PAQ-003-1015030

PAQ-003-1015030 Seat No. _____

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

October / November - 2018

502 - Intermediary Metabolism

Faculty Code : 003
Subject Code : 1015030

Time : $2\frac{1}{2}$ Hours] [Total Marks : **70**

1 (a) Answer the following questions in one or two lines : **4**

(1) Fluoride is the best anticoagulant for collection of blood for glucose estimation. Which glycolytic enzyme is inhibited by fluoride?

(2) Why muscle glycogen cannot be useful in maintenance of blood glucose levels?

(3) Which are the two different roles played by debranching enzyme in glycogenolysis?

(4) Deficiency of which enzyme in intestinal brush boarder system causes lactose intolerance?

(b) Answer any one of the following questions briefly : **2**

(1) Why HMP pathway is also known as HMP shunt?

(2) Explain why muscle glycogen is, not useful in maintaining blood glucose levels during hypoglycemic conditions?

(c) Answer any one of the following questions in detail : **3**

(1) What do you understand by substrate level phosphorylation? Write at least one example each for substrate level phosphorylation reactions in glycolysis and TCA cycle.

(2) Explain why gluconeogenesis is not just reverse of glycolysis? Write the reactions of gluconeogenesis that are different from glycolysis.

(d) Write a detailed note on any one of the following questions briefly : **5**

(1) Describe the steps of glycolysis for conversion of glucose into lactate.

(2) Write a short note on reactions of TCA cycle.

2 (a) Answer the following questions in one or two lines : **4**

(1) Define oxidative phosphorylation.

(2) What is the role of iron sulfur proteins in mitochondrial electron transport system?

(3) Name the inhibitors that can inhibit complex IV of ETC (cytochrome oxidase)

(4) Which complex of mitochondrial ETC is involved in oxidation of $FADH_2$ produced in mitochondria?

(b) Answer any one of the following questions briefly : **2**

(1) What is the effect of DNP on mitochondrial electron transport and oxidative phosphorylation system?

(2) Describe ADP/O ratio.

(c) Answer any one of the following questions in detail : **3**

(1) Explain why oxidation of $FADH_2$ produces one less ATP in comparison to oxidation of NADH in mitochondria.

(2) Write a brief note on inhibitors of mitochondrial ETC.

(d) Write a detailed note on any one of the following questions briefly : **5**

(1) Write a short note on different components mitochondrial ETC and their arrangement using a suitable diagram.

(2) Discuss structure and function of mitochondrial ATP synthase.

3 (a) Answer the following questions in one or two lines : **4**

(1) What coenzyme is essential for amino group transfer reactions by transaminases?

(2) Write two examples of amino acids that can be converted into glucose by gluconeogenesis.

(3) Genetic defect in which enzyme leads to albinism?

(4) Why aspartame is not advised to people suffering from phenylketoneuria (PKU)?

(b) Answer any one of the following questions briefly : **2**

(1) Why ammonia is toxic and needs to be converted into urea before excretion via urine?

(2) Which intermediate of urea cycle is acting as a precursor for synthesis of nitric oxide?

(c) Answer any one of the following questions in detail : **3**

(1) What do you understand by essential amino acids? Why they cannot be synthesized in our body? Write the examples of essential amino acids.

(2) Explain why proteins are not preferred as energy source in human body

(d) Write a detailed note on any one of the following questions briefly : **5**

(1) Describe the reactions of urea cycle using neat diagram (Structures of intermediates are not required)

(2) Write a short note on enzymatic synthesis of various biological amines and their importance.

4 (a) Answer the following questions in one or two lines : **4**

(1) List the functions of cholesterol in humans.

(2) Which enzyme of cholesterol synthesis is inhibited by statin group of drugs?

(3) Name the drug that inhibit bacterial fatty acid synthesis and is commonly used as an antibacterial agent in face wash, soap, tooth paste etc.

(4) List the two sources of glycerol 3 phosphate for the synthesis of triacylglycerol.

(b) Answer any one of the following questions briefly : **2**

(1) Write a brief note on mechanism of control of activity of hormone sensitive lipase

(2) Draw a structure of phospholipid molecule and show the sites of action of different phospholipases.

(c) Answer any one of the following questions in detail : **3**

(1) Write examples of ketone bodies and under which conditions acetyl CoA would go for ketone body synthesis?

(2) Write differences between the processes of fatty acid oxidation and fatty acid synthesis.

(d) Write a detailed note on any one of the following questions briefly : **5**

(1) Describe the steps involved in fatty acid synthesis.

(2) Calculate the net ATP yield of complete oxidation of Palmitic acid by mitochondrial beta oxidation pathway.

5 (a) Answer the following questions in one or two lines : **4**

(1) Write any two name of Antimetabolites of purine nucleotides.

(2) What do you understand by Gout ?

(3) Write the function of CPS-II.

(4) UTP is converted to CTP by the enzyme.

(b) Answer any one of the following questions briefly : **2**

(1) What do you understand by Lesch-Nyhan syndrome?

(2) Write all Element source of pyrimidine base with ring structure.

(c) Answer any one of the following questions in detail : **3**

(1) Discuss salvage pathway of purine biosynthesis.

(2) Explain regulation of pyrimidine biosynthesis.

(d) Write a detailed note on any one of the following questions briefly : **5**

(1) Write a detail note on AMP and GMP synthesis from IMP.

(2) Discuss catabolism of pyrimidine.
