

(3 Hours)

[Total Marks: 75]

- N.B.:** 1. All questions are compulsory
2. Figures to right indicate full marks

Q. 1 Choose appropriate option for following multiple choice-based questions. 20

- 1 The amino acid, which contains sulphur is _____.
 - a Methionine
 - b Serine
 - c Glycine
 - d Leucine
- 2 What is the standard free energy change of ATP?
 - a Small and negative
 - b Large and positive
 - c Large and negative
 - d Small and positive
- 3 A reaction, which proceeds with net release of free energy and is spontaneous, is called as _____.
 - a Endergonic reaction
 - b Exergonic reaction
 - c Endothermic reaction
 - d Exothermic reaction
- 4 Which of the following is correct about Krebs Cycle?
 - a Pyruvate condenses with Oxaloacetate to form Citrate
 - b Alpha ketoglutarate is a five Carbon compound
 - c Oxidative Phosphorylation occurs in the cytoplasm only
 - d Krebs cycle can operate in anaerobic condition
- 5 Gluconeogenesis involves conversion of _____.
 - a Glucose-6-Phosphate to Fructose-6-Phosphate
 - b Pyruvate to Lactate
 - c Pyruvate to Acetyl CoA
 - d Oxaloacetate to Phosphoenolpyruvate
- 6 Which of the following is a debranching enzyme?
 - a Glycogen synthetase
 - b Glucose-6-phosphatase
 - c Amylo 1,6 glucosidase
 - d Amylo 1,4-1,6 transglycosylase

- 7 Final acceptor of electrons in ETC is
- a Cyt c
 - b Oxygen
 - c FADH₂
 - d CoQ
- 8 Pyruvate is converted to acetyl CoA by _____.
- a Oxidative Phosphorylation
 - b Oxidative decarboxylation
 - c Oxidative carboxylation
 - d Oxidative dephosphorylation
- 9 Number of ATP formed by oxidation of one molecule of palmitic acid is
- a 146
 - b 106
 - c 134
 - d 34
- 10 Conversion of acetoacetate to acetone is the step involved in
- a ketogenesis
 - b urea cycle
 - c glycolysis
 - d HMP shunt
- 11 Argininosuccinic aciduria is a recessive disease due to lack of _____ enzyme.
- a argininosuccinate lyase
 - b argininosuccinase
 - c arginase
 - d arginine transcarbamylase
- 12 Dopamine is synthesized from _____.
- a tyrosine
 - b tryptophan
 - c threonine
 - d lysine
- 13 Hydrolases enzymes are involved in _____.
- a Oxidation reduction reaction
 - b Hydrolysis reaction
 - c Isomerization reaction
 - d Addition or removal group reaction

- 14 If K_m changes and V_{max} remains the same. What is the type of enzyme inhibition?
- Competitive Inhibition
 - Noncompetitive Inhibition
 - Uncompetitive inhibition
 - Suicide Inhibition
- 15 Puromycin is a drug that interferes with _____.
- Protein synthesis
 - Nucleotide synthesis
 - DNA replication
 - RNA synthesis
- 16 Genetic lack of _____ causes Lesch Nyhan syndrome.
- Hypoxanthine guanine phosphoribosyl transferase
 - Adenine phosphoribosyl transferase
 - Adenine deaminase
 - Guanine deaminase
- 17 AUG serves as
- Start codon
 - Non-sense codon
 - Stop codon
 - Anticodon
- 18 In DNA replication _____ is responsible for removal of supercoiling as the replication fork moves ahead.
- Topoisomerase
 - Primase
 - Ligase
 - Helicase
- 19 The role of sigma factor present in bacterial RNA polymerase is
- Positioning of RNA polymerase correctly on DNA template
 - Catalyzing RNA synthesis
 - Terminating RNA synthesis
 - Separating the two strands of DNA
- 20 Which enzyme is a part of urea cycle?
- ornithine transcarbamoylase
 - Asparaginase
 - Glutamate synthase
 - gluatamine transaminase

Q. 2 Answer any two questions. 20

- a**
- i) Elaborate in detail the regulatory steps of glycolysis with respect to name and structure of intermediates, enzymes and cofactors. **6**
 - ii) Discuss ketogenesis w.r.t reactions and regulation. **4**
- b**
- i) Outline reactions involved in conversion of AMP to IMP and write a note on salvage pathway for purines. **6**
 - ii) Explain in brief about initiation and elongation steps in prokaryotic replication. **4**
- c**
- i) Discuss Michaelis Menten and line Weaver Burk plot with respect to enzyme inhibitors. **6**
 - ii) Explain the terms i) spontaneous reaction, ii) activation energy iii) ΔG iv) Entropy **4**

Q. 3 Answer any seven questions 35

- i) Write a note on secondary structure of proteins. Draw structure of Lecithin.
- ii) Classify carbohydrates based on their structure and chemical nature. Give structure of lactose.
- iii) Give the names and structures of substrate and product for the reactions catalysed by following enzymes.
 - a) Lactonase, b) Pyruvate kinase.
- iv) Explain various steps involved in glycogenolysis.
- v) Write a note on carnitine shuttle. Explain the energetics for β oxidation of palmitic acid
- vi) Explain β oxidation of palmitic acid with energetics.
- vii) Explain the biosynthesis of adrenaline with its significance.
- viii) Outline the synthesis of CTP from orotate. Write a note on treatment of gout.
- ix) Discuss the IUB classification of enzymes with suitable examples.