SURAT MUNICIPAL INSTITUTE OF MEDICAL EDUCATION AND RESEARCH
DEPARTMENT OF BIOCHEMISTRY
I[ST] MBBS BATCH 20 PRELIMINARY EXAMINATIONS, JUNE 2017
PAPER I

Date: 16/07/2017
Time: 2 Hour 30 Minutes **Total Marks: 50**

Instructions: 1. Answer should be legible & to the point.
2. Write each answer from a separate new page.
3. Use diagrams & flow-charts as & when needed.
4. Figures to the extreme right indicate full marks.

SECTION-I

1) Write short notes (2 out of 3) **(4x2= 08)**

a) Define glycogenesis and glycogenolysis. Write the reactions of glycogenesis and glycogenolysis in liver. How these two pathways are reciprocally regulated?

b) Describe in detail the de novo synthesis of fatty acids. Add a note on short- and long term mechanisms that regulate lipogenesis.

c) Describe the stage of absorption, transport and storage of iron in the body. Add a note on disorder associated with defective iron metabolism.

2) Describe in brief (4 out of 6) **(3x4=12)**

a) Anion gap
b) Digestion and absorption of carbohydrates with any one related disorders
c) BMR
d) Regulation of serum calcium levels
e) Plasma lipid profile
f) Inhibitors of Electron transport chain and oxidative phosphorylation.

3) Answer in one or two lines (5 out of 6) **(1x5=05)**

a) What is specific dynamic action (SDA)?
b) What is creatinine clearance? Mention its importance.
c) Energetics of Anaerobic glycolysis
d) What is facilitated diffusion? Give an example
e) Normal values of serum Na^+ K^+ and Cl^- with appropriate unit.
f) Name important intracellular mucopolysaccharide with its biological action

SECTION-II

4) Read the following case and answer questions (5 questions) **(2x5=10)**

A 14-year-old girl was brought to the primary health centre with complaints of weakness, increased thirst, and loss of weight in spite of a ravishing hunger. These symptoms started about 4 weeks earlier and since then she had lost about 7 kg of weight. Her distress was aggravated by nocturnal polyuria, the frequency of micturition was increased and she had to get up 3–4 times at night to void. She thought that her father who died two years ago suffered from 'sugar in urine'. The Medical Officer in the health centre analysed a urine sample and detected presence of reducing sugar (but no ketone bodies). The patient's mother was advised to take her to the teaching hospital immediately. The patient was

admitted by the resident doctor in the hospital emergency and a blood sample was urgently sent for estimation of blood sugar. On examination, the patient was found to be thin with dry skin and sunken eyeballs. There was nothing else of note upon examination. Meanwhile the results were sent by the laboratory: the random venous plasma glucose level was markedly elevated (280 mg/dL). The patient was diagnosed as having insulin-dependent diabetes mellitus (IDDM) and insulin therapy was started with daily administration of the intermediate-acting insulin. Blood glucose levels were monitored and the insulin dose was adjusted accordingly. She was discharged on the fourth day with fasting plasma glucose of 110 mg/dL. Her mother was taught the basic skills of insulin injection, blood glucose monitoring, and urine ketone measurement.

1) Mention WHO criteria for diagnosis of Diabetes mellitus
2) What are the biochemical bases of symptoms observed in this patient?
3) What is C-peptide? What is its importance?
4) Mention any 4 acute metabolic complications of Diabetes Mellitus?
5) Why is it important to use highly purified insulin in treatment of Diabetes mellitus?

5) Write justification (5 out of 7) **(2×5=10)**

a) Fat burns on the wick of carbohydrate
b) Fructose 2,6 bisphosphate is an important metabolic intermediate
c) Carnitine has an important role in oxidation of fat
d) Pre mature babies tend to develop respiratory distress syndrome
e) Blood for serum potassium estimation should not be haemolysed
f) Selenium is an antioxidant mineral
g) Lp(a) is sometimes called as little rascal

6) Answer in one or two lines (5 out of 6) **(1×5=05)**

a) Mention names of any 4 tests to check the purity of fats and oil
b) What is glycemic index?
c) Mention the name and corresponding deficient enzyme of the congenital metabolic disorder related to Lysosome.
d) Mention two important non nucleotide high energy compounds
e) Name two important molecules which carry out non shivering thermogenesis
f) Mention normal levels of blood pH