AU–96

B.Sc. Part–II (Semester–III) Examination

3S : BIOCHEMISTRY

(Intermediary Metabolism)

Time : Three Hours] [Maximum Marks : 80

N.B. :— (1) **All** questions are compulsory and carry equal marks except question no. 1 which carries 8 marks.

(2) Draw the structure of intermediate compounds while describing metabolic pathways.

1. (A) Fill in the blanks :

(i) _____ is regenerated in the last reaction of urea cycle. ½

(ii) _____ is a key regulatory enzyme of glycogen breakdown. ½

(iii) _____ is the end product of glycogen breakdown in muscles. ½

(iv) _____ is a first complex of electron transport chain. ½

(B) Choose the correct alternative :

(i) Cytoplasmic HMG COA is used for synthesis of :

(a) Ketone bodies (b) Cholesterol

(c) Both (a) and (b) (d) None of above ½

(ii) Which of the following is a key regulatory enzyme of fatty acid biosynthesis ?

(a) Acetyl COA carboxylase (b) Hexokinase

(c) Condensing enzyme (d) Transacylase ½

(iii) Ribonucleotide reductase is involved in synthesis of :

(a) Deoxyribonucleotide (b) RNA

(c) Ribosomes (d) None of above ½

(iv) Which of the following intermediate of TCA cycle is used in biosynthesis of Heme ?

(a) Isocitrate (b) Succinate

(c) Succinyl COA (d) Fumarate ½

(C) Answer in **one** sentence :

(i) Draw the structure of methionine and cysteine. 1

(ii) Define glycogenolysis. 1

(iii) Define oxidative phosphorylation. 1

(iv) Define salvage pathway of nucleotide biosynthesis. 1

2. Answer the following :

(a) Explain regulation of glycogen metabolism. 4

(b) Describe investment phase of glycolysis. 4

(c) Explain in brief mechanism of oxidative phosphorylation. 4

OR

(p) Describe NADH and $FADH_2$ generating steps of TCA cycle. 4

(q) Describe oxidative phase of HMP shunt. 4

(r) Explain the reaction of Gluconeogenesis distinct from glycolysis. 4

3. Answer the following :

(a) Explain with reaction hydrolysis of Triacylglycerol. 4

(b) Describe transport of fatty acid into mitochondrial matrix. 4

(c) Describe Biosynthesis of saturated fatty acid. 4

OR

(p) Describe biosynthesis of fats. 4

(q) Explain β-oxidation of fatty acids. 4

(r) Describe synthesis of ketone bodies. 4

4. Answer the following :

(a) Describe biosynthesis of cephalin and lecithin. 4

(b) Explain biosynthesis of gangliosides. 4

(c) Describe biosynthesis of sphingomyelin. 4

OR

(p) Describe biosynthesis of mevalonate. 4

(q) Explain regulation of cholesterol biosynthesis. 4

(r) Describe biosynthesis of cholesterol from mevalonate. 4

5. Answer the following :

(a) Describe transamination and decarboxylation of amino acids. 4

(b) Describe urea cycle. 4

(c) Describe biosynthesis of methionine. 4

OR

(p) Describe biosynthesis of serine and glycine. 4

(q) Describe biosynthesis of phenylalanine starting from chorismate. 4

(r) Explain catabolism of cysteine. 4

6. Describe in detail de novo biosynthesis of AMP and GMP. 12

OR

Explain de novo biosynthesis of CTP and UTP and add a note on catabolism of purines in humans. 12

7. Describe in detail biosynthesis of Heme. 12

OR

Explain degradation of heme and add a note on bile pigment and jaundice. 12