INSTRUCTIONS TO CANDIDATES

(Use only blue/black ball-point pen in the space above and on both sides of the Answer Sheet)

1. Within 30 minutes of the issue of the Question Booklet, check the Question Booklet to ensure that it contains all the pages in correct sequence and that no page/question is missing. In case of faulty Question Booklet bring it to the notice of the Superintendent/Invigilator immediately to obtain a fresh Question Booklet.

2. Do not bring any loose paper, written or blank, inside the Examination Hall except the Admit Card.

3. A separate OMR Answer Sheet is given. It should not be folded or mutilated. A second OMR Answer Sheet shall not be provided. Only the OMR Answer Sheet will be evaluated.

4. Write all entries by blue/black pen in the space provided above.

5. On the front page of the OMR Answer Sheet, write your Roll Number in the space provided at the top, and by darkening the circles at the bottom. Also, write the Question Booklet Number, Centre Code Number and the Set Number wherever applicable in appropriate places.

6. No overwriting is allowed in the entries of Roll No., Question Booklet No., and Set No. (if any) on OMR Answer sheet and Roll No. and OMR Answer sheet no. on the Question Booklet.

7. Any change in the aforesaid entries is to be verified by the invigilator, otherwise it will be taken as unfair means.

8. Each question in this Booklet is followed by four alternative answers. For each question, you are to record the correct option on the Answer Sheet by darkening the appropriate circle in the corresponding row of the Answer Sheet, by pen as mentioned in the guidelines given on the first page of the OMR Answer Sheet.

9. For each question, darken only one circle on the OMR Answer Sheet. If you darken more than one circle or darken a circle partially, the answer will be treated as incorrect.

10. Note that the answer once filled in ink cannot be changed. If you do not wish to attempt a question, leave all the circles in the corresponding row blank (such question will be awarded zero mark).

11. For rough work, use the inner back page of the title cover and the blank page at the end of this Booklet.

12. On completion of the Test, the candidate must handover the OMR Answer Sheet to the Invigilator in the examination room/shall. However, candidates are allowed to take away Test Booklet and copy of OMR Answer sheet with them.

13. Candidates are not permitted to leave the Examination Hall until the end of the Test.

14. If a candidate attempts to use any form of unfair means, he/she shall be liable to such punishment as deemed fit by the examining authority.
ROUGH WORK
रफ़ कार्य
No. of Questions: 120

Time: 2 Hours

[Full Marks: 360]

Note: (1) Attempt as many questions as you can. Each question carries 3 (Three) marks. One mark will be deducted for each incorrect answer. Zero mark will be awarded for each unattempted question.

(2) If more than one alternative answers seem to be approximate to the correct answer, choose the closest one.

1. Milk sugar is called

   (1) Glucose  (2) Lactose  (3) Sucrose  (4) Galactose

2. The z-DNA helix

   (1) Is the primary form in living organisms
   (2) Is favoured by an alternating G-C sequence
   (3) Is inhibited by the methylation of the bases
   (4) Is a permanent conformation of DNA

3. Which of the following is a characteristic of mitochondria?

   (1) The inner membrane forms cristae and contains small spheres attached by stalks on the inner surface
   (2) Mitochondria have no role in apoptosis
   (3) Mitochondrial DNA is similar to nuclear DNA in size and shape
   (4) Only the outer membrane has transmembrane systems for translocation of metabolites
4. Sorbitol is a
   (1) Reducing sugar  (2) Sugar alcohol
   (3) Sugar ester   (4) Glycoside

5. Chromosomes having equal or almost equal arms are known as
   (1) Metacentric  (2) Acrocentric
   (3) Centric     (4) Telocentric

6. The pentose sugar present in DNA is
   (1) Ribose      (2) Ribulose
   (3) Sucrose     (4) Deoxyribose

7. Which of the following cell organelle is considered to be rich in hydrolytic enzymes?
   (1) Endoplasmic reticulum   (2) Lysosomes
   (3) Golgi bodies            (4) Mitochondria

8. Ribosomes are the centers for
   (1) Respiration           (2) Photosynthesis
   (3) Protein synthesis     (4) Lipid synthesis

9. HDL is synthesized and secreted from
   (1) Liver                  (2) Muscle
   (3) Kidney                 (4) Pancreas

   (2) (Continued)
10. Xanthine oxidase is inhibited by
   (1) Aspirin
   (2) Probenecid
   (3) Allopurinol
   (4) Colchicicine

