U.G. 3rd Semester Examination - 2019

ZOOLOGY

[HONOURS]

Course Code : ZOOL(H)CC-07-T

Full Marks : 40 Time : $2\frac{1}{2}$ Hours

The figures in the right-hand margin indicate marks.

Candidates are required to give their answers in their own words as far as practicable.

1. Answer any **five** of the following: 2×5=10

   a) Name one rate-limiting enzyme of glycolysis and state its function. 1+1

   b) Define Km. What is the unit of Km?

   c) What is anti-parallel β-pleated sheet?

   d) How does enzyme help in accelerating a reaction?

   e) Why is ammonia accumulation fatal in humans?

   f) Why is B-DNA the most frequent form of DNA in living cells?

   g) State the importance of Pentose phosphate pathway.

[Turn over]

h) Give examples of two major unsaturated fatty acids prepared by anaerobic desaturation.

2. Answer any **two** of the following: 5×2=10

a) What is plotted on 'X' and 'Y' axes on a lineweaver-Burk plot? Show how to derive equation for the plot from the following equation $V_0 = \frac{V_{max}[S]}{K_M + [S]}$ explain how Vmax and Km can be found from the graph's intercepts. 1+4=5

b) What are the favourable forces for protein bonding? Comment on the role of chaperons in protein folding. 1+4=5

c) Schematically represent the reactions of Krebs' Cycle where NAD^+ is reduced to NADH. H^+ ? Explain why Krebs' Cycle is also called Tricarboxylic Acid (TCA) Cycle? 3+2=5

d) Discuss about the control of *de novo* pyrimidine nucleotide synthesis in humans. State the function of a phospodiester bond in DNA structure. 4+1

3. Answer any two of the following: $10 \times 2 = 20$

a) i) In an experiment it was observed that DNA from cells after two replications consisted equal amounts of DNA with two different densities (^{14}NDNA and ^{15}NDNA). State the experimental procedure and the inference of the experiment.

ii) State the rate limiting step of β oxidation. Why triglycerides produce more energy than carbohydrate? $5+(3+2)=10$

b) i) How many cycles of β oxidation are required to completely process a C_{18} fatty acid? State the set of reactions of a cycle.

ii) Name one inhibitor of Electron Transport chain. Explain how electron transport chain (ETC) produces transmembrane proton electrochemical gradient with the help of redox raction. $(1+4)+(1+4)=10$

c) i) Name one amino acid that does not follow 'Ramachandran Plot'. Why do you think proline can act as a structural disruptor in α-helix and β-sheets?

ii) Explain the following:

Zero order enzyme-substrate reaction, First order enzyme-substrate reaction and Second order enzyme-substrate reaction. (1+3)+6

d) i) Schematically represent the steps of urea cycle in mitochondria. How α-keto acids determine the fate of transamination products?

ii) How deamination is involved in base alteration of DNA? (3+3)+4
