



MCQ-003-001530 Seat No. _____

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

May / June - 2018

Paper - 502 : Intermediary Metabolism

Faculty Code : 003

Subject Code : 001530

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

[Total Marks : 70

1 Answer the following questions briefly : **20**

- (1) During vigorous exercise, pyruvate produced by glycolysis is converted to _____.
- (2) Gluconeogenesis uses _____ ATPs and _____ GTPs per glucose synthesized.
- (3) Which are the two main products of HMP shunt ?
- (4) Write the function of debranching enzyme.
- (5) A purine with an amine (NH_2) group on the 6th carbon is _____.
- (6) Write the difference between nucleoside and nucleotide.
- (7) Write full form of HGPRT.
- (8) What is the difference between salvage and de novo pathway.
- (9) What is aspartame? Why it is called sweet peptide?
- (10) Which vitamin is involved as a coenzyme in conversion of proline to hydroxyproline in collagen protein?
- (11) Define essential amino acids with examples.
- (12) What do you understand by the word endorphins? What is the role of endorphins in human body?

- (13) Why cholesterol is not classified as an essential lipid?
- (14) What is the effect of malonyl CoA on the activity of Carnitine Acyl Transferase (CAT) I. What is its significance?
- (15) Why the calorific value of cholesterol is zero?
- (16) Write advantages of multi enzyme complex in metabolic pathway, taking suitable example.
- (17) Why NADPH is not involved in ATP synthesis? Write main functions of NADPH.
- (18) Write examples of inhibitors of complex IV of mitochondrial electron transport chain.
- (19) Why the physiological ATP values for oxidation of NADH and FADH₂ are lower than their theoretical ATP values?
- (20) What is the other name of Cytochrome oxidase?

2 (A) Answer any **three** of the following questions : **6**

- (1) How pyruvate is converted to lactate?
- (2) Write any two regulatory reactions of glycolysis.
- (3) Draw the structure of pyrimidine ring and show sources of carbon and nitrogen atoms in it.
- (4) Why protein is not a preferred energy source by human body?
- (5) Write the physiological functions of triglycerides in humans.
- (6) Write the role of Complex II in mitochondrial electron transport chain.

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

- (1) Name the three constituent enzymes of Pyruvate dehydrogenase complex with their coenzyme requirements. Write the reaction catalyzed by pyruvate dehydrogenase complex.
- (2) How GMP is synthesized from IMP?
- (3) Explain conversion of ribose sugar to deoxyribose sugar.

- (4) Define un-couplers of mitochondrial oxidative phosphorylation system and write their examples.
- (5) How alanine, aspartic acid and glutamic acid can be synthesized in our body?
- (6) Describe the mechanism of transport of acetyl CoA from mitochondrial matrix to cytosol for synthesis of fatty acids.

(C) Answer Any **Two** of the following questions : **10**

- (1) Write the importance of TCA cycle and explain all reactions of TCA cycle (structures not required).
- (2) Explain formation of uric acid from purines.
- (3) Write importance of urea cycle in ureotelic organisms; describe the enzymatic steps involved in synthesis of urea by urea cycle. (Structures are not required)
- (4) Discuss the beta oxidation of fatty acids.
- (5) Discuss glycerol phosphate shuttle for transport of NADH from cytosol to mitochondrial matrix.

3 (A) Answer any **three** of the following questions : **6**

- (1) Write the action of hormones on controlling blood glucose levels.
- (2) What you understand by Lech-Nyhan syndrome?
- (3) What is the role of Vitamin B-6 in transamination reactions?
- (4) Justify the statement: Protein synthesis is all or none phenomenon.
- (5) Describe coupling efficiency and P/O ratio.
- (6) Write the metabolic fates of acetyl CoA.

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

- (1) Explain Glyoxylate cycle very briefly.
- (2) Explain salvage pathway of purine synthesis.
- (3) Why TCA cycle is called central metabolic pathway?
Justify your answer.

- (4) Why cyanide is poisonous to humans and why it doesn't cause instant death?
- (5) Define and give examples of glucogenic and ketogenic amino acids.
- (6) Describe the mechanism of activation of fatty acids in cytosol.

(C) Answer Any **two** of the following questions : **10**

- (1) Write the importance of HMP shunt and explain nonoxidative phase of HMP shunt.
- (2) How IMP is synthesized from ribose-5-phosphate ?
- (3) Draw a labelled diagram of human mitochondrial electron transport chain (ETC) showing components of complexes I to IV.
- (4) Describe the reaction catalyzed by acetyl CoA carboxylase and its role. Discuss in detail allosteric regulation, regulation by induction/repression and by phosphorylation/dephosphorylation of this enzyme.
- (5) What is the role of oxidative deamination of amino acids? Write the reaction catalyzed by glutamate dehydrogenase.