11. Osmosis is opposite to
   (1) Diffusion
   (2) Effusion
   (3) Affusion
   (4) Coagulation

12. A lipid bilayer is permeable to
   (1) Urea
   (2) Potassium
   (3) Glucose
   (4) Fructose

13. tRNA in mammalian cells is produced mainly in the
   (1) Nucleus
   (2) Nucleolus
   (3) Ribosome
   (4) Endoplasmic reticulum

14. The constituent unit of inulin is
   (1) Glucose
   (2) Fructose
   (3) Mannose
   (4) Galactose

15. Osazones are not formed with
   (1) Glucose
   (2) Fructose
   (3) Sucrose
   (4) Lactose

(Turn Over)
16. The active site of an enzyme

(1) Binds competitive inhibitors
(2) Is directly involved in binding of allosteric inhibitors
(3) Is formed after addition of a substrate
(4) Resides in a few adjacent amino acid residues in the primary sequence of the protein

17. Lactate dehydrogenase is

(1) Ligase
(2) Lyase
(3) Isomerase
(4) Oxidoreductase

18. Carbonic anhydrase is an example of

(1) Lipoprotein
(2) Phosphoprotein
(3) Chromoprotein
(4) Metalloprotein

19. The milk protein casein is

(1) Nucleoprotein
(2) Phosphoprotein
(3) Glycoprotein
(4) Chromoprotein

20. Renin converts casein to paracasein in presence of

(1) $\text{Ca}^{++}$
(2) $\text{Mg}^{++}$
(3) $\text{Na}^{+}$
(4) $\text{K}^{+}$

(Continued)
21. Pepsinogen is converted to pepsin by

   (1) HCl  (2) Bile salts  (3) Ca^{++}  (4) Enteroquinase

22. The immunoglobulin having the longest half-life is

   (1) IgA  (2) IgM  (3) IgG  (4) IgE

23. Complement fixation region can be activated by binding of antigen to

   (1) IgA  (2) IgD  (3) IgM  (4) IgE

24. Histidine is converted into histamine by

   (1) Decarboxylation  (2) Carboxylation  (3) Methylaction  (4) Hydroxylation

25. $NH_3$ is detoxified in brain as

   (1) Urea  (2) Uric acid  (3) Creatinine  (4) Glutamine

26. Which of the following protein is rich in cystine?

   (1) Keratin  (2) Collagen
   (3) Elastin  (4) Fibrin

   (5) (Turn Over)
27. Rancidity is due to the presence of
   (1) Cholesterol
   (2) Vitamin E
   (3) Lipid peroxides
   (4) Phenolic compounds

28. Dietary fibres are rich in
   (1) Cellulose
   (2) Starch
   (3) Glycogen
   (4) Proteoglycans

29. Lipid stores are mainly present in
   (1) Liver
   (2) Brain
   (3) Muscles
   (4) Adipose tissues

30. $\alpha$-oxidation of fatty acids occur mainly in
   (1) Liver
   (2) Brain
   (3) Muscles
   (4) Adipose tissues

31. Hypocholesterolemia can occur in
   (1) Hyperthyroidism
   (2) Diabetes mellitus
   (3) Nephrotic syndrome
   (4) Obstructive Jaundice

32. Hippuric acid is formed from
   (1) Benzoic acid and alanine
   (2) Benzoic acid and glycine
   (3) Glucuronic acid and alanine
   (4) Glucuronic acid and glycine

(Continued)
33. Ketone bodies are synthesized in
   (1) Liver
   (2) Kidney
   (3) Heart
   (4) Intestine

34. Which of the following is not an essential fatty acid?
   (1) Linoleic acid
   (2) Linolenic acid
   (3) Arachidonic acid
   (4) Oleic acid

35. The key regulatory enzyme in cholesterol biosynthesis is
   (1) HMG CoA synthetase
   (2) HMG CoA reductase
   (3) Squalene synthetase
   (4) Mevalonate kinase

36. The most active metabolite of vitamin D is
   (1) 25-hydroxycholecalciferol
   (2) 1,25-dihydroxycholecalciferol
   (3) 24,25-dihydroxycholecalciferol
   (4) 1,25,26-trihydroxycholecalciferol

37. Vitamin K is found in
   (1) Green leafy vegetables
   (2) Meat
   (3) Fish
   (4) Milk

(Turn Over)
38. Tocopherols prevent the oxidation of
   (1) Vitamin A  (2) Vitamin C
   (3) Vitamin D  (4) Vitamin K

39. Retinoic acid is involved in the synthesis of
   (1) Rhodopsin  (2) Iodopsin
   (3) Porphyrinopsin  (4) Glycoproteins

