Question Booklet No.: Question Booklet Series: **B**

ENTRANCE TEST - 2025

Masters Programme in Biotechnology (Non-GAT-B) [Self Finance]

Total Questions: 60 **Roll No.** | | | | | | |

Time Allowed: 70 Minutes

Important Instructions for Candidates:

1. Candidates shall compulsorily use only **blue/ black ball point pen**. In no case gel/ink pen or pencil should be used.
2. Compulsorily write your **roll number** in the space provided at the top of this page of the question booklet.
3. Fill up the necessary information in the spaces provided on OMR Answer sheet including **Question Booklet Number** and **Question Booklet Series**.
4. OMR Answer sheet has an original copy and a candidate's copy glued beneath it at the top. While making entries in the original copy, candidate should ensure that the **two copies are aligned properly** so that the entries made in the original copy against each item are exactly copied in the candidate's copy.
5. All entries in the OMR Answer Sheet, including answers to questions, are to be recorded in the Original Copy only.
6. **Choose only one correct/most appropriate response** for each question among the options A, B, C and D and darken the circle of the appropriate response completely. Incompletely darkened circle is not correctly read by the OMR scanner and no complaint to this effect shall be entertained.
7. **Do not darken more the one circle of option for any question. A question with more than one darkened response shall be considered wrong.**
8. **There will be negative marking for wrong answers. Each wrong answer will lead to deduction of 0.25 marks per wrong answer from the score.**
9. Only those candidates who obtain positive score in Entrance Test shall be eligible for admission.
10. Do not make any stray mark on the OMR sheet as this may lead to errors while scanning.
11. OMR answer sheet must be handled carefully and it should not be folded or mutilated, as in such case it will not be properly evaluated by the machine.
12. No Electronic gadgets including calculators, mobiles, smart watches, blue tooth etc. shall be permitted inside the examination hall.
13. Rough work, if any, should be done on the blank sheets provided with the question booklet.
14. Ensure that the OMR Sheet is signed by the Examinee as well as by the invigilator.
15. At the end of the examination, fold the OMR Sheet along the crease on the top and tear off the top strip to separate the Original OMR Sheet from the Duplicate Copy.
16. Hand over the Original OMR answer sheet to the invigilator and retain the candidate's copy of OMR, Question Booklet and Admit card for your reference.
17. If any of the information in the response Sheet/Question Paper has been found missing or not mentioned as stated above, the candidate is solely responsible for that lapse.
18. Any deficiency on the OMR shall be the responsibility of the candidate himself/herself.

Q1) Eukaryotic Ribosome biogenesis occurs in:
A) Nucleolous
B) peroxisomes
C) Nucelosomes
D) Lysosomes

Q2) Which of the following is a substrate for gluconeogenesis:
A) Lactate
B) Glucose
C) Glycogen
D) All the above

Q3) Which of the following is NOT the product of TCA cycle:
A) NADH
B) NADPH
C) Carbon Dioxide
D) GTP

Q4) Which of the following is nucleoside:
A) Adenosine monophosphate
B) Adenosine
C) Adenosine diphosphate
D) Adenosine triphosphate

Q5) Beta-oxidation of palmitate fatty acid produces:
A) Acety CoA
B) NADH
C) $FADH_2$
D) All of the above

Q6) ATP synthesis during photophosphorylation is mediated by:
A) Electron gradient across thylakoid membrane
B) Oxygen gradient across thylakoid membrane
C) Proton gradient across thylakoid membrane
D) All the above

Q7) In a redox reaction, reducing agent gets:
A) Reduced
B) Oxidized
C) No change
D) None of the above

Q8) ATP synthesis during Oxidative phosphorylation is catalyzed by:
A) F1 component of FOF1 complex
B) FO component of FOF1 complex
C) Complex IV of electron transport chain
D) Complex III of electron transport chain

Q9) During electron transfer from NADH to oxygen in mitochondrial membrane, oxygen is:
A) Reduced
B) Oxidized
C) Neither oxidized nor reduced
D) None of the above

Q10) Two strands of DNA are replicated by:
A) Discontinuous mode
B) Continuous mode
C) Semi-discontinuous mode
D) Dispersive mode

