Question Booklet No. : .....

ENTRANCE TEST-2025

SCHOOL OF BIOLOGICAL SCIENCES

BIOCHEMISTRY

Total Questions : **60**
Time Allowed : **70 Minutes**

Question Booklet Series **A**

Entrance Test Roll No. : | | | | | | |

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 **entrance test 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 than 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 scanning machine.
12. Use of Electronic gadgets like calculator, mobile, smart watch, blue tooth etc. is strictly prohibited.
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. Compulsorily hand over the **Original OMR Answer Sheet** to the invigilator.
17. Candidate's can retain duplicate copy of the OMR, Question Booklet and Admit Card.
18. 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.
19. Any deficiency on the OMR shall be the responsibility of the candidate himself/herself.

1. Heterolytic cleavage of carbon-hydrogen bond (–C–H) results in the formation of carbon-cation and:

(A) Hydride ion

(B) Proton

(C) Hydrogen free radical

(D) None of the above

2. Which of the following is the most electronegative element ?

(A) Fluorine

(B) Chlorine

(C) Nitrogen

(D) Oxygen

3. Which of the following functional group(s) can form hydrogen bond with water ?

(A) Keto- group

(B) Amino-group

(C) Both (A) and (B)

(D) None of the above

4. Which of the following do not shows optical isomerism ?

(A) Valine

(B) Proline

(C) Serine

(D) Glycine

5. The indicator of reaction spontaneity is determined by the Gibb's free energy reaction: $\Delta G = \Delta H - T\Delta S$. If a reaction has negative ΔH and positive ΔS, the reaction is:

(A) Enthalpically favored, but entropically opposed

(B) Enthalpically opposed, but entropically favored

(C) Enthalpically as well as entropically favored

(D) Enthalpically as well as entropically opposed

6. In the following reaction: $HA + H_2O \rightarrow H_3O^+ + A^-$, the H_2O acts as a:

(A) Bronsted acid

(B) Bronsted base

(C) Both (A) and (B)

(D) Neither acid nor base

7. When water freezes into ice, its entropy:

(A) Decreases

(B) Increases

(C) Neither increases nor decreases

(D) Initially remains constant and then increases

8. For a reaction at equilibrium, the free energy change is :

(A) Zero

(B) Positive

(C) Negative

(D) None of the above

9. Photo systems (PS-I and PS-II) are found in:

(A) Granum

(B) Thylakoid membrane

(C) Stroma

(D) Outer membrane

10. Photorespiration produces:

(A) CO_2

(B) ATP

(C) NADPH

(D) NADH

11. 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

12. Low auxin to cytokine ratio leads to:

(A) Root formation

(B) Callus formation

(C) Shoot formation

(D) None of the above

13. Which of the gaseous air pollutants is the cause of acid rain?

(A) SO_2

(B) NO_2

(C) CH_4

(D) Both (A) and (B)

14. Which of the following is NOT a green house gas ?

(A) Ozone

(B) Carbon dioxide

(C) Methane

(D) None of the above

15. The excess growth of phytoplankton in water due to presence of nutrient enrichment is called:

(A) Algal bloom

(B) Fungal bloom

(C) Animal bloom

(D) All the above

16. Lichens are indicator of :

(A) Sulphur dioxide pollution

(B) Carbon dioxide pollution

(C) Both (A) and (B)

