SET A

B.Sc. BIOTECHNOLOGY
FIRST SEMESTER [SPECIAL REPEAT]
BIOCHEMISTRY & METABOLISM
BBT-101
[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs. **Full Marks: 70**

Objective

Time: 30 mins. **Marks: 20**

Choose the correct answer from the following: ***1×20=20***

1. The backbone of DNA is:
   a. Hydrophilic
   b. Hydrophobic
   c. Neutral
   d. Both hydrophilic and hydrophobic

2. Molecular formula of pamitic acid is:
   a. $C_{10}H_{20}O_2$
   b. $C_{16}H_{32}O_2$
   c. $C_{12}H_{24}O_2$
   d. $C_8H_{16}O_2$

3. What is produced in the light reaction of photosynthesis?
   a. ATP and NADPH
   b. Glucose
   c. CO_2
   d. H_2O

4. Ramachandran plot is used for:
   a. Predicting the structure of an enzyme
   b. Predicting the structure of a protein
   c. Predicting the secondary of proteins from primary sequence
   d. All the above

5. LB plot is used to determine:
   a. Specificity of an enzyme
   b. Enzyme kinetics
   c. Nomenclature of an enzyme
   d. Inborn errors of metabolism

6. The basic repeating unit of a DNA molecule is:
   a. Nucleoside
   b. Nucleotide
   c. Histones
   d. Amino acids

7. During one Kreb cycle number of carbondioxide molecules released is:
   a. 1
   b. 2
   c. 3
   d. 4

8. Cyclic photophosphorylation results in the formation of:
   a. ATP
   b. NADPH
   c. ATP and NADPH
   d. ATP,NADPH and Oxygen

9. Lyases,a class of enzyme, catalyses:
   a. Hydrolysis reaction
   b. Group transfer reaction
   c. Oxidation and reduction reaction
   d. Addition of groups to double bond and vice versa

10. The overall equation for the aerobic cellular respiration of glucose is:
    a. $CO_2+H_2O \rightarrow C_6H_{12}O_6+O_2+ATP+Heat$
    b. $C_6H_{12}O_6+O_2 \rightarrow CO_2+H_2O+ATP+Heat$
    c. $C_6H_{12}O_6 \rightarrow$ Lactic acid+ATP+Heat
    d. $C_6H_{12}O_6 \rightarrow CO_2$+Ethyl alchohol+ATP+Heat

11. What is the nature of an enzyme?
    a. Vitamin
    b. Lipid
    c. Carbohydrate
    d. Protein

12. Out of the following the one having highest redox potential is:
    a. Ubiquinone
    b. O_2
    c. FMN
    d. NAD

13. All of the reactant will be converted to products:
    a. Will never reach equilibrium
    b. Will not occur spontaneously
    c. Will proceed at a rapid rate
    d. Will proceed at a rapid rate

14. What is the maximum wavelength that Tryptophan and tyrosine absorb?
    a. 280nm
    b. 260nm
    c. 257nm
    d. 230nm

15. Sphingomyelins are found in:
    a. Muscles
    b. Nephrons
    c. Brain tissues
    d. Hepatocytes

16 Metal ions that temporary binds substrate and active site of 'enzyme' is called:
    a. Inhibitors
    b. Coenzymes
    c. Prosthetic group
    d. Cofactors

17. Glycerol is required for the formation of all the following except:
    a. Glucose
    b. Triacylglycerol
    c. Phospholipids
    d. Glycolipids

18. If energy releases excessively in environment, having less energy products than reactants, resulting reaction is called:
    a. Redox reaction
    b. Thermodynamics
    c. Exergonic reaction
    d. Endergonic reaction

19. Arrangement of nucleotides in DNA can be seen by:
    a. Ultracentrifuge
    b. X-Ray crystallography
    c. Light microscope
    d. Electron microscope

20. A short length of DNA molecule has 80 thiamine and 80 guanine bases. The total number of nucleotide in the DNA fragment is:
    a. 160
    b. 40
    c. 320
    d. 640

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Descriptive

Time : 2 hr. 30 mins. **Marks : 50**

[Answer question no.1 & any four (4) from the rest]

1. Define carbohydrates. Write a note on their classification. 3+7=10
2. What are enzymes? Describe their classification and nomenclature. 3+7=10
3. a) Write short note on zwitter ions. 5+5=10
   b) Write short note on peptide bonds.
4. Describe in detail: 5+5=10
   a) Embden Mayorhoff Pathway (EMP)
   b) TCA cycle
5. Define proteins. Write a note on their classification. 6+4=10
6. a) What are lipids? How are they classified? 5+5=10
   b) Write the reaction involved when fatty acid is reacted with alkali.
7. a) Write the structure of a DNA and write a note on the two type bonds present within them to maintain their structure. 10
   b) What are the various factors responsible for the denaturation of DNA?
8. Write a short note on: 5+5=10
   a) Vitamin B12
   b) Lipoic acid

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