40. Folate deficiency causes
   (1) Microcytic anemia  (2) Hemolytic anemia
   (3) Iron deficiency anemia  (4) Megaloblastic anemia

41. Which of the following ion activates salivary amylase activity?
   (1) Sodium  (2) Potassium
   (3) Chloride  (4) Bicarbonate

42. Mitochondrial membrane is freely permeable to
   (1) Pyruvate  (2) Malate
   (3) Oxaloacetate  (4) Fumarate

43. The source of all the carbon atoms of cholesterol is
   (1) Acetyl CoA  (2) Bicarbonate
   (3) Succinyl CoA  (4) Propionyl CoA

     (8)  
(Continued)
44. The enzyme hexokinase is a
   (1) Hydrolase
   (2) Oxidoreductase
   (3) Transferase
   (4) Ligase

45. Lactate dehydrogenase is a
   (1) Monomer
   (2) Dimer
   (3) Tetramer
   (4) Hexamer

46. An allosteric inhibitor of pyruvate dehydrogenase is
   (1) Acetyl CoA
   (2) ATP
   (3) NADH
   (4) Pyruvate

47. Which of the following carbohydrates would be most abundant in the diet of strict vegetarians?
   (1) Amylose
   (2) Lactose
   (3) Cellulose
   (4) Maltose

48. Which of the following antibody can cross the placenta?
   (1) IgA
   (2) Ig E
   (3) Ig G
   (4) Ig M

49. The immunoglobulins are classified on the basis of
   (1) Light chains
   (2) Heavy chains
   (3) Carbohydrate content
   (4) Electrophoretic mobility

   (Turn Over)
50. The trace element catalyzing hemoglobin synthesis is
   (1) Manganese               (2) Magnesium
   (3) Copper                  (4) Selenium

51. A nonspecific intracellular antioxidant is
   (1) Chromium                (2) Magnesium
   (3) Nickel                  (4) Selenium

52. During an overnight fast, the major source of blood glucose is
   (1) Gluconeogenesis
   (2) Hepatic glycogenolysis
   (3) Muscle glycogenolysis
   (4) Dietary glucose from the intestine

53. Pantothenic acid is a constituent of the coenzyme involved in
   (1) Acetylation              (2) Decarboxylation
   (3) Oxidation                (4) Reduction

54. An amino acid required for porphyrin synthesis is
   (1) Proline                 (2) Glycine
   (3) Serine                  (4) Histidine
55. Iron is transported in blood in the form of
   (1) Ferritin          (2) Haemosiderin
   (3) Transferrin       (4) Haemoglobin

56. Specific Dynamic Action (SDA) of protein is about
   (1) 5%          (2) 13%          (3) 20%          (4) 30%

57. The principal cation of extracellular fluid is
   (1) Na⁺         (2) K⁺          (3) H⁺          (4) Ca²⁺

58. A hormone used for the detection of pregnancy is
   (1) Estrogen     (2) Progesterone
   (3) Oxytocin    (4) Chorionic gonadotropin

59. Somatotropin is secreted by
   (1) Hypothalamus (2) Anterior pituitary
   (3) Posterior pituitary (4) Thyroid gland

60. Insulin stimulates
   (1) Hepatic glycogenolysis (2) Hepatic glycogenesis
   (3) Lipolysis           (4) Gluconeogenesis
61. A hormone which cannot cross the blood-brain barrier is
   (1) Epinephrine          (2) Aldosterone
   (3) ACTH                  (4) TSH

62. Which of the following compound serves as a primary link between the citric
    acid cycle and the urea cycle?
   (1) Malate          (2) Succinate
   (3) Fumarate        (4) Citrate

63. Which of the following is a coenzyme?
   (1) Glucose-6-phosphate  (2) Calcium ion
   (3) Lipoic acid         (4) UDP-glucose

64. The major source of extracellular cholesterol for human tissues is
   (1) Low density lipoproteins
   (2) Very low density lipoproteins
   (3) High density lipoproteins
   (4) Albumin

65. Purine nucleotide biosynthesis can be inhibited by
   (1) Adenosine monophosphate
   (2) Uridine monophosphate
   (3) Adenosine triphosphate
   (4) Guanosine triphosphate

(12) (Continued)
66. The direction of a chemical reaction is best predicted by

(1) Enthalpy change
(2) Entropy change
(3) Free energy change
(4) Energy of activation change