(D) Carbon Monoxide

17. Which of the following is NOT present in the bacterial cell wall ?

(A) N-acetyl muramic acid

(B) N-acetyl glucosamine

(C) Peptide chain

(D) None of the above

18. The typical growth curve of the bacterial culture is :

(A) Hyperbolic

(B) Linear with positive slope

(C) Linear with negative slope

(D) Sigmoidal

19. Which statement is true about peplomeres ?

(A) These are spike like projection on capsid

(B) These are individual units of capsids

(C) These are spike like projections on enveloped viruses

(D) These are inner projections on viral membrane

20. Which of the following is/are characteristics of staphylococci ?

(A) Appear as grape-like cluster

(B) Non-motile, non-spore forming

(C) Facultative anaerobic

(D) All the above

21. If an amino acid has isoelectric point of 6.8, its net charge at pH 10 will be :

(A) Positive

(B) Negative

(C) No Charge

(D) Zwitter ion

22. Fructose is :

(A) Aldohexose

(B) Ketohexose

(C) Ketopentose

(D) Aldopentose

23. Triacylglycerides are :

(A) Anhydrides of three fatty acid molecules

(B) Esters of fatty acids and glycerol

(C) Proteins containing fatty acids

(D) Free fatty acids

24. Ramachandran plot is obtained simply by plotting :

(A) N–C_α bond & C_α–C bond

(B) C–C bond & C_α–C bond

(C) N–H bond & C–N bond

(D) N–C_α bond & C–O bond

25. Reversible competitive inhibition of an enzymatic reaction can be relieved by :

(A) Decreasing the concentration of products

(B) Increasing the concentration of substrate

(C) Decreasing the substrate concentration

(D) Both (A) and (C)

26. During un-competitive inhibition, the inhibitor usually binds :

(A) At same site where substrate binds

(B) Enzyme-substrate (ES) complex

(C) Substrate

(D) Products

27. Kinases belong to the following class of enzyme family :

(A) Oxido-reductases

(B) Hydrolases

(C) Transferases

(D) Ligases

28. Which of the following is correct statement regarding Michaelis-Menten kinetics ?

(A) The maximum velocity of enzyme-catalyzed reaction is determined by K_m

(B) The Enzyme with low K_m has least affinity for its substrate

(C) The K_m is a measure of dissociation constant of an enzyme-catalyzed reaction

(D) None of the above

29. Brown fat of a adipose tissue is "brown" due to the presence of :

(A) Anthocyanins

(B) Cholesterol

(C) Cytochromes

(D) Lipoproteins

30. Catabolic product of purine degradation is :

(A) Acetyl CoA

(B) Urea

(C) Uric acid

(D) All the above

31. Based on the reduction potential of the following components of the electron transport chain, which one has strongest reduction potential?

(A) NADH (E= –0.315)

(B) CoQ (E= 0.045)

(C) Cyc C (E= 0.235)

(D) O_2 (E= 0.815)

32. Which of the following is an anaplerotic reaction ?

(A) Conversion of pyruvate to lactate by lactate dehydrogenase

(B) Conversion of pyruvate to acetyl-CoA by pyruvate dehydrogenase

(C) Conversion of pyruvate to oxaloacetate by pyruvate carboxylase

(D) All the above

33. Which of the following is correct regarding eukaryotic mitochondria ?

(A) The outer membrane is extensively invaginated called cristae

(B) The inner mitochondrial membrane is permeable to protons

(C) The number of cristae does not vary with the respiratory state of the cell

(D) None of the above

34. The proteins involved in forming gap-junctions between cells are called :

(A) Adherins

(B) Pannexins

(C) Connexins

(D) All the above

35. Which of the cell-cycle component shows significant differential expression during mammalian cell cycle ?

(A) Innexins

(B) Cyclins

(C) Both (A) and (B)

(D) Cyclases

36. In biological membranes, the fluidity of membrane is increased by :

(A) Saturated fatty acids

(B) Unsaturated fatty acids

(C) Both (A) and (B)

(D) None of the above

37. In heterozygous conditions, two alleles for a particular character show intermediate phenotype, the ratio of F2 progeny will be :

