



MAK-003-001530-N Seat No. _____

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

October / November – 2016

Biochemistry : BC-502

(Intermediary Metabolism)

Faculty Code : 003

Subject Code : 001530-N

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

[Total Marks : 70

- Instructions :** (1) Figures to the right indicate marks.
(2) All questions are compulsory.
(3) Draw diagram wherever necessary.
(4) Write answers of all questions in main answer sheet.

1 Answer the following in brief : (one mark for each question) **20**

- (1) Give the names for three key regulatory enzymes of glycolytic pathway.
- (2) Describe the role of bile salts in digestion and absorption of lipid.
- (3) Which sugar is present in DNA and RNA?
- (4) Name the essential amino acids, which must be included in the human diet.
- (5) What is carnitine? What is role of carnitine in mitochondrial oxidation of long chain fatty acids?
- (6) What is the product of beta oxidation of odd chain fatty acids? How this product will be further oxidized?
- (7) Give the physiological importance of nucleotide in human body.
- (8) Which tissue cells have capacity to do gluconeogenesis in human body? Why?
- (9) Give the names of any two uncouplers of oxidative phosphorylation.
- (10) Tryptophan is used for the biosynthesis of which vitamin?

- (11) What are the two main sites for glycogen storage? What are the sources for glycogen synthesis?
- (12) Give the names of two amino acids which are not glycolytic.
- (13) What is gout? Give its causes.
- (14) Name the three amino acids that donate amine groups for the purine biosynthesis.
- (15) What is the significance of pentose phosphate pathway?
- (16) A nucleotide is composed of what?
- (17) Differentiate between aerobic and anaerobic respiration.
- (18) Describe the enzymic disorders which cause phenylketonuria.
- (19) Give the name of rate limiting enzyme of fatty acid biosynthesis. Which coenzymes are required for this enzyme?
- (20) What is ketoacidosis?

2 (a) Answer any **three** out of six : 6

- (1) What are the end products of protein catabolism?
- (2) Which cells store triacylglycerol in human body? How they are different from other cells?
- (3) Write a note on origin of purine nucleotide ring atoms.
- (4) Write down overall net reaction of urea cycle.
- (5) Why severe diabetes patients are sometimes being confused as alcoholics?
- (6) Describe the subunits of mitochondrial F_0-F_1 ATPase.

(b) Answer specifically any **three** out of six : 9

- (1) What is albinism? Defect in which enzyme in tyrosine metabolism causes albinism?
- (2) Write the different physiological functions of fat in human body.
- (3) Why it is said that "fat is burnt on the flame of carbohydrate" ?
- (4) Define gluconeogenesis. Name key enzymes of gluconeogenesis.
- (5) What is proton-motive force? Discuss in brief.
- (6) Write the role of brown adipose tissue. How it is involved in preventing obesity?

(c) Write notes on : (any two out of five) 10

- (1) Write the reactions of fatty acid synthesis from acetyl CoA.
- (2) Write detailed note on glycogen synthesis.
- (3) Discuss the fate of pyruvate under different metabolic conditions.
- (4) Explain the degradative pathway for purine nucleotide.
- (5) Discuss glycerol phosphate shuttle.

3 (a) Answer any **three** out of six : 6

- (1) Which coenzymes are required by glutamate dehydrogenase in oxidative deamination of amino acids?
- (2) What are the important differences between Hexokinase and Glucokinase?
- (3) Explain in short – Regulation of glycolysis.
- (4) Short note on different pathways for nucleotide synthesis.
- (5) How fatty acids are activated in cytosol to form Acyl CoA?
- (6) Write the role of amino acid decarboxylases.

(b) Answer specifically any **three** out of six : 9

- (1) Which two reactions of urea cycle occur in mitochondrial matrix?
- (2) Describe the importance of multi-enzyme complexes in metabolism with suitable example.
- (3) What is anaplerotic reaction? Discuss with suitable example.
- (4) Describe oxidation and reduction reactions with respect to mitochondrial ETC.
- (5) How saturated fatty acids are converted into unsaturated fatty acids?
- (6) Discuss the mechanism of Glucose uptake in peripheral tissues.

(c) Write notes on : (any **two** out of five) **10**

- (1) Describe the transamination reactions of amino acids with suitable examples.
 - (2) How pyrimidine nucleotide biosynthesis is regulated?
 - (3) Draw a labelled diagram of Mitochondrial ETC showing the arrangements of components of Complexes I to IV.
 - (4) Explain biosynthesis of TAG.
 - (5) What would be the total energy yield when glucose is completely oxidized to CO₂ and water?
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