- (A) Animal Tissue culture medium (B) Plant tissue culture medium
(C) Acterial nutrient medium (D) Yeast nutrient medium.
- 47. The most convenient and popular source of plant protoplast is the :**
- (A) Leaf (B) Root nodules
(C) Shoot tips (D) Coleoptile

- 48. Dideoxy DNA sequencing exclusively depends on one of the following :**
- (A) Termination (B) ATP
(C) Plasmid vector (D) Vector primer
- 49. Full form of BLAST is :**
- (A) Broad Local Alignment Search Tool (B) Basic Local Alignment Search Tool
(C) Basic Local Alignment Scanning Tool (D) Broad Local Alignment Scanning Tool
- 50. Which of the following is not an application of tissue culture ?**
- (A) Production of germ free plants (B) Improvement of crop plants
(C) Germplasm storage (D) Vegetative propagation
- 51. An E. coli cell produces several proteins. To purify one gram of an intracellular enzymes A from these proteins, nearly 2.007×10^{15} cells are required (Molecular weight of enzyme A is 1,00,000 daltons). Find out the number of enzyme A molecule produced per cell under optimum conditions.**
- (A) 2000 (B) 2050
(C) 3000 (D) 3050
- 52. Molecular Pharming mainly refers to production of pharmaceutical products in :**
- (A) Bacteria (B) Yeast
(C) Fungus (D) Animal milk
- 53. Shikonin is :**
- (A) Antimalarial, red pigment (B) Antimicrobial, red pigment
(C) Antimicrobial, green pigment (D) Antimalarial, green pigment
- 54. Most human pathogens prefer temperatures near that of the human body. They are called :**
- (A) Psychrophiles (B) Thermophiles
(C) Mesophiles (D) Halophiles
- 55. Organisms that ferment glucose may produce any of the following end products except :**
- (A) Lactic acid (B) Propionic acid
(C) Alcohol (D) Oxygen
- 56. Acidic amino acids are :**
- (A) Nonpolar and negatively charged at physiological pH
(B) Nonpolar and positively charged at physiological pH
(C) Polar and negatively charged at physiological pH
(D) Polar and positively charged at physiological pH
- 57. 2-D gel electrophoresis is the main tool in the study of :**
- (A) Genomics (B) Proteomics
(C) Bioinformatics (D) Gene cloning.
- 58. A mass of dividing, undifferentiated cells in a tissue culture is called :**
- (A) An embryoid (B) An aggregate
(C) A callus (D) A plasmodium

59. The use of RFLP or repeat DNA sequence to establish a unique pattern of DNA fragments from an individual is known as :

- (A) Footprinting
- (B) Fingerprinting
- (C) Handprinting
- (D) Bodyprinting

60. Insertion of cry gene in plant genome provides :

- (A) Herbicide resistance
- (B) Virus resistance
- (C) Insect resistance
- (D) Drought resistance

ROUGH WORK

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