(A) 3 : 1

(B) 1 : 2 : 1

(C) 2 : 1 : 1

(D) 1 : 1 : 2

38. KOZAK sequence is:

(A) RNA sequence in and around the initiation codon of eukaryotic mRNA

(B) RNA sequence in and around the initiation codon of prokaryotic mRNA

(C) RNA sequence present in the eukaryotic ribosome

(D) RNA sequence present in the prokaryotic ribosome

39. Which of the following is NOT the component of the transcription ?

(A) Enhancer

(B) Pribnow box

(C) Primer

(D) None of the above

40. Which of the following is the correct order of events that occur during the homologous recombination ?

(A) Strand invasion-Holliday junction formation-branch migration-resolution

(B) Resolution-branch migration-Holliday junction formation-strand invasion

(C) Branch migration-resolution-strand invasion-Holliday junction formation

(D) Holliday junction formation-resolution-branch migration-strand invasion

41. 100 ml of 1 molar glucose solution was taken and dissolved in 900 ml of pure water. The molarity of glucose in the new solution is:

(A) 100 mM

(B) 50 mM

(C) 200 mM

(D) 150 Mm

42. In density gradient centrifugation, when the density of the sedimenting particle exactly matches to the density of the medium, the sedimentation velocity of the particle will become:

(A) Faster

(B) Slower

(C) Zero

(D) None of above

43. Which of the following is NOT used in denaturation and non-reducing polyacrylamide gel electrophoresis ?

(A) SDS

(B) Betamercaptoethanol

(C) Ammonium per sulphate

(D) Urea

44. Which of the following is NOT correct regarding the gel exclusion chromatography ?

(A) It can be used for the desalting of protein solution

(B) The smaller molecular weight proteins are eluted first, followed by the larger molecular weight proteins

(C) It can be used for the determination of the molecular weight of the proteins

(D) It can be used for the separation of proteins

45. Which of the following hormone is released during "Fight or Flight" response?

(A) Epinephrine

(B) Glucagon

(C) Insulin

(D) None of the above

46. Which of the following is required for the digestion of triglycerides ?

(A) Amylases

(B) Lipases

(C) Anhydrases

(D) All the above

47. Which of the following molecule plays vital role in deoxygenation of hemoglobin in respiration ?

(A) Glyceraldehyde

(B) Dihydroxyacetone phosphate

(C) 2,3 Bisphosphoglycerate

(D) None of the above

48. Which of the following is the largest artery of the human body ?

(A) Aorta

(B) Subclavian artery

(C) Femoral artery

(D) None of the above

49. Body Mass Index of an individual is calculated as:

(A) Weight in Kg Square divided by height in Meter Square

(B) Height in Meter Square divided by Weight in Kg

(C) Weight in Kg divided by height in Meter Square

(D) Weight in Kg divided by height in Meter

50. Which of the following aminotransferases is used for clinical diagnosis of liver function ?

(A) Glutamate oxaloacetate transferase

(B) Lactate Dehydrogenase

(C) Alkaline phosphatase

(D) Acetyl transferase

51. Which of the following is NOT correct regarding Creatinine ?

(A) It is the by-product of creatine

(B) It is produced in Muscle

(C) It is used as diagnostic test for kidney function

(D) None of the above

52. Which of the following blood test is used to diagnose heart attack ?

(A) Creatine kinase-MB

(B) Troponin

(C) Both (A) and (B)

(D) None of the above

53. Cleavage of IgG antibody with papain results in :

(A) Two Fab domains and one Fc domain

(B) Two Fc domains and one Fab domain

(C) One Fab and one Fc domain

(D) One Fc domain and none Fab domain

54. Which of the following is correct regarding the monoclonal antibodies ?

(A) They recognize multiple epitopes on the single antigens

(B) They recognize multiple epitopes on different antigens

(C) They are produced by a single clone of B-cells

(D) All of the above

55. Which of the following is activated by antibodies ?

(A) Classical pathway of the compliment system

(B) Alternative pathway of the compliment system

(C) Lectin pathway of the complex system

(D) All the above

56. Which of the following statement is NOT correct ?

(A) Spleen phagocytes antibody coated microbes

(B) Spleen is a lymphoid organ

(C) Red pulp is present in spleen

(D) None of the above

57. Restriction endonucleases were first discovered in:

(A) Bacterophages

(B) Viruses

(C) Protozoans

(D) Bacteria

58. Which of the following is a hybrid vector of bacteriophage and plasmid vector ?

(A) Cosmid

(B) M13

(C) pUC vector

(D) Lambda replacement vector

59. When a foreign DNA is cloned in a plasmid vector, the Phosphodiester bond between the foreign DNA and vector is catalyzed by :

