4. Write short note on the following:

   (i) Pyruvate dehydrogenase complex

   (ii) Malate Aspartate shuttle

   (iii) Standard free energy change

   (iv) Secondary metabolites from amino acids

   (v) Phenylketonuria (3x5=15)

5. (a) Explain in detail the urea cycle.

   (b) What is the significance of the Pentose phosphate pathway? Describe the fate of Glucose-6-phosphate when the need for NADPH exceeds that of Ribose-5- phosphate.

   (c) Describe the complete oxidation of palmitic acid and the net energy yield with calculations. (5, 5, 5)

6. (a) Comment on lipoprotein cycle.

   (b) Briefly explain the role of insulin and glucagon on glucose metabolism.

   (c) Explain the structure of ribonucleotide reductase and its regulation in the biosynthesis of deoxyribonucleotides. (4, 5, 6)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 5523 **J**

Unique Paper Code : 6792012401

Name of the Paper : Metabolism and Integration

Name of the Course : **B.Sc. (Hons) Biological Science (NEP)**

Semester : IV

Duration : 2 Hours Maximum Marks : 60

Instructions for Candidates

1. Write your Roll. No. on the top immediately on receipt of this question paper.
2. Attempt **any 4** questions.
3. **Question no.1** is compulsory.
4. **All questions** carry equal marks.

1. (a) State True or False. Justify your answer (any 5)

   (i) More urea is synthesized during starvation

(ii) Glycolysis and gluconeogenesis occur simultaneously.

(iii) A reaction will proceed spontaneously if it is associated with negative ΔG.

(iv) Glucose-6-phosphate dehydrogenase deficiency can lead to haemolytic anaemia.

(v) Purine biosynthesis by salvage pathway requires more energy than de novo pathway

(vi) Threonine is both glucogenic and ketogenic.

(vii) Liver can use ketone bodies both during fasting and well-fed state

(b) Give an example each of a reaction requiring the following coenzyme/cofactor:

(i) PLP

(ii) N^5, N^{10}-methylene THF

(iii) TPP

(iv) NAD^+

(v) FAD^+ (10,5)

2. (a) Briefly explain the irreversible reactions of TCA cycle.

(b) Explain the three major feedback mechanisms involved in regulation of denovo synthesis of purine nucleotides.

(c) Expand the following.

(i) SAH

(ii) PK-A

(iii) MSUD

(iv) PEP (5, 6, 4)

3. (a) Differentiate between the following:

(i) Glucogenic & ketogenic amino acids

(ii) Carbamoyl phosphate synthetase I & II

(iii) Transamination and deamination

(iv) Aerobic and anaerobic glycolysis

(b) What are the various events of metabolism associated with sugars, fats and aminoacids during well fed state? (12, 3)

P.T.O.