



HA-003-001530

Seat No. _____

B. Sc. (Sem. V) (CBCS) Examination

May / June – 2017

Biochemistry : BC-502

(Intermediary Metabolism)

Faculty Code : 003

Subject Code : 001530

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 70

1 Answer the following questions in just one or two lines : **20**

- (1) If a person is claiming that he is fasting since last one week- for political reasons, and did not consume any food. How would you analyze his claim biochemically, whether he is doing genuine fasting or he is lying ?
- (2) Which enzyme is important for conversion of ribonucleotides into deoxyribonucleotides?
- (3) Why fluoride is the best anticoagulant for collection of blood for glucose estimation?
- (4) What is the underlying cause for lactose intolerance?
- (5) What is sweet peptide? Write the important uses of sweet peptide as non sugar sweetener.
- (6) Write the regulatory role of phosphofructokinase in glycolysis.
- (7) Describe the site of action of cyanide in mitochondrial ETC.
- (8) Name the natural uncoupler that uncouples mitochondrial ATP synthesis in brown adipose tissue for thermogenesis.
- (9) Which are the drugs that inhibit HMG CoA reductase enzyme in cholesterol synthesis?
- (10) Why oxidation of fat give more energy compared to carbohydrates?

- (11) Which hormones are synthesized from cholesterol? Give at least two examples.
- (12) Name the non essential amino acids synthesized from following ketoacids: pyruvate, alpha ketoglutarate and oxaloacetate.
- (13) What coenzyme is required for carboxylation reactions? Name the vitamin that is precursor for synthesis of this coenzyme.
- (14) Write two examples of amine neurotransmitters synthesized from amino acids.
- (15) Describe the phenylketonuria (PKU). Genetic defect in which enzyme causes PKU?
- (16) Write the clinical significance of SGPT activity measurement in plasma.
- (17) Name the drug that is used to block production of uric acid in treatment of gout.
- (18) In absence of proton gradient and high levels of ATP in mitochondria, in what direction does the mitochondrial ATP synthase would work?
- (19) What is the role of Carbamoyl phosphate synthetase (CPS II) in cytoplasm?
- (20) Write the effect of Methotrexate (Folic acid analogue) on synthesis of dTMP.

2 (a) Answer any three of the following questions in three to four lines : **6**

- (1) Write the reaction catalyzed by glutamate dehydrogenase and state its importance.
- (2) Why TCA cycle is referred to as a central metabolic pathway? Justify your answer.
- (3) Write the steps involved in synthesis of ketone bodies in liver mitochondria.
- (4) How pyruvate can be converted into oxaloacetate? Write the reaction that carries out this conversion.

- (5) Write the functions of CoQ (Ubiquinone) in mitochondria.
- (6) What is metabolic water? How camels and kangaroo rats survive without water for several days in deserts?
- (b) Answer any three of the following questions briefly : **9**
- (1) Write the reaction catalyzed by isocitrate lyase and write the importance of this enzyme in plants.
 - (2) Write a brief note on uncouplers of mitochondrial electron transport chain.
 - (3) Explain gout. Write the biochemical basis for the treatment of gout.
 - (4) List the functions of biologically important peptides.
 - (5) Briefly describe role of carnitine and carnitine acyl transferase system in mitochondria.
 - (6) Justify: Why fats can't be converted into carbohydrates in animals?
- (c) Answer any two of the following questions : **10**
- (1) Calculate the theoretical ATP yield of complete oxidation of Glucose.
 - (2) Describe mitochondrial ATP synthase as molecular motor and its write its importance.
 - (3) Write a short note on urea cycle.
 - (4) Discuss process of beta oxidation of fatty acids inside the mitochondria.
 - (5) Discuss catabolism of purine nucleotides.
- 3** (a) Answer any three of the following questions : **6**
- (1) What is glutathione? Write its importance.
 - (2) Write a brief note on Lesch-Nyhan syndrome.
 - (3) What do you understand by ketoacidosis? Write the complications caused by ketoacidosis.

- (4) Why HDL is considered as good cholesterol?
- (5) Why ethanol treatment is given to the persons who had suffered methanol poisoning?
- (6) What intermediate of urea cycle act as a precursor for synthesis of nitric oxide neurotransmitter?

(b) Answer any three of the following questions : **9**

- (1) Differentiate between fatty acids oxidation and fatty acid synthesis.
- (2) Show the action of different phospholipases on phospholipids using a diagram.
- (3) Write a brief note on glycogen storage diseases.
- (4) Describe the role of glycogen synthase in process of glycogenesis.
- (5) Write a brief note on Tay -Sachs Disease.
- (6) Define oxidation and reduction processes in reference to mitochondrial electron transport chain with suitable examples.

(c) Answer any two of the following questions : **10**

- (1) Describe HMP pathway.
- (2) Write the differences between de novo and salvage pathway of purine nucleotide synthesis. Discuss salvage pathway for synthesis of purine nucleotides.
- (3) Draw a neat diagram of mammalian mitochondrial electron transport chain showing arrangement of different components of complex I to IV.
- (4) Write the important functions of proteins.
- (5) Describe the process of LDL uptake by receptor mediated endocytosis (with diagram) in extra hepatic tissues.