Q11) Which of the following transcriptional element is orientation non-specific:
A) Activator
B) Enhancer
C) Promoter
D) All the above

Q12) Which of the following is post-translational modification:
A) Addition of Poly-A tail
B) Addition of G-cap
C) Phosphorylation
D) None of Above

Q13) The Kozak sequence is present in:
A) Prokaryotic mRNA
B) Eukaryotic mRNA
C) t-RNA
D) Ribosomal RNA

Q14) Which of the following is NOT the typical feature of type-II restriction enzymes:
A) Their DNA recognition site is usually palindromic
B) They cut DNA within or adjacent to recognition site
C) They leave phosphate at 5` end of cut DNA
D) None of Above

Q15) Which of the following cloning vector is hybrid of bacteriophage lambda and plasmid:
A) Cosmid
B) Bacmid
C) Phagemid
D) All the above

Q16) Which of the following is the bacterial selection marker gene:
A) Ampicillin
B) beta lactamase
C) Tetracycline
D) All the above

Q17) DNA ligases catalyze the formation of:
A) Hydrogen bonds
B) phosphodiester bonds
C) phosphoanhydride bonds
D) All the above

Q18) Antigens are primarily composed of
A) Proteins
B) Carbohydrates
C) Lipids
D) Nucleic acids

Q19) Antibody responsible for allergic reactions is
A) IgG
B) IgM
C) IgA
D) IgE

Q20) Which complement system pathway is activated by antibodies?
A) Classical pathway
B) Alternate pathway
C) Lectin pathway
D) All of the above

Q21) Which of the following is NOT lymphoid organ
A) Spleen
B) Thymus
C) Tonsils
D) None of the above

Q22) Which of the following is correct regarding gel exclusion chromatography:
A) Large molecules elute first from the column
B) It can be used for desalting protein solution
C) Small molecules elute last from the column
D) All of the above

Q23) In denaturation gel electrophoresis, the denaturant used is:
A) Urea
B) sodium dodecayl sulphate
C) beta mercaptoethanol
D) Both (A) and (B)

Q24) In density gradient centrifugation, the sedimentation velocity of a particle becomes zero:

A) When density of particles is equal with that of medium

B) When density of particle is more that of medium

C) When density of particle is less that of medium

D) None of the above

Q25) In which blotting technique, antibodies are used as probe:

A) Southern Blotting

B) Northern Blotting

C) Western Blotting

D) All of the above

Q26) The genotypic ratio of a monohybrid cross is

A) 1:2:1

B) 3:1

C) 9:3:3:1

D) 1:1:2

Q27) A genetic disorder caused by the presence of an extra full or partial copy of chromosome 21

A) Down syndrome

B) Klinefelter syndrome

C) Turner syndrome

D) Cry syndrome

Q28) The inheritance of one gene doesn't affect the inheritance of another gene is commonly known as

A) Law of Dominance

B) Law of Independent Assortment

C) Law of Segregation

D) Law of Co-Dominance

Q29) The mutation theory of evolution was proposed by

A) Darwin

B) Mendel

C) Hugo de Vries

D) Robert Hook

Q30) Golden rice is rich in

A) Vitamin A

B) Vitamin C

C) Vitamin B

D) Vitamin E

Q31) Transgenic plants are

A) Genetically modified

B) Genetically similar to parent plants

C) Genetically haploid only

D) None of the above

Q32) Agrobacterium tumefaciens cause

A) Boll rot disease

B) Crown gall disease

C) Leaf wilt

D) Blights

Q33) *Bacillus thuringiensis* produces

A) Fry protein

B) Cry protein

C) Met protein

D) All of the above

Q34) Bacterial cell wall is composed of

A) Cellulose

B) Cellulose and Pectin

C) Peptidoglycan

D) None of the above

Q35) Which of the following involves virus:

A) Transformation

B) Transduction

C) Conjugation

D) All of the above

Q36) Which of the following is NOT a phase of bacterial growth
A) Lag phase
B) Stationary phase
C) Log phase
D) None of the above

