

COMMON P. G. ENTRANCE TEST – 2024 (CPET-2024)

Test Booklet No. :

00066

Subject Code : **03**

Hall Ticket No. :

Subject : **BIOTECHNOLOGY**

TEST BOOKLET

Time Allowed : **60 Minutes**

Full Marks : **80**

: INSTRUCTIONS TO CANDIDATES :

1. The Test Booklet contains **15** pages including the cover page and **80** (Question Nos. 1 to 80) multiple choice questions.
2. DO NOT break open the seal of the Test Booklet until the invigilator instructs to do so.
3. The candidates must check discrepancy, if any (like up-printed or torn or missing pages or missing questions) in the Test Booklet immediately after breaking the seal of the Test Booklet. If detected, the invigilator may be requested to replace the same.
4. Candidates are required to fill up and darken the **Hall Ticket No, Test Booklet Serial No.** and OMR Answer Sheet Serial No. in attendance sheet carefully. Wrongly filled in OMR Answer Sheet is liable for rejection.
5. Each question has four choices / answers marked (A), (B), (C), (D). Candidate has to select the most appropriate choice / answer to each question and darken the oval completely against the question number provided in the OMR Answer Sheet.
6. Indicate only one choice / answer from the options provided by darkening the appropriate oval in the OMR Answer Sheet. More than one response to a question shall be treated as a wrong answer.
7. Use only **Black Ball Point Pen** for darkening the oval for answering.
8. All the questions are compulsory and they carry equal marks. The total marks scored by a candidate depends on the number of correct choices / answers darkened in the OMR Answer Sheet. There will be no negative marking for wrong answers.
9. No candidate shall be allowed to leave the Examination Hall / Room till all OMR Answer Sheets have been collected by the invigilator.
10. On completion of the entrance test, the original OMR Answer Sheet be handed over to the invigilator. Candidates are allowed to take the second copy of the OMR Answer Sheet along with the used Test Booklet for reference.
11. Candidates are not allowed to carry any personal belongings including electronic devices such as scientific calculator, cell phones, headphones, earbuds, or any other type of devices that allow communication of any kind inside the Examination Room / Hall.
12. The candidates are advised not to scribble or make any mark on the OMR Answer Sheet except marking the answers at the appropriate places and filling up the details required. Rough work, if any, may be done in the blank sheet(s) provided at the end of the Test Booklet.
13. Any malpractice / use of unfair means will lead to your disqualification from the entrance test / admission process and may also lead to appropriate legal action as deemed fit.

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

GO – 14/10

(Turn over)

SEAL

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Subject Code: 03

Subject: BIOLOGICAL SCIENCES

TEST BOOKLET

Roll Number: 03

Time Allowed: 100 minutes

INSTRUCTIONS TO CANDIDATES

The test booklet contains 100 questions. The questions are divided into two parts: Part A and Part B. Part A contains 20 questions and Part B contains 80 questions. The questions are of multiple choice type. The correct answer is to be marked in the answer sheet. The test booklet is to be used only for the purpose of the test. It is not to be taken away from the examination hall. The test booklet is to be returned to the invigilator at the end of the test. The test booklet is to be used only for the purpose of the test. It is not to be taken away from the examination hall. The test booklet is to be returned to the invigilator at the end of the test.

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

1. Which one of the following is used as vector for cloning genes into higher organisms ?
(A) *Salmonella typhimurium* (B) Retrovirus
(C) Baculovirus (D) *Neurospora crassa*
2. Spliceosomes are involved in :
(A) Cutting of DNA in genetic engineering
(B) Splitting of pre mRNA
(C) Formation of nucleosomes
(D) Prokaryotic DNA synthesis
3. What type of bioreactor uses a stirrer to mix the contents ?
(A) Stirred Tank bioreactor (B) Bubble column bioreactor
(C) Fluidized bed bioreactor (D) Air-lift bioreactor
4. Assuming that you are the writer of an original story, what type of intellectual property gives you the right to decide who can make and sell copies of your work ?
(A) Copyright (B) Geographical Indication
(C) Registered Design (D) Trademark
5. Which of the following is used in bio degradation of xenobiotics ?
(A) Enzymes (B) Chemicals
(C) Physical sorting (D) PAH
6. Which of the following is a pair of biofertilizers ?
(A) *Salmonella* and *E.coli* (B) *Rhizobium* and grasses
(C) *Nostoc* and legume (D) *Azolla* and BGA
7. Transformation with tungsten or gold coated DNA particle accelerated at high velocity is called :
(A) Acceleration method (B) High velocity method
(C) Particle gun delivery method (D) Microinjection

