2016

ZOOLOGY

PAPER : ZOO 203
BIOCHEMISTRY AND METABOLISM

Full Mark : 80

Time : 3 Hrs

Figures in the right hand margin indicate full marks for the question

1. Multiple choice questions (any eight) $1 \times 8 = 8$

    I. Which of the following statements about glycogen storage is incorrect?

    a) glycogen is stored in muscle and liver

    b) glycogen is a major source of stored energy in the brain

    c) glycogen storage occurs in the form of dense granules in the cytoplasm of cells

    d) glycogen stored in skeletal muscle

    II. Which one of the following enzyme is required in glycogenesis from Glucose-1-P to UDP- glucose?

    a) Uridinediphosphate

    b) Phosphoglucomutase

    c) Uridine triphosphate

    d) Glycogen primer

(1)   *P.T.O.*

III. _____ metabolic processes occurs in the mitochondria

a) Cholesterol synthesis

b) Fatty acid â-oxidation

c) Glycolysis

d) Pentose phosphate pathway

IV. What is the key regulatory enzyme for fatty acid synthesis?

a) Acetyl co A carboxylase

b) Acetyl co A synthetase

c) Thioesterase

d) Keto acyl synthase

V. Which statement is not true about enzyme inhibition?

a) In competitive inhibition, the inhibitors bind to the active site of the enzyme

b) In non-competitive inhibition, the inhibitors bind to the allosteric site of the substrate

c) In irreversible inhibition, a poison binds to the enzyme so that it can never work again

d) None of the above

VI. In uncompetitive inhibition, which of the following is true

a) Vmax remains constant but Km increases

b) Both Vmax decrease Km decreases

c) Vmax decrease but Km remains same

d) All the above

VII. Strong acids or bases denature the proteins because it can change the bonding by

a) Altering hydrogen bonding and salt bridge patterns of side chains of amino acids

b) Reduces the disulfide bonds to sulfhydryl groups and breaks intra or interchain sulfide bonds

c) Both are true

d) Both are false

VIII. Which of these is anon-polar covalent bond?

a) Bond between sodium and chloride

b) Bond between two water molecules

c) Bond between two carbons

d) Bond between nitrogen and hydrogen

IX. Which of the following is/are true about glycosylation?

a) N-linked glycans attached to a nitrogen of asparagineside-chains

b) N-linked glycosylation requires participation of a special lipid called dolichol phosphate

c) (O-linked glycans attached to the hydroxyloxygen of serine

d) All the above

2. Answer the following short questions (any five) $2 \times 5 = 10$

a) Write short notes on Leucine Zippers.

b) What is the difference between primary metabolites and secondary metabolites?

c) What is competitive inhibition and non-competitive inhibition?

d) What are the natures of covalent and ionic bond? Why are polar and ions are soluble in water?

e) How does NMR differ from X-Ray crystallography?

f) Write about chemical properties of an active site of enzyme?

3. Answer the following questions (any four) $5 \times 4 = 20$

a) Difference between nucleotides and nucleoside.

b) Write about the development of brown and beige adipocytes.

c) Structure of myoglobin

d) Allosteric enzyme and enzyme as a drug target

e) Concept of Free energy

4. Answer the following long type questions (any two)
$9 \times 2 = 18$

a) What is homeostasis? Write about the negative feedback and positive feedback in homeostatic regulation.   2+7

b) What is glycosylations? Discuss the different types of glycosylations and their role in metabolism.   2+7

c) Describe and give an account for the different levels of protein structure.   9

5. Answer the following very long type questions (any two) $12 \times 2 = 24$

a) What is extracellular signaling? Write on regulation of metabolism by extracellular signals.   2 + 10

b) What is activation energy of an enzyme? Derive the equation for michaelis-Menten constant for the measurement of rate of an enzyme activity.   3+9

c) What is kreb's cycle and mention the total number of ATP produced? Discuss the role of different enzymes involved in the process.   4+8=12

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