(A) DNA polymerase

(B) Restriction endonuclease

(C) Ligase

(D) Alkaline phosphatase

60. Which of the following is NOT the component of DNA polymerase chain reaction ?

(A) Oligonucleotides

(B) Ribonucleotides

(C) DNA polymerase

(D) Template

ROUGH WORK

ROUGH WORK

Sr. No. 401

ENTRANCE TEST-2024

SCHOOL OF BIOLOGICAL SCIENCES

BIOCHEMISTRY

Total Questions : 60
Time Allowed : 70 Minutes

Question Booklet Series A

Roll No. : | | | | | | |

Instructions for Candidates :

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SEAL

1. From the following molecules which one is having least bond angle ?
   (A) NH_3
   (B) PH_3
   (C) CH_4
   (D) H_2O
2. Which among the following molecules is more acidic ?
   (A) Ortho-nitrophenol
   (B) Para-nitrophenol
   (C) Phenol
   (D) None of the above
3. Linking two cysteine molecules through a disulphide bond forms Cystine. This type of bond/ link is called as the :
   (A) Covalent bond
   (B) Ionic interaction
   (C) Hydrophobic interaction
   (D) van der Waals force
4. Epimers are those isomers of sugars where two structures/molecules differ in configuration with respect to one –OH group around a chiral carbon, there by D-Glucose has _____ Epimers.
   (A) 2
   (B) 4
   (C) 8
   (D) 16
5. A gas is allowed to expand isothermally and reversibly from 20 m^3 to 40 m^3 at 27°C and the work obtained is 9.508 kJ, the number of moles of such a gas may be :
   (A) 2.75
   (B) 3.45
   (C) 5.5
   (D) 11.0
6. Which among the following represents the correct order of units for $\Delta H°$, $\Delta S°$ and $\Delta G°$ respectively ?
   (A) Joule/mole, Joule/sec/K, Joule/mole
   (B) Joule/K, Joule/K/mole, Joule/mole
   (C) Joule/mole, Joule/mole, Joule/K
   (D) Joule/mole, Joule/mole/K, Joule/mole
7. Considering the following electrolytic cell;
   $Zn(s) \mid ZnSO_4(aq) \parallel CuSO_4(aq) \mid Cu(s)$.
   The correct representation of the Nernst equation/s for this cell can be :
   (A) $E_{cell} = E^{\circ}_{cell} - 2.303\ RT/nF\ \log[Zn^{+2}(aq)]/[Cu^{+2}(aq)]$
   (B) $E_{cell} = E^{\circ}_{cell} + 2.303\ RT/nF\ \log[Cu^{+2}(aq)]/[Zn^{+2}(aq)]$
   (C) Both (A) & (B)
   (D) $E_{cell} = E^{\circ}_{cell} + 2.303\ RT/nF\ \log[Zn^{+2}(aq)]/[Cu^{+2}(aq)]$
8. A buffer is having pK value 4.7, if $[A^-]/[HA]$ is equal to 1, then the pH of buffer solution will be :
   (A) 3.7
   (B) 5.7
   (C) 4.7
   (D) 4.3
9. During photosynthesis, the photo oxidation of water takes place at the _____ catalytic site.
   (A) Zn_2CaO_5 cluster
   (B) Mn_4CaO_5 cluster
   (C) Mn_2CaO_5 cluster
   (D) Mg_2CaO_3 cluster
10. Photo respiratory reactions occur in :
   (A) Chloroplast
   (B) Peroxisome
   (C) Mitochondrion
   (D) All of the above