8. All of the following is produced by animal cells in culture and helps the cells adhere to the culture dish except :
- (A) Collagen (B) Glycoprotein
(C) Phospholipase A (D) Hyaluronic acid
9. To generate complete plantlet from a callus tissue in-plant tissue culture, the concentration of which of the component must be altered ?
- (A) Sugars (B) Hormones
(C) Amino Acids (D) Vitamins and Minerals
10. *Agrobacterium tumefaciens* is most commonly used in plant genetic engineering. Which of the following is true about *Agrobacterium tumefaciens* ?
- (A) Gram negative soil bacterium causing crown gall disease in dicots
(B) Gram negative soil bacterium causing crown gall disease in monocots
(C) Gram positive soil bacterium causing crown gall disease in dicots.
(D) Gram positive soil bacterium causing crown gall disease in monocots
11. Secondary metabolites are compounds produced by organisms which are not directly involved in normal growth. Which of the following is NOT a class of secondary metabolite ?
- (A) Amino acids (B) Terpenes
(C) Phenolics (D) Alkaloids
12. The type of culture which is prepared by inoculating directly from tissue of an organism to culture media is :
- (A) Primary cell culture (B) Secondary cell culture
(C) Cell lines (D) Transformed cell culture
13. The enzyme that catalyses the fixation of carbon dioxide in the Calvin cycle is :
- (A) Rubisco (B) Phosphofructokinase
(C) Pyruvate kinase (D) Citrate synthase
14. Which of the following is a major component of Cell membrane ?
- (A) Triglycerides (B) Phospholipids
(C) Steroids (D) Waxes

15. Which of the following Vitamins is essential for proper functioning of the enzymes that converts pyruvate to Acetyl-CoA ?
- (A) Vitamin B₁ (B) Vitamin B₂
(C) Vitamin B₃ (D) Vitamin B₁₂
16. Mendel did not observe linkage due to :
- (A) Mutation (B) Synapsis
(C) Crossing over (D) Independent assortment
17. The term gene was first used by :
- (A) Johannsen (B) Mendel
(C) Morgan (D) Bateson
18. Hydrogen atoms are added or removed by :
- (A) Hydrolases (B) Ligases
(C) Oxidoreductases (D) Isomerases
19. Standard error can be calculated by :
- (A) Standard deviation divided by square root of the sample size.
(B) Standard deviation divided by the sample size squared.
(C) Standard deviation divided by the square root of the variance.
(D) Standard deviation divided by the variance squared.
20. Why does sampling error occur ?
- (A) Because the sample does not have all the members of the population.
(B) Because the sample has all the members of the population.
(C) Because the sample is not representative of the population.
(D) Because the sample is too big.
21. Sanger method of sequencing involves use of :
- (A) Chemicals to cleave DNA (B) ddNTP
(C) Pyridine (D) Pyridoxine

22. Taq polymerase is essential for PCR because of its :
- (A) Ability to use dNTPs as substrate
 - (B) Ability to use ddNTPs as substrate
 - (C) Thermostability
 - (D) Ability to use RNA as template
23. Receptors on Mast cells are specific for :
- (A) IgE
 - (B) IgA
 - (C) IgG
 - (D) IgM
24. Which of the following cells possess polymorphonucleus ?
- (A) B cells
 - (B) Neutrophils
 - (C) Macrophage
 - (D) Erythrocytes
25. Which antibody is known to be responsible for allergic reactions ?
- (A) IgM
 - (B) IgA
 - (C) IgE
 - (D) IgD
26. Lymphatic system are primarily associated with :
- (A) Lymph recycling
 - (B) Phagocytosis
 - (C) Acquired immunity
 - (D) Innate immunity
27. Interferons are :
- (A) Antibacterial proteins
 - (B) Antiviral proteins
 - (C) Bacteriostatic proteins
 - (D) Fats
28. The ability of a pathogen to spread in the host tissues after establishing the infection is known as :
- (A) Adhesion
 - (B) Invasiveness
 - (C) Toxigenicity
 - (D) Bioactivity
29. Staining material of gram positive bacterium is :
- (A) Fast green
 - (B) Haematoxylin
 - (C) Crystal violet
 - (D) Safranin