Q37) Penicillin inhibits
A) Protein synthesis
B) Mitochondrial function
C) Cell wall formation
D) Cell communication

Q38) Which technique ensures that every individual has an equal chance of being selected?
A) Quota sampling
B) Cluster sampling
C) Simple random sampling
D) Systematic bias sampling

Q39) The mean is best used when:
A) Data is skewed
B) Data is normally distributed
C) There are extreme outliers
D) The data is nominal

Q40) If all values in a dataset are the same, the standard deviation is:
A) 1
B) 0
C) Undefined
D) Infinity

Q41) The purpose of a t-test is to:
A) Estimate sample size
B) Compare the means of two groups
C) Test the relationship between two variables
D) Analyze categorical data

Q42) Which of the following is NOT a type of bioreactor?
A) Stirred tank reactor
B) Airlift reactor
C) Packed bed reactor
D) Nuclear reactor

Q43) The method of enzyme immobilization that may lead to leakage of enzyme due to weak binding is:
A) Adsorption
B) Covalent bonding
C) Encapsulation
D) Cross-linking

Q44) Which of the following is NOT essential for mammalian cell culture:
A) Incubator
B) Carbon Dioxide
C) Cell culture hood
D) None of the above

Q45) Which of the following is required for cell counting:
A) Hemocytometer
B) Spectrophotometer
C) Nanometer
D) luminometer

Q46) Protonation of water leads to the formation of:
A) Hydride ion
B) Hydronium ion
C) Hydrogen
D) Hydroxyl ion

Q47) Which of the following statement is correct:
A) Solubility of a salt increases with the increase in the dielectric constant of solvent
B) Solubility of a salt decreases with the increase in the dielectric constant of solvent
C) Decrease in temperature increases solubility
D) None of the above

Q48) Exergonic reactions have:
A) Positive enthalpy change
B) Negative entropy change
C) Negative free energy change
D) Positive free energy change

Q49) Acid is defined as:
A) That accepts proton
B) That donates electron
C) Both (A) and (B)
D) That accepts electron

Q50) Which of the following statement about peptide bond is correct
A) It is planar in structure
B)It has partial double bond character
C) Both (A) and (B)
D) None of above

Q51) The double bond in the naturally occurring unsaturated fatty acids is usually in:
A) *Cis* configuration
B) Trans configuration
C) Both (A) and (B)
D) None of the above

Q52) Ring structure of Glucose is in the form of:
A) Pyranose
B) Furanose
C) Branched
D) All of the above

Q53) At neutral pH, DNA possess:
A) Neutral charge
B) Positive charge
C) Negative charge
D) Zwitter ion

Q54) Competitive inhibition can be reversed by:
A) Lowering the pH
B) Increasing substrate concentration
C) Increasing enzyme concentration
D) Adding more inhibitor

Q55) The sigmoidal (S-shaped) curve in enzyme kinetics is characteristic of:
A) Michaelis-Menten enzymes
B) Competitive inhibition
C) Allosteric enzymes
D) Zero-order reactions

Q56) Which of the following statements about enzymes is TRUE:
A) Enzymes increase the activation energy of a reaction
B) Enzymes are consumed during the reaction
C) Enzymes form permanent bonds with substrates
D) Enzymes lower the activation energy without being consumed

Q57) Which of the following best explains the effect of pH on enzyme activity:
A) pH only affects the substrate
B) pH affects ionization of amino acids in the enzyme
C) At all pH values, enzymes work equally well
D) Enzymes require a neutral pH always

Q58) Plasma membrane fluidity decreases with:
A) More unsaturated fatty acids
B) More saturated fatty acids
C) High Temperature
D) All of the above

Q59) Which of the following is correct regarding inner mitochondrial membrane:
A) It is permeable to ions
B) It is smooth in nature
C) Both (A) and (B)
D) None of the Above

Q60) Which of the following is correct regarding the sodium-potassium pump:

A) It pumps sodium out and potassium inside cell against the gradient

B) It pumps sodium in and potassium outside cell against the gradient.

C) It pumps both sodium and potassium outside cell along the gradient

D) It pumps both sodium and potassium inside cell against the gradient.