11. In case of C_3 cycle, when CO_2 combines with Ribulose-1,5 bi-phosphate, the first stable product formed is :
    (A) Glucose-6-phosphate
    (B) Glucose
    (C) 3-phosphoglycerate
    (D) 1,3 bi-phosphoglycerate
12. Rate of transpiration can be seen least during :
    (A) High atmospheric humidity
    (B) Dry environment
    (C) High wind velocity
    (D) High soil moisture
13. The rate at which solar energy is fixed by autotrophs is called as the :
    (A) Gross secondary productivity
    (B) Net primary productivity
    (C) Net secondary productivity
    (D) Gross primary productivity
14. Water pollution can be quantified by B.O.D. and C.O.D. values, which statement from the following is correct ?
    (A) C.O.D. is always equal to B.O.D.
    (B) C.O.D. is always greater than B.O.D.
    (C) C.O.D. is always less than B.O.D.
    (D) None of the above
15. All the following steps of Nitrogen cycle are useful for plants except :
    (A) Nitrification
    (B) Nitrogen fixation
    (C) Assimilation
    (D) Denitrification
16. Itai- itai disease was the name given to mass _____ poisoning of Toyama Prefecture Japan, starting around 1912.
    (A) Copper
    (B) Mercury
    (C) Cadmium
    (D) Zinc
17. Which of the following statements is incorrect :
    (A) Prions are protein particles capable of causing several human diseases
    (B) Kuru and Creutzfeldt-Jakob diseases are caused as a result of Prions
    (C) Prions contain a single stranded RNA
    (D) Prions are made up of a single sialoglyco protein called PrP 27-30
18. The most widely used molecular marker for the identification of bacteria is :
    (A) 18S rDNA
    (B) Cox-I
    (C) ISSII
    (D) 16S rDNA
19. Which type of association exists between *Penicillium* and *Staphylococcus* ?
    (A) Commensalism
    (B) Mutualism
    (C) Competition
    (D) Amensalism
20. Microbial fermentation of milk is used to produce several dairy products such as buttermilk etc., the microbe used for the production of buttermilk is :
    (A) *Streptococcus diacetylactis*
    (B) *Lactobacillus plantarum*
    (C) *Aspergillus niger*
    (D) *Saccharomyces cerevisiae*
21. Which of the following polysaccharide gives red coloration when treated with Iodine solution ?
    (A) Cellulose
    (B) Amylose
    (C) Glycogen
    (D) None of the above

22. Which among the following bonds has about 40% double bond character ?
(A) Glycosidic bond
(B) Peptide bond
(C) Phosphodiester bond
(D) Disulphide bond

23. Saponification number of a fat is providing information about the :
(A) Rancidity of a fat
(B) Size of the fatty acid chain present in a fat
(C) Presence of unsaturated fatty acids in a fat
(D) All of the above

24. Nucleic acids are absorbing maximally in UV region at 260 nm, because of the presence of :
(A) Purines and Pyrimidines
(B) Ribose/De-oxy ribose sugar moieties
(C) Phosphate group
(D) All of the above

25. In case of Enzyme classification and Nomenclature, the E.C. code words are used for identifying an enzyme, the E.C. code word for Hexose kinase is :
(A) EC : 2.1.1.7
(B) EC : 1.2.3.7
(C) EC : 3.1.1.27
(D) EC : 2.7.1.1

26. The catalytic efficiency of an enzyme is determined by :
(A) k_M only
(B) k_{cat} only
(C) k_{cat}/k_M ratio
(D) k_M/k_{cat} ratio

27. Sulpha drugs considered one of the effective antibiotics that inhibit the synthesis of folic acid, are the example of _____ inhibitors.
(A) Competitive
(B) Non-competitive
(C) Uncompetitive
(D) Irreversible

28. Which among the following statement/s is/are true about regulatory enzymes ?
(A) They produce sigmoidal curves
(B) They generally reflect cooperativity
(C) Both (A) & (B)
(D) Neither (A) nor (B)

