

SMIMER, SURAT.
BIOCHEMISTRY DEPARTMENT
1st M. B. B. S. Preliminary Examination June 2019
Paper-II

Date: -06-2019

Total Marks: 50

Time: 3 Hours

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)** **08**
 - a. Describe the protein biosynthesis in eukaryotes.
 - b. Describe sources, functions and deficiency manifestations of vitamin D.
 - c. Four metabolic roles of glycine to form specialized products.

2. **Write in brief (4 out of 6)** **12**
 - a. Gout: Types, cause and biochemical basis, symptoms
 - b. What is tumor marker? What are the ideal characteristics of tumor markers? Describe commonly used tumor markers (any two).
 - c. Describe 'Folate trap' hypothesis.
 - d. What is detoxification by conjugation? Describe various conjugation reactions of detoxification.
 - e. Describe metabolic disorders of branched chain amino acids.
 - f. Write an account of the clinical and biomedical application of enzymes.

3. **Answer in few lines (5 out of 6)** **05**
 - a. What is Chargaff's rule?
 - b. Why selenium is not required in sufficiency of vitamin E and vice versa?
 - c. Why activity of urea cycle increased in starvation?
 - d. Write one metabolic role of cyanocobalamin and pyridoxine.
 - e. What is metabolic importance of Cyclic AMP?
 - f. Explain how brown adipose tissue keeps body warm?

SECTION II:

4. **Read the following case and answers the questions** **10**

A 3 month old child was brought to the paediatric clinic due to increased lethargy & cyanosis. The child was in good health at birth. Mother tried to breast feed the child in the beginning. Owing to poor milk output the family physician suggested her to feed the child "baby foods" available in the market.

Mother admitted that the baby food was prepared in the well water available near her home which was contaminated by cow dung. Cow dung contains oxidants such as nitrates. On analysis the child's blood contained Methaemoglobin at toxic level (>15% of total Hb as methaemoglobin). Doctor told the mother that the baby is suffering from acquired methemoglobinemia, which is the cause of cyanosis. The baby was treated with a mixture of Vitamin C & methylene blue through IV fluid. Cyanosis disappeared and the child was discharged

 1. What is the structural difference between hemoglobin & methemoglobin?
 2. Why methemoglobin cannot transport oxygen?

3. What is difference between acquired methemoglobinemia and congenital methemoglobinemia?
4. How the administration of methylene blue and vitamin C was beneficial in this patient?
5. How normally methemoglobin is converted to hemoglobin in RBC?

5. Write Justification (5 out of 7) 10

1. Folate inhibitors are prescribed in cancer therapy.
2. Copper is an essential component of several oxidase
3. Histidine in hemoglobin has very important function.
4. Blue fluorescent light is useful in the treatment of neonatal jaundice.
5. Dietary fibres are important in nutrition.
6. RNA is less stable than DNA.
7. Pyridoxine supplementation is helpful in homocystinurea.

6. Answer in one or two lines (5 out of 6) 05

- i. Two examples of biologically important peptide.
- ii. Why iron is said to be “one way” element?
- iii. Two major co-enzyme forms of niacin.
- iv. Serotonin is derived from which amino acid? What are the functions of serotonin (any two)?
- v. Principle of electrophoresis.
- vi. What is the reference range for serum alkaline phosphatases in adults and children?