30. Isolation is :
- (A) Purification of culture
 - (B) Introduction of inoculum
 - (C) Separation of a single colony
 - (D) To grow microorganisms on surfaces
31. Growth period of the culture is :
- (A) Inoculation
 - (B) Incubation
 - (C) Incineration
 - (D) Isolation
32. The major constituents in agar are :
- (A) Fats
 - (B) Amino acids
 - (C) Polysaccharides
 - (D) Polypeptides
33. What is the H^+ ion concentration of pure water ?
- (A) $1 \times 10^{-7} \text{ m}$
 - (B) $1 \times 10^7 \text{ m}$
 - (C) $1 \times 10^{-14} \text{ m}$
 - (D) $1 \times 10^{14} \text{ m}$
34. The human genome project was launched in the year :
- (A) 1980
 - (B) 1973
 - (C) 1990
 - (D) 1989
35. The first transgenic plant to be produced was :
- (A) Brinjal
 - (B) Tobacco
 - (C) Rice
 - (D) Cotton
36. DNA solution injected directly into the cell using micro-manipulators is called :
- (A) Macroinjection
 - (B) Microfusion
 - (C) Microfection
 - (D) Microinjection
37. Ribosome are synthesized in :
- (A) Golgi complex
 - (B) Mitochondria
 - (C) Nucleolus
 - (D) Nucleus

38. Spores in pteridophytes are :
- (A) Haploid (B) Diploid
(C) Triploid (D) Tetraploid
39. Endosperm in gymnosperm is :
- (A) Haploid (B) Triploid
(C) Diploid (D) Tetraploid
40. Alginates are found in the cell wall of :
- (A) Green algae (B) Yellow green algae
(C) Brown algae (D) Red algae
41. What are the major products of amino acid catabolism ?
- (A) Ketone bodies and tetrahydrofolate
(B) Tetrahydrofolate and glycogen
(C) Ketone bodies and glucose
(D) Glucose and tetrahydrofolate
42. Which of the following statements about protein synthesis is correct ?
- (A) All the information in DNA codes for proteins
(B) The mRNA formed by transcription of a region of DNA only contains information for the protein to be synthesised
(C) Both strands of DNA are transcribed to form mRNA
(D) The RNA formed by transcription of DNA undergoes splicing and further modifications to form mRNA
43. Which of the following is the main nitrogenous compound in urine ?
- (A) Uric acid (B) Ammonia
(C) Urea (D) Creatinine
44. In muscle, the first product generated in the breakdown of glycogen is :
- (A) Maltose (B) Glucose
(C) Glucose 6-phosphate (D) Glucose 1-phosphate

45. The term ' β -oxidation' refers to the following process :
- (A) The breakdown of triglycerides to fatty acids
 - (B) The breakdown of fatty acids to acetyl CoA
 - (C) The breakdown of pyruvate to acetyl CoA
 - (D) The breakdown of acetyl CoA to CO_2
46. The function of the TATA base sequence upstream of a structural gene is to serve as :
- (A) Ribosome binding site
 - (B) Codon for N-formyl Met
 - (C) Binding site for RNA polymerase
 - (D) Binding site for a transcriptional enhancer
47. During diastole, the heart is filled with :
- (A) Mixed blood
 - (B) Venous blood
 - (C) Oxygenated blood
 - (D) Deoxygenated blood
48. The initial complement component that is bound by complement-fixing antibodies is :
- (A) C1q
 - (B) C1s
 - (C) C3b
 - (D) C5a
49. 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.
50. What do error bars show ?
- (A) They show how variable your data are
 - (B) They show the extreme scores
 - (C) They show the interquartile-range of the data
 - (D) They show the largest and smallest data points

51. Pneumonia is caused by :
- (A) Bacteria
 - (B) Virus
 - (C) Fungi
 - (D) Algae
52. Which one of the following is true for the T-test ?
- (A) For a larger sample size, the peak becomes smaller and the tails become heavier.
 - (B) For a smaller sample size, the peak is higher and the tails are lighter.
 - (C) The distribution of the T-test is always normal.
 - (D) The larger your sample size, the closer t becomes to being normally distributed.
53. In living cells, similar to those found on Earth, were found on another planet where there was no oxygen. Which cell organelle would most probably be absent ?
- (A) Cell membrane
 - (B) Mitochondria
 - (C) Chromosome
 - (D) Ribosome
54. Which of the body reserves a starving man first consumes ?
- (A) Fat
 - (B) Glycogen
 - (C) Protein
 - (D) Vitamin
55. The water readily available to plants for absorption by roots is :
- (A) Gravitational water
 - (B) Hygroscopic water
 - (C) Capillary water
 - (D) Rain water
56. In photosystem I the first electron acceptor is :
- (A) Plastocyanin
 - (B) Cytochrome
 - (C) Ferredoxin
 - (D) An iron sulphur protein
57. While viewing the soil sample under the microscope you will notice a rod-shaped cell devoid of a nucleus. The only correct assumption that can be made of the cell thus far is that :
- (A) It is a eukaryote
 - (B) It is gram positive
 - (C) It contains peptidoglycan
 - (D) It contains mitochondria