29. Glucagon and epinephrine increase the cellular concentration of cAMP, an event that leads to phosphorylation and inactivation of glycogen synthase, in this context which among the following statement/s is/are true ?
(A) In liver both these hormones elevate cAMP
(B) In muscles epinephrine is primarily responsible
(C) Both (A) & (B)
(D) Neither (A) nor (B)

30. Glutathione is responsible for protection of RBCs from oxidative damage; the concentration of glutathione is maintained by NADPH produced during :
(A) Glycolysis
(B) Pentose phosphate pathway
(C) Krebs cycle
(D) Glycogenolysis

31. The rate limiting step in fatty acid synthesis is the formation of malonyl- CoA catalyzed by acetyl -CoA carboxylase, which type of regulation/s this type of enzyme undergoes ?
(A) Allosteric regulation
(B) Covalent regulation/modification
(C) Induction of enzyme synthesis
(D) All of the above

32. Which of the following statement is not true about Maple syrup urine disease ?
(A) It results due to defects in catabolism of branched chain amino acids
(B) It results due to defects in catabolism of aromatic amino acids
(C) It is a genetic disorder
(D) The symptoms appear early in infancy, death often occurs by 1 year of age

33. Which of the following statement is not true while differentiating plant cell from animal cell ?
(A) The presence of large vacuole
(B) The presence of lysosomes
(C) The absence of cellulosic cell wall
(D) The absence of chloroplast

34. Consider two names used for describing a cell without cell wall :
(1) Protoplast
(2) Symplast.
Select the correct one from the following options :
(A) (1) only
(B) (2) only
(C) Both (1) & (2)
(D) Neither (1) nor (2)

35. Presence of intact membrane system is must for synthesis of ATP for which organelle/s ?
(A) Mitochondria only
(B) Endoplasmic reticulum only
(C) Chloroplast only
(D) Chloroplast and Mitochondria

36. Which among the following phases of the cell cycle/division is arrested by the treatment of an alkaloid colchicine ?
(A) G_0 phase
(B) S phase
(C) G_2 phase
(D) M phase

37. DNA methylation is based on the methylation of cytosine base in the nuclear DNA by enzymes called as DNA methyl transferases, which among the following is active methyl group donor ?
(A) Methionine
(B) S-adenosyl methionine
(C) Methanol
(D) Acetic anhydride

38. Consider the following statements about Telomeres :
(1) These are specialized structures that protect chromosome ends.
(2) These ensure their faithful replication and prevent the shortening of chromosome during successive rounds of DNA synthesis.
(3) In *Arabidopsis* telomeres are 4-6 kb in length.
Select the correct one from the following options :
(A) (1) & (2) only
(B) (1), (2) & (3)
(C) (1) only
(D) (2) & (3) only

39. DNA polymerization requires RNA primers for the process to continue, which among the following enzymes remove these primers during polymerization ?
(A) Polymerase II
(B) Polymerase I
(C) Topoisomerase
(D) DNA helicase

40. A type of mutation that does not change the sequence of a polypeptide coded by that gene is called as the :
(A) Nonsense mutation
(B) Deletion
(C) Silent mutation
(D) Frame shift mutation

41. In case of Gel filtration chromatography, void volume of a column is determined by blue dextran, which is _____ in nature.
(A) Protein
(B) Polysaccharide
(C) Ganglioside
(D) Polynucleotide

42. Which type of gel electrophoresis is best suited for the separation and identification of nucleic acids ?
(A) Agarose gel electrophoresis
(B) PAGE
(C) SDS-PAGE
(D) None of the above

43. Theodore Svedberg is considered as the pioneer of _____ Technique.
(A) Chromatography
(B) Electrophoresis
(C) Centrifugation
(D) Radio immune assay

