MAK-003-001530 Seat No. _____

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

October / November – 2016

Biochemistry : BC-502

(Intermediary Metabolism)

Faculty Code : 003

Subject Code : 001530

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 glycogenic.

(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 CO_2 and water?
