

- Instructions:
1. Answers should be legible and to the point.
  2. Use diagrams and flow-charts whenever necessary.
  3. Figures to the extreme indicate full marks.

## SECTION I:

## 1. Write short note (2 out of 3)

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- a. Protein biosynthesis: activation of amino acid and initiation, elongation, and termination.
- b. Tyrosine metabolism: formation of melanin, thyroid hormones, and catecholamines, and enlist disorders with specific defects.
- c. Enzyme inhibition: any two types with suitable example and clinical application.

## 2. Write in brief (4 out of 6)

12

- a. Biochemical functions of vitamin C.
- b. Cofactors and coenzymes with examples.
- c. Gout.
- d. Acute intermittent porphyria.
- e. Liver function tests.
- f. Formation and fate of ammonia.

## 3. Answer in few lines (5 out of 6)

05

- a. Define gene library.
- b. Examples of oxidoreductase group enzymes.
- c. Biochemical findings in hypothyroidism.
- d. What are normal variants of hemoglobin?
- e. Name of enzymes each used for diagnosis and treatment in myocardial infarction.
- f. Write about cytochrome p450; chemistry, biochemical functions and brief on polymorphism.

## SECTION II:

## 4. Read the following case and answers the questions

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A 7 month old boy was admitted to the pediatric ward of SMIMER, Surat in coma.

The infant had been normal at birth, but over the past 2 months his condition had deteriorated as he became lethargic and unable to control the movements of his head. His weight was below average and his head circumference was very small.

His urine contained high levels of methylmalonic acid and serum levels of



vitamin B<sub>12</sub> were 20 pg/ml (normal range: 150-1000 pg/ml). His mother indicated that she was a pure vegetarian and had not consumed any animal products including eggs and milk for the last 8 years. She was on oral antibiotics off and on for the last few months due to recurrent attacks of gastroenteritis. This child was exclusively breast fed. When the breast milk of his mother was analyzed it was found to be containing very low levels of vitamin B<sub>12</sub>.

His condition was improved dramatically after he was administered a 1 mg/day dose of vitamin B<sub>12</sub> for 4 days.

1. Why the mother's milk was so low in vitamin B<sub>12</sub> ?
2. What are the coenzyme forms of Vitamin B<sub>12</sub> ?
3. Name the reactions where coenzyme form of B<sub>12</sub> is required.
4. Why there is increased levels of methylmalonic acid in the urine of this patient ?
5. Is it necessary to employ the combined supplementation of B<sub>12</sub> and folate in the treatment of megaloblastic anemia? why?

5. **Write Justification (5 out of 7)**

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- I. Most human cancers emerge from oncofetal gene.
- II. Use of antitubercular drug Isonicotinic acid hydrazide (INH) produces pyridoxine deficiency.
- III. GABA deficiency may cause Stiffman syndrome.
- IV. Low glycaemic index foods are preferred in diabetic subjects.
- V. Hypoalbuminemia leads to edema.
- VI. Delayed prothrombin time is observed in vitamin-K deficient subjects.
- VII. Vitamin D (active form) is known as hormone.

6. **Answer in one or two lines (5 out of 6)**

05

- I. State two examples of antioxidants.
- II. Define peptide bond.
- III. What is the type of inheritance and defect of Lesch-Nyhan syndrome?
- IV. One carbon donors and acceptors.
- V. Plasma protein involved in emphysema.
- VI. Optimum ratio of cereals to pulses in a balanced diet.