3 (Sem–4/CBCS) ZOO HC 3

2022

ZOOLOGY

(Honours)

Paper : ZOO–HC–4036

(Biochemistry of Metabolic Processes)

Full Marks : 60

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Fill in the blanks : ***(any seven)*** 1×7=7

   (a) The net result of the glycolytic breakdown of a molecule of glucose is _____ moles of ATP.

   (b) The formation of glucose from non-carbohydrate sources is known as _____.

   (c) The final common pathway for the oxidation of carbohydrates, fat and protein is _____.

(d) _____ proposed that fatty acids are degraded by the sequential removal of two carbon units from the COOH end of the molecule.

(e) Urea is produced in animals by a cyclic process known as the _____.

(f) Per molecule of glucose under anaerobic conditions yields _____ moles of ATP.

(g) The process of conversion of glucose into pyruvate is known as _____.

(h) _____ is a chemical reaction that transfers an amino group to a ketoacid to form new amino acids.

(i) _____ links the urea cycle and the citric acid cycle.

(j) The compound in urine responsible for the color reactions was identified as _____.

2. Answer the following briefly : ***(any four)*** 2×4=8

(a) What is the fundamental distinction between NADPH and NADH ?

(b) Differentiate between saturated and unsaturated fatty acids with examples.

(c) Write the structure of adenosine triphosphate (ATP) molecule.

(d) What do you understand by "redox" reactions ?

(e) State the significance of citric acid cycle.

(f) What are the causes and consequences of ketosis ?

(g) State the physiological role of glycogen.

(h) Write a note on Sir Hans Krebs.

3. Answer ***any three*** questions from the following : 5×3=15

(a) Describe Cori's cycle along with its significance. 3+2=5

(b) ATP is called the "energy currency of the cell". Explain.

(c) Explain the role of triacylglycerols as a major storage of metabolic energy.

(d) What is deamination ? Describe the glucogenic and ketogenic aminoacids and their deamination. 2+3=5

(e) Discuss essential and non-essential type of aminoacids with examples.

(f) Discuss the process of gluconeogenesis and glycogenesis. 2½+2½=5

(g) Discuss the role of liver in the aminoacids metabolism.

(h) What is phenylketonuria ? How it affects in the body metabolism ? 2+3=5

4. Answer the following : ***(any three)*** 10×3=30

(a) Explain and illustrate the different steps involved in the glycolytic pathway.

(b) Give an account of β-oxidation of saturated carbon fatty acids (Palmitic acid) along with its energetics.

(c) Describe the detoxification of ammonia by urea cycle.

(d) Define Electron-transport system (ETS) or respiratory chain system. Discuss the various steps involved in the system. 2+8=10

(e) Describe the general sequence of events in the citric acid cycle. Add a note on its "Amphibolic" role. 8+2=10

(f) What do you mean by metabolism ? Describe in detail about the anabolism and catabolism with suitable examples. 2+4+4=10

(g) Describe briefly on compartmentalization of metabolic pathways.

(h) Explain the metabolism, biochemical importance and inborn errors of : 5+5=10

(i) Glycine and

(ii) Phenylalanine, tyrosine
