BIOCHEMISTRY
(BIOT 2103)

Time Allotted : 3 hrs **Full Marks : 70**

Figures out of the right margin indicate full marks.

Candidates are required to answer Group A and any 5 (five) from Group B to E, taking at least one from each group.

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

Group – A
(Multiple Choice Type Questions)

1. Choose the correct alternative for the following: **10 × 1 = 10**

(i) The cofactors of pyruvate dehydrogenase complex are
(a) Folate and TPP (b) FAD and NAD^+
(c) NADH and Nicotinic acid (d) all of these

(ii) The coenzyme involved in transfer of acetyl group
(a) NADH (b) Coenzyme A
(c) S-adenosyl methionine (d) Biotin

(iii) Allosteric enzymes are
(a) Larger than simple enzyme
(b) Smaller than simple enzyme
(c) Larger and more complex than simple enzyme
(d) Smaller and less complex than simple enzyme

(iv) Pyruvate is the keto acid of
(a) Alanine (b) Aspartate
(c) Glutamate (d) Proline

(v) One essential amino acid in human is
(a) Leucine (b) Isoleucine
(c) Valine (d) Alanine

(vi) Which one is an example of a ketone body?
(a) acetoacetate (b) acetone
(c) pyruvate (d) Both (a) and (b)

(vii) Cholesterol Synthesis is regulated by which enzyme?
(a) HMG-CoA Reductase (b) HMG-CoA Synthase
(c) HMG-CoA Oxidase (d) HMG-CoA Lyase

(viii) Rubisco binds to
(a) CO_2 (b) O_2
(c) both CO_2 and O_2 (d) none

(ix) An example of fat soluble vitamin
(a) Vitamin D (b) Vitamin C
(c) Vitamin A (d) Both Vitamins D and A

(x) TCA cycle in prokaryotes takes place at
(a) Mitochodria (b) Nucleus
(c) Cytoplasm (d) Glyoxysomes

Group – B

2 (a) Describe the pay-off phase of glycolysis. Why it is called so?

(b) How polysaccharides enter glycolytic pathway? What is the main regulatory enzyme here and how it is regulated?

(c) Discuss the role of glycogenin protein in glycogen biosynthesis.

(2 + 2) + 4 + 4 = 12

3. (a) What is ETC? Describe with a schematic diagram the sequence of electron flow.

(b) How generation of ATP by ETC can be coupled?

(