

2/1562

1020E328

Candidate's Seat No :

First M.B.B.S. (New Course) Examination**Bio-Chemistry****Paper-I****Date : 23-10-2020, Friday]****[Max. Marks : 100****[Time : 3 Hours**

- Instructions :** (1) Answer to the point.
(2) Figure to the right indicates marks.
(3) Draw diagrams wherever necessary.
(4) Write legibly.
(5) Use separate answer books for each section.

SECTION – I**Q.1 WRITE THE FOLLOWING STRUCTURED LONG QUESTION: (Any 01 out of 02) 1x10 =10**

- ✓ A. Give the structural characteristics of Heme. Name any four proteins or enzymes that have Heme as prosthetic group. Describe catabolism of heme. What is the fate of catabolic end product of Heme & how is it affected in obstructive jaundice? (1+2+3+4)
B. What is glycogen? Where is it present in body? Write its role in maintaining glucose homeostasis in body. Name the key enzymes of its metabolism & explain their regulation by various mechanisms. (1+1+2+6)

Q.2 A. WRITE THE FOLLOWING CASE BASED SCENARIO /APPLIED SHORT NOTES:

(Any 02 out of 03)

2 x 6 = 12

- ✓ a) Read the following case history & answer the questions.
A 20 year old boy developed fever with rigors & chills. The family physician suspected malaria and he was given tablet Primaquin. After two days fever subsided but his condition deteriorated. He had fatigue, dizziness, breathlessness, headache & paraesthesia. His urine colour was reddish black. On examination: Pallor present, icterus present, mild splenomegaly present. Laboratory findings were:
Hemoglobin = 8 gm/dl,
Serum Bilirubin = 6.2 mg/dl, Direct Bilirubin = 0.2 mg/dl, Indirect Bilirubin = 6.0 mg/dl,
RBC G₆PD enzyme = 0.3u/g of Hb (Reference range-4.6 to 13.5 u/g of Hb).
Patient was admitted and treated as per standard protocol. On his discharge doctor gave him a list of drugs which he should avoid in future.
i. G₆PD enzyme is an enzyme of which pathway? Give the reaction catalyzed by it.
ii. What is the importance of enzyme G₆PD in RBCs?
iii. Explain the cause of development of acute hemolytic crisis in this case.
iv. What is glutathione and what is its role in body?
v. Give two other reactions or pathways where NADPH is required (other than reduction of glutathione).
vi. Will Bilirubin be present in urine of the patient? Justify.
b) Write a short note on Thalassemia, its types, molecular defects, clinical presentation & laboratory diagnosis.
c) ✓ Write a short note on laboratory assessment of Glomerular Filtration Rate. $C = \frac{UV}{P}$

Q.2 B WRITE SHORT NOTES: (Any 03 out of 04)**3 x 6 = 18**

- ✓ a) Substrates for gluconeogenesis & how they enter gluconeogenic pathway.
✓ b) Describe the components of Electron Transport Chain (ETC) using a diagram. Illustrate the sites of action of various uncouplers & inhibitors of ETC.
c) Write basic forms of patterns of communication in Doctor-Patient relationship.
✓ d) Role of cytokines in immunology

Q.3 ANSWER IN 2-3 SENTENCES ONLY: (Give biochemical justification) (Any 05 out of 06) $5 \times 2 = 10$

- a) Although no ATPs are generated in Rapoport Leubering cycle, it is beneficial for RBCs.
- b) It is advisable to test an elder person's serum cholinesterase level before giving general anaesthesia to the patient.
- c) Hematin is used in treatment of Acute Intermittent Porphyrria.
- d) Oral administration of glucose along with sodium is helpful in preventing loss of sodium ions in diarrhea fluid.
- e) A wide variety of Immunoglobulins can be synthesized in response to an antigen even though there are limited number of genes for immunoglobulin molecules.
- f) Flipped pattern of Serum LDH is seen in Myocardial Infarction.

SECTION-II

Q.4 WRITE THE FOLLOWING STRUCTURED LONG QUESTION: (Any 01 out of 02) $1 \times 10 = 10$

- A. What are different types of enzyme inhibitors? Write their mechanism of action and effect on enzyme kinetics. Name any four drugs which are enzyme inhibitors and give their mechanism of action. (2+6+2)
- B. What are lipoproteins? Give their types & composition. Discuss the metabolism of HDL & LDL highlighting roles of various enzymes & receptors. Explain their reciprocal role in atherosclerosis. (1+3+4+2) LCAT

Q.5 A WRITE SHORT NOTES: (Any 02 out of 03)

$2 \times 6 = 12$

- a) Role of kidney in maintaining Acid Base balance
- b) Role of Renin-Angiotension system in Water & Electrolyte Balance
- c) Tumour markers & their significance CEA

Q.5 B WRITE SHORT NOTES: (Any 03 out of 04)

$3 \times 6 = 18$

- a) Ketoacidosis
- b) Compare & Contrast -Radioimmunoassay & Enzyme Linked Immunosorbent Assay
- c) Prostaglandins
- d) Describe the mechanism of activation of Proto-oncogenes to oncogenes.

Q.6 ANSWER IN 2-3 SENTENCES ONLY: (Give biochemical justification) (Any 05 out of 06)

$5 \times 2 = 10$

- a) Cytochrome P450 plays a central role in detoxification.
- b) Role of Carnitine in oxidation of Fatty acid.
- c) Anion gap is helpful to diagnose type of metabolic acidosis.
- d) Donnan membrane equilibrium maintains electrolyte balance.
- e) Lecithin is a lipotropic factor.
- f) Hemoglobin acts as a buffer.