58. Penicillin acts as a :
(A) Non-competitive inhibitor (B) Competitive inhibitor
(C) Zymogen (D) Denaturan
59. Microsoft Word is a _____ software.
(A) Application (B) Compiler
(C) System (D) Programming
60. All keywords in C are in :
(A) Lower case letters (B) Upper case letters
(C) Camel case letters (D) Variable letters
61. Montreal Protocol was signed to combat which of the following environmental issues ?
(A) Ozone Depletion (B) Sound Pollution
(C) Green House Emission (D) Soil Pollution
62. Ananda Chakraborty received the first US patent for a GM entity. The entity was :
(A) A Glofish
(B) A transgenic mouse expressing the growth hormone gene
(C) Cloned *E. coli*
(D) *Pseudomonas* engineered to degrade petroleum
63. A current of water is produced in branchiostoma by :
(A) Cillia (B) Cirri
(C) Wheel organ (D) Rostrum
64. The periplaneta belongs to which of these phyla ?
(A) Echinodermata (B) Annelida
(C) Mollusca (D) Arthropoda
65. The long hollow bones and connected air sacs are the characteristic features of :
(A) Reptilia (B) Aves
(C) Mammals (D) All vertebrates

66. Which of the following is the smallest unit of a computer ?
- (A) Bit (B) KB
(C) Nibble (D) Byte
67. Which of the following is an upstream process ?
- (A) Product recovery (B) Product purification
(C) Media formulation (D) Cell lysis
68. Which of the following is a downstream process ?
- (A) Product recovery (B) Screening
(C) Media formulation (D) Sterilization of media
69. For the DNA strand 5'-TACGATCATAT-3' Complementary DNA strand is :
- (A) 3'-TACGATCATAT-5'
(B) 5'-ATGCTAGTATA-3'
(C) 3'-AUGCUAGUAUA-5'
(D) 3'-ATGCTAGTATA-5'
70. World Health Organisation on 11th February, 2020 announced an official name for the diseases that caused the 2019 novel Coronavirus outbreak. What was the name of the disease ?
- (A) COVID-19 (B) COVn-19
(C) ConV-20 (D) COnVID-19
71. A clinical trial in which blood is transfused from recovered COVID-19 patients to a Coronavirus patient who is in critical condition ?
- (A) Plasma Therapy (B) Solidarity
(C) Remdesivir (D) Hydroxy chloroquine

72. The theory of blood clotting given by Macfarlane is known as :
 (A) Enzyme cascade theory (B) Hyman theory
 (C) Fuld and Spiro theory (D) Huxley theory
73. The first process by which water enters into the seed coat when a seed is placed in a suitable environment for germination is :
 (A) Osmosis (B) Active transport
 (C) Absorption (D) Imbibition
74. In a linear polysaccharide, the monomers are attached with each other through :
 (A) β 1-4 glucosidase bond (B) β 1-6 glucosidase bond
 (C) β 1-6 glucosidase bond (D) β 2-4 glucosidase bond
75. Which of the following microbes provide a natural system for gene transfer to produce transgenic plant ?
 (A) *E. coli* (B) *Pseudomonas syringae*
 (C) *Agrobacterium tumifaciens* (D) *Bacillus thuringensis*
76. Macrophages are best described as :
 (A) APCs (B) Lymphocytes
 (C) CD8 (D) Regulatory cells
77. Nucleotides have a nitrogenous base attached to a sugar at the :
 (A) 1' carbon (B) 2' carbon
 (C) 3' carbon (D) 4' carbon
78. Spindle fibres are chemically formed of :
 (A) Actin (B) Myosin
 (C) Collagen (D) Tubulin
79. A graft between members of the same species is termed an :
 (A) Isograft (B) Autograft
 (C) Xenograft (D) Allograft

80. Antibody titer refers to the :

- (A) Absolute amount of specific antibody
- (B) Concentration of specific antibody
- (C) Avidity of specific antibody
- (D) Highest dilution of antibody still able to give a positive result in a test system



SPACE FOR ROUGH WORK

SPACE FOR ROUGH WORK

SEAL

60-1410 (2.600)

(15)

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