AT–339

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

3S : BIOCHEMISTRY

(Intermediary Metabolism)

Time : Three Hours] [Maximum Marks : 80

Note :—(1) **ALL** questions are compulsory and carry equal marks except Q. No. **1** which carries **8** marks.

(2) Draw a well labelled diagram wherever necessary.

1. (A) Fill in the blanks :

(i) _____ catalyzes first reaction of glycosis. ½

(ii) _____ is the main regulatory enzyme of cholesterol biosynthesis. ½

(iii) _____ coenzyme is required in transamination reaction. ½

(iv) Carnitine protein is involved in transport of ___ _ into mitochondrial matrix. ½

(B) Choose the correct alternative :

(i) Uric acid synthesis mainly occurs in : ½

(A) Muscle (B) Kidney

(C) Liver (D) Bone Marrow

(ii) The link between TCA cycle and Urea cycle is through : ½

(A) Citrate (B) Fumarate

(C) Urea (D) Oxaloacetate

(iii) Acetyl CoA carboxylase is activated by : ½

(A) Citrate (B) Insulin

(C) Both of the above (D) Neither of the above

(iv) Glycine is required for the formation of all the following except : ½

(A) Porphyrins (B) Creatine

(C) Glutathione (D) Pyrimidines

(C) Answer in one sentence :

(i) Why humans can not convert fats into carbohydrate ? 1

(ii) Define glycogenolysis. 1

(iii) What is de novo pathway of synthesis of purines ? 1

(iv) What is anemia ? 1

2. (a) Describe regulation of glycolysis. 4

(b) Explain formation of succinyl CoA from Acetyl CoA and oxaloacetate in TCA cycle. 4

(c) Describe in brief glycogenolysis. 4

OR

(p) Explain in brief electron transport chain. 4

(q) Describe non-oxidative phase of HMP shunt. 4

(r) Explain regulation of TCA cycle. 4

3. (a) Describe biosynthesis of Palmitate from Acetyl CoA. 4

(b) Explain ATP yield from oxidation of Palmitate. 4

(c) Describe biosynthesis of Triacyl glycerol starting from dihydroxyacetone phosphate. 4

OR

(p) Explain role of carnitine in transport of fatty acid. 4

(q) Describe formation of ketone bodies from Acetyl CoA. 4

(r) Explain in brief β-oxidation of unsaturated fatty acids. 4

4. (a) Describe biosynthesis of cerebrosides. 4

(b) Explain regulation of cholesterol biosynthesis. 4

(c) Describe biosynthesis of phosphatidyl inositol. 4

OR

(p) Describe biosynthesis of cholesterol from farnestyl pyrophosphate. 4

(q) Describe formation of Dimethylallyl pyrophosphate from 5-phosphomevalonate. 4

(r) Explain biosynthesis of phosphatidic acid from glycerol. 4

5. Describe transamination, deamination, decarboxylation of amino acids and add a note on regulation of urea cycle. 12

OR

Describe biosynthesis of serine, methionine and tyrosine. 12

6. Describe biosynthesis of AMP and GMP by de novo pathway. 12

OR

Describe de novo biosynthesis of UMP and CTP and add a note on salvage pathway for biosynthesis of AMP and GMP. 12

7. (a) Describe biosynthesis of porphobilinogen from glycine and succinyl CoA. 4

(b) Describe biosynthesis of uroporphyrinogen-III from porphobilinogen. 4

(c) Explain formation of Bilirubin from Heme. 4

OR

(p) Explain transport of bilirubin to liver and conjugation of bilirubin with glucuronate. 4

(q) Describe biosynthesis of Heme from Uroporphyrinogen-III. 4

(r) Describe formation of urobilin and stereobilin from bilirubin diglucuronate. 4