2 ½ Hours **Total Marks: 75**

1. Attempt **all** questions.
2. **All questions** carry **equal** marks.
3. Draw **neat labeled diagrams** wherever necessary.
4. Use of **log tables** and **non-programmable calculator** is **allowed**.
5. For **Q 2, Q 3 and Q 4** attempt A and B **OR** C and D.

Q 1 Do as directed (Any fifteen) **15**

1. Precursor amino acid for biosynthesis of serotonin is _____.
2. Synthesis of glucose from non-carbohydrate precursors is accomplished by a pathway called _____.
3. The number of NADPH produced when one molecule of Glucose 6-phosphate completes oxidative phase of HMP shunt is _____.
4. Give one example of glucogenic amino acid.
5. Name one enzyme of Glyoxalate cycle that is not present in vertebrates.
6. Name the organ in which urea is produced in humans.
7. Give one example of energy rich compound.
8. State True / False: Non-oxidative deamination of histidine releases ammonia.

Write the equation for the reaction catalysed by following enzymes: -

9. Citrate synthase.
10. Glutamate dehydrogenase.

Name the enzyme that catalyses the conversion of following reactions: -

11. Arginine to ornithine.
12. Glyceraldehyde 3-phosphate to 1,3-bisphosphoglycerate.
13. The reactions of ketone body formation occur in the matrix of ……

    a. kidney mitochondria b. liver mitochondria

    c. kidney cytosol d. liver cytosol
14. The absence of Hypoxanthine-Guanine Phosphoribosyl Transferase activity is observed in _____.

    a. Lesch-Nyhan syndrome b. Zellweger syndrome

    c. Refsum's disease d. X-linked adrenoleukodystrophy

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15. _____ are lipid-binding proteins in the blood which transports triacylglycerols, phospholipids, cholesterol, and cholesteryl esters between organs.

a. Apolipoproteins b. Lipases

c. Carboxylases d. Chylomicrons

16. The fatty acyl group is enzymatically transferred from Carnitine to intra-mitochondrial Coenzyme A by _____.

a. Carnitine Acyltransferase II, b. Lipase,

b. Carboxylase, d. Carnitine Acyltransferase I

17. Propionyl-CoA is first carboxylated to form the D stereoisomer of methyl malonyl-CoA by _____ .

a. Propionyl-CoA Carboxylase, b. Methylmalonyl-CoA Epimerase,

c. Methylmalonyl-CoA Mutase, d. Thiolase

18. Branched fatty acids are catabolized in peroxisomes of animal cells by

a. ω oxidation b. α oxidation c. β oxidation d. μ oxidation

19. Phosphorylation of _____ permits hormone sensitive lipase access to the surface of the lipid droplet.

a. perilipin b. triacylglycerols c. carnitine d. acyl-CoA

20. The overall equation of Palmitoyl-CoA beta oxidation is:

Palmitoyl-CoA + 7CoA + 7FAD + 7NAD^+ + 7H_2O
→ _____ + 7$FADH_2$ + 7NADH + 7H^+

a. 8 Acetyl-CoA b. 7 Acetyl-CoA

c. 14 Acetyl-CoA d. 16 Acetyl-CoA

Q. 2 A Discuss the reactions involved in the non-oxidative phase of the pentose phosphate pathway. **08**

Q. 2 B Explain the regulation of glycolysis pathway. **07**

OR

Q. 2 C With the help of a neat labelled diagram explain the structure and mechanism of rotary motor model for ATP generation. **08**

Q. 2 D Describe the Glyoxalate cycle and add a note on its significance. **07**

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Q. 3 A	Justify: Amino acids are degraded to metabolites that integrate into Krebs cycle.	**08**
Q. 3 B	Discuss the metabolic disorders associated with defects in urea cycle.	**07**
	OR	
Q. 3 C	Describe the mechanism of Transamination of amino acids.	**08**
Q. 3 D	Explain the structure of glutathione and state its significance.	**07**
Q. 4 A	Describe beta oxidation of saturated fatty acids.	**08**
Q. 4 B	Give detailed account of Purine catabolism.	**07**
	OR	
Q. 4 C	Elaborate reactions involved in the α-oxidation of a branched-chain fatty acid.	**08**
Q. 4 D	Explain three additional reactions involved in complete oxidation of odd number fatty acid.	**07**
Q. 5	Write Short notes on **any three** of the following:	**15**
a.	Metabolic disorders associated with pentose phosphate pathway.	
b.	Role of coenzyme Q in ETC.	
c.	Non oxidative deamination.	
d.	Role of Cyclic AMP–dependent protein kinase (PKA) in triacylglycerol mobilization.	
e.	ω- oxidation of fatty acid.	