67. The cell theory is not applicable to

(1) Bacteria
(2) Algae
(3) Virus
(4) Fungi

68. Extracellular DNA is found in

(1) Nucleus
(2) Ribosome
(3) Chloroplast
(4) Endoplasmic reticulum

69. Prokaryotic cells does not possess

(1) Cell wall
(2) Cytoplasm
(3) Nuclear membrane
(4) Plasma membrane

70. Plasma membrane is composed of

(1) Protein
(2) Lipids
(3) Cellulose
(4) Protein and lipids
71. Ribosomes help in
   (1) Protein synthesis
   (2) Photosynthesis
   (3) Lipid synthesis
   (4) Respiration

72. All of the following classes of lipids are components of biological membranes except
   (1) Cholesterol
   (2) Phospholipids
   (3) Glycolipids
   (4) Triacylglycerols

73. The main function of centrosome is
   (1) Secretion
   (2) Osmoregulation
   (3) Protein synthesis
   (4) Formation of spindle fibre

74. Fungus without mycelium is
   (1) Puccinia
   (2) Rhizopus
   (3) Saccharomyces
   (4) Mucor

75. Double fertilization is found in
   (1) Bryophytes
   (2) Angiosperms
   (3) Gymnosperms
   (4) Pteridophytes
76. Xanthophyll is a pigment containing
   (1) Yellow color  (2) Green color
   (3) Red color    (4) Blue color

77. Peroxisomes and glyoxisomes are
   (1) Energy transducers (2) Membrane-less organelles
   (3) Microbodies      (4) Basal bodies

78. Dictyosome is also known as
   (1) Golgi apparatus  (2) Ribosome
   (3) Lysosome        (4) Peroxisome

79. The vitamin which is essential for blood clotting is
   (1) Vitamin A       (2) Vitamin B
   (3) Vitamin C       (4) Vitamin K

80. Kupffer cells are present in
   (1) Liver          (2) Small intestine
   (3) Pancreas       (4) Thyroid gland

81. Retroviruses have
   (1) Only RNA as genetic material
   (2) Only DNA as genetic material
   (3) Both DNA and RNA as genetic material
   (4) Genes on nucleoprotein complexes as genetic material

(15)
82. A prominent prebiotic substance is

(1) Starch                  (2) Cellulose
(3) Pectin                  (4) Fructooligosaccharide

83. Which one of the following is a cobalt containing vitamin?

(1) Vitamin B₂            (2) Vitamin B₃
(3) Vitamin B₆            (4) Vitamin B₁₂

84. E.coli bacteria are beneficial to human because they

(1) Convert pepsinogen to pepsin
(2) Absorb water from the large intestine
(3) Produce vitamins and amino acids
(4) Synthesize urea from the breakdown of amino acids

85. The specificity of an antibody against an antigen is determined by

(1) The amino acid loops in its variable domain
(2) The amino acid loops in its constant domain
(3) The concentration of antibodies and antigens
(4) The Y-shaped structure of immunoglobulins

86. α-amanitin inhibits

(1) RNA polymerase I      (2) RNA polymerase II
(3) DNA polymerase I      (4) DNA polymerase II

(16)
87. *Hydroxylation of proline and lysine in collagen molecule requires*
   
   (1) Vitamin D  
   (2) Vitamin K  
   (3) Vitamin C  
   (4) Vitamin E  

88. *Sickle cell anemia occurs due to*

   (1) Silent mutation  
   (2) Missense mutation  
   (3) Nonsense mutation  
   (4) Frameshift mutation  

89. *Enzyme required to release the tension imposed by uncoiling of DNA strand is*

   (1) DNA helicase  
   (2) DNA ligase  
   (3) DNA gyrase  
   (4) Endonuclease  

90. If the DNA sequence is ATG, the sequence of bases in anticodon t-RNA would be

   (1) CAU  
   (2) AUG  
   (3) TAC  
   (4) UAC  

91. *The non-reducing sugar is*

   (1) Glucose  
   (2) Sucrose  
   (3) Lactose  
   (4) Maltose  

92. All of the following polysaccharides contain glucose, except

   (1) Glycogen  
   (2) Starch  
   (3) Inulin  
   (4) Cellulose
93. All of the following are amphipathic molecule except

(1) Cholesterol
(2) Glycolipids
(3) Phospholipids
(4) Triacylglycerols

94. Which one of the following molecule act as local hormone?

(1) Essential fatty acids
(2) Prostaglandins
(3) Cholesterol
(4) Phospholipids

95. Which region of mRNA contains Shine-Dalgarno sequence?

(1) 5' untranslated region
(2) 3' untranslated region
(3) Protein coding region
(4) Promotor region

96. $\alpha$-D glucose and $\beta$-D glucose are

(1) Epimers
(2) Anomers
(3) Optical isomers
(4) Keto-aldose isomers

97. Photosynthesis is a

(1) Reductive, endergonic and catabolic process
(2) Reductive exergonic and anabolic process
(3) Reductive, endergonic and anabolic process
(4) Reductive, exergonic and catabolic process
98. Which one of the following proteins are associated with DNA structure?