44. In case of I.R. spectroscopy, –OH group of alcohols absorbs strongly at :
(A) 3200–3600 cm^{-1}
(B) 2200–2600 cm^{-1}
(C) 1650–1710 cm^{-1}
(D) 1250–1350 cm^{-1}

45. Tick odd one out in context to circulatory system :
(A) Villi
(B) Capillaries
(C) Veins
(D) Arteries

46. Which cycle is involved in transport of amino acids ?
(A) Urea cycle
(B) Krebs cycle
(C) γ-glutamyl cycle
(D) None of the above

47. Tick odd one out with regard to functions of small intestines :
(A) It is a site of carbohydrate, protein and fat digestion
(B) It is a site of the majority of water absorption in the GI tract
(C) It is a first site of protein hydrolysis
(D) It carries most rapid absorption of galactose

48. Insulin acts through its receptor called as insulin receptor which is a :
(A) Protein with 4 subunits
(B) Protein with 2 subunits
(C) Glycolipid
(D) Lipopolysaccharide

49. Which of the following foods is having low biological value proteins ?
(A) Meat
(B) Fish
(C) Eggs
(D) Legumes

50. Normal reference values for serum CK-MB specific to myocardium is :
(A) 5 to 25 IU/L
(B) 7 to 56 IU/L
(C) 10 to 100 IU/L
(D) 0.5 to 2 IU/L

51. The role of Clinical Biochemists is to :
(A) Carry out the complex analyses on specimens of body fluids and tissues
(B) Assure the quality of clinical biochemistry investigations
(C) Audit the diagnostic and clinical use and performance of investigations
(D) All of the above

52. What is not correct about BMI (Body Mass Index) ?
(A) It provides information about the health status of an individual
(B) It ranges between (18.5-25) kg/m^2 for normal adult
(C) It is calculated as; BMI = $(Mass\ in\ kg)^2$/ (height in m)
(D) It is calculated as; BMI = (Mass in kg)/ $(height\ in\ m)^2$

53. What is not true about a Hapten ?
(A) It is a molecule that reacts with specific antibody but is not immunogenic by itself
(B) It can be made immunogenic by conjugation to a suitable carrier
(C) Many drugs like penicillins are haptens
(D) A hapten is essentially complete antigen

54. As phagocytes have receptors, called Fc receptors that bind the constant region and facilitate phagocytosis of the bacterium. The coating of pathogens and foreign particles in this way is known as :
(A) Opsonization
(B) Complement activation
(C) Neutralization
(D) None of the above

55. _____ is/are Japanese molecular biologist/s who won the Nobel Prize for Physiology or Medicine in 1987 for his/their discovery of the genetic principle for generation of antibody diversity.
(A) Katalin Karikó
(B) Drew Weissman
(C) Susumu Tonegawa
(D) All of the above

56. Which type of Hypersensitivity is mediated through IgE ?
(A) Type I hypersensitivity
(B) Type II hypersensitivity
(C) Type III hypersensitivity
(D) Type IV hypersensitivity

57. Recombinant DNA technology was introduced with the first recombinant product released in market as :
(A) Bt cotton
(B) Insulin produced from *E. coli*
(C) Flavr savr
(D) *Pseudomonas putida*

58. On which sequence BamH1 restriction enzyme acts ?
(A) 5′-GGATCC-3′
3′-CCTAGG-5′
(B) 5′-GAATTC-3′
3′-CTTAAG-5′
(C) 5′-CCCGGG-3′
3′-GGGCCC-5′
(D) 5′-GCTAGC-3′
3′-CGATCG-5′

59. Tick odd one out as per the requirements that are necessary for maintaining cell growth during animal cell cultures :
(A) Temperature of 37°C ± 0.5°C
(B) 5% carbon dioxide
(C) 95% humidity
(D) 20% nutrient agar medium

60. _____ vectors are designed to clone large fragments of DNA and to grow their DNA as a virus or as a plasmid.
(A) Plasmid
(B) Cosmid
(C) Yeast artificial chromosome
(D) None of the above