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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)** $1 \times 7 = 7$

(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 _____.

Contd.

- (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*) $10 \times 3 = 30$

(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