

**PARUL UNIVERSITY**  
**FACULTY OF MEDICINE**  
**M.B.B.S Oct / Nov - 2020 EXAMINATION**

Year: 1

Subject Code: 19100185

Subject Name: Biochemistry Paper-I

Date: 02-11-2020

Time: 10:00 am to 01:00pm

Total Marks: 100

**Instructions:**

1. Attempt all questions from each section.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.

**SECTION – A**

**Q.1 Structured Essay question (No choice) 2x10 (20)**

**a A 15 year unconscious boy was brought by his parents to PSH hospital. As he was having tachypnea (increase respiratory rate) & fruity smell from breath. Sign of dehydration was present and patient was also having very low blood pressure. His blood investigation reported;**

Parameter	Value	Reference range/Normal range
Random blood sugar	500 mg/dl	<140 mg/dl
Serum acetone	10 mg/dl	<1 mg/dl
pH	7.1	7.35-7.45

The patient was diagnosed as a case of Type – I Diabetes Mellitus with Diabetic ketoacidosis Patient was treated with, normal saline fast I.V. (4-5 litre in 1st 24 hrs) Until systolic blood pressure reaches to normal. Inj Human Insulin injection slow infusion I.V.

All the biochemical parameters and urine output were monitored at regular interval till patient recovered.

1. What is reason of dehydration in this case? (2)
2. Why this patient was having fruity smell in breath & increase respiratory rate? (2)
3. What does blood pH indicate, in this patient? And Give biochemical reason for that abnormality? (2)
4. What is role of insulin in this case? (2)
5. What is role of normal saline in this case? (2)

**b A 58 year old man was appointed as a watchman in a multi national company, had been working for a almost a year, recently lost his job as there had been a robbery in the company at 7:30 pm, 10 days back and he had failed to spot the robber, there had been allegations on him being involved in the robbery. He had being pleading for justice and had approached a lawyer in the same context who advised him for an ophthalmic reference. On examination the doctor found out that he had difficulty in vision in dim light.**

- (i) What is the probable diagnosis? (2)
- (ii) Justify your diagnosis, and also explain the normal biochemical alteration seen in the in dim vision .(4)
- (iii) If he does not receive the suitable treatment, what could be the future complications? & give the deficiency manifestations of the above (4)

**Q.2 Write short notes on : (Any Four out of Five) 4x5 (20)**

1. How Vitamin D increases absorption of calcium?
2. Describe the importance of serum enzymes in the diagnosis of diseases and as therapeutic agents.
3. What are Mucopolysaccharides? Name some and explain their biological significance.
4. Give the functions of Phospholipids and write the importance in fundamental to structure of cell membrane.
5. Explain the mechanism of Metabolic changes during starvation

**SECTION – B**

**Q.3 Explain briefly on: (any Three out of Four) 3x6 (18)**

1. **Patient 58 years old was hospitalized with complaints on pain in the retrosternal area, sudden weakness, sweating, fear, dizziness. The preliminary diagnosis was myocardial infarction.**
  - a) Which three enzyme activity will increase during myocardial infarction? (2)
  - b) Which of them have isozyme form? (2)
  - c) What isoenzyme is the most informative in the first hours of myocardial infarction? (2)

2. **In patients with diabetes glucose revenues in adipocytes reduced. In accordance glucose-dependent inhibition of fatty acid mobilization decreases. Last come into the bloodstream and other tissues used them as an energy source.**
  - a) Deficiency of which hormone causes this condition? (2)
  - b) Explain the mechanism of action of this hormone on intracellular lipolysis.(2)
  - c) How this hormone dependent enzyme of lipolysis goes from inactive to active form?(2)
3. **The deficiency of vitamin B12 in adults is manifested by a specific form of anemia and neurological disorders.**
  - a) Indicate the possible causes of B12 deficiency.(2)
  - b) Explain why the strict vegetarians (vegans) are at risk of developing B12 deficiency.(2)
  - c) Why are the hemopoietic problems associated with a B12 deficiency identical to those observed in a folate deficiency? (2)
4. **Atherosclerosis development (atherogenesis) is a result in a gross disruption of the structure of the arterial wall and the formation of atherosclerotic plaque, which narrows the lumen of the affected artery.**
  - a) Which blood lipoproteins are the most atherogenic? Why? (2)
  - b) Which blood lipoproteins are the most antiatherogenic? Why?(2)
  - c) Which enzyme catalyzes a rate-limiting reaction in cholesterol synthesis? Name its cofactor(2)

**Q.4 Write short notes on: (any Three out of Four) 3x4 (12)**

1. Explain the mechanism of steroid hormone action
2. Components of ETC
3. Sucrose is a Non reducing Sugar
4. Alcohol inhibits gluconeogenesis, so it causes hypoglycemia, if person is on starvation.” explain it.

#### SECTION – C

**Q.5 Write short notes on: (Any Five out of Six) 5x5 (25)**

1. Clinical significant of Dietary Fiber.
2. Significant of Benedict’s Test
3. Why does a Pre-mature baby can suffer from Acute Respiratory Distress Syndrome?
4. Mention the diagnostic criteria for diabetes
5. How Uncouplers like 2-4 dinitrophenol cause thermogenesis
6. Explain an Ideal doctor-Patient relationship components

**Q.6 MCQ s 5x1 (5)**

1. **Cyanide is a poison that causes instant death of the organism. What enzymes found in mitochondria are affected by cyanide?**

(a) Cytochrome oxidase (aa3)	(b) Flavin enzymes
(c) Cytochrome B5	(d) NAD+-dependent dehydrogenase
2. **A 30 year old woman had been ill for a year when she felt pain in the area of joints for the first time, they got swollen and skin above them became reddened. Provisional diagnosis is rheumatoid arthritis. One of the most probable causes of this disease is a structure alteration of a connective tissue protein:**

(a) Mucin	(b) Collagen
(c) Myosin	(d) Ovoalbumin
3. **A woman who has been keeping to a clean-rice diet for a long time was diagnosed with polyneuritis (beriberi). What vitamin deficit results in development of this disease?**

(a) Pyridoxine	(b) Ascorbic acid
(c) Thiamine	(d) Folic acid
4. **A sportsman was recommended to take a medication that contains carnitine in order to improve his results. What process is activated by carnitine the most?**

(a) Synthesis of lipids	(b) Synthesis of steroid hormones
(c) Synthesis of ketone bodies	(d) Fatty acids transport to mitochondrion
5. **Study of conversion of a food colouring agent revealed that neutralization of this xenobiotic takes place only in one phase – microsomal oxidation. Name a component of this phase:**

(a) Cytochrome P-450	(b) Cytochrome B
(c) Cytochrome C	(d) Cytochrome A