(1) Albumins  (2) Globulins
(3) Collagen   (4) Histones

99. The natural reservoir of Ebola virus is

(1) Fruit bat  (2) Dog
(3) Pig       (4) Sheep

100. The Southern blot technique is used for

(1) The detection of RNA fragments on membranes by specific radioactive antibodies

(2) The detection of DNA fragments on membranes by a radioactive DNA probe

(3) The detection of proteins on membranes using a radioactive DNA probe

(4) The detection of DNA fragments on membranes by specific radioactive antibodies

101. Digestive enzymes are

(1) Transferases  (2) Hydrolases
(3) Lyases       (4) Ligases

102. Cholecalciferol is synthesized in the skin by photolysis from

(1) Ergosterol  (2) Lanosterol
(3) Cholesterol (4) 7-dehydrocholesterol

(19)

(Turn Over)
103. Biotin takes part in
   (1) Transamination reactions    (2) Decarboxylation reactions
   (3) Carboxylation reactions     (4) Deamination reactions

104. The main function of superoxide dismutase is to
   (1) Catalyze the conversion of $O_2$ to $H_2O_2$ and $O_2$
   (2) Create superoxides by oxidizing heme
   (3) Convert $H_2O_2$ to water and $O_2$
   (4) Remove $H_2O_2$ by oxidizing glutathione and producing water

105. In the biosynthesis of c-DNA, the joining enzyme ligase requires
   (1) ATP    (2) GTP    (3) CTP    (4) UTP

106. Heparin is a
   (1) Lipopolysaccharide            (2) Glycated lipopolysaccharide
   (3) Sulphated polysaccharide      (4) Sulphated lipopolysaccharide

107. Fish can survive inside a frozen lake because
   (1) Fish hibernate in ice
   (2) Fish are warm blooded animals
   (3) Ice is a good conductor of heat
   (4) Water near the bottom does not freeze

   (20) (Continued)
108. Asparaginase is used as an
   (1) Anti-tumor agent       (2) Anti-tuberculosis agent
   (3) Anti-malarial agent    (4) Anti-diabetic agent

109. Which of the following enzyme does not require a primer?
   (1) RNA dependent DNA polymerase
   (2) DNA dependent DNA polymerase
   (3) DNA dependent RNA polymerase
   (4) Taq DNA polymerase

110. Glycosylation of proteins occurs in the
   (1) Mitochondria           (2) Endoplasmic reticulum
   (3) Lysosome               (4) Peroxisome

111. Which of the following amino acids is coded by maximum number of codons?
   (1) Alanine                (2) Leucine
   (3) Tryptophan             (4) Valine

112. Telomeric DNA does not contain
   (1) AT rich sequences      (2) G-rich sequences
   (3) T and D loops          (4) Quadruplex

(21)

(Turn Over)
113. The double-helical Watson-Crick structure of DNA was first obtained from
   (1) X-ray diffraction from single crystals
   (2) Diffraction from single crystals and molecular modeling
   (3) Fiber diffraction only
   (4) Fiber diffraction and molecular modeling

114. Genes related through descent from a common ancestral gene are called
   (1) Homologous
   (2) Heterologous
   (3) Orthologous
   (4) Paralogous

115. Competitive inhibition of an enzyme by a competitive inhibitor can be overcome by simply
   (1) Increasing the concentration of substrate
   (2) Decreasing the concentration of substrate
   (3) Increasing the temperature of reaction
   (4) Decreasing the temperature of reaction

116. Which one of the following receptors perceives blue light in plants?
   (1) Phytochrome
   (2) Cryptochrome
   (3) Phototropin
   (4) Photopsin

(Continued)
117. Warburg effect is characterized by
   (1) Increased glycolysis          (2) Decreased glycolysis
   (3) Absence of glycolysis         (4) Malfunctional glycolysis

118. Deoxy UMP is converted to TMP by
   (1) Methylation                   (2) Carboxylation
   (3) Decarboxylation               (4) Deamination

119. Opsonization process is involved with
   (1) T cells                       (2) B cells
   (3) Neutrophils                   (4) Macrophages

120. In gel filtration chromatography
   (1) The small protein will be eluted first
   (2) The large protein will be eluted first
   (3) Both large and small will elute at the same time
   (4) The small protein with high charge will be eluted first
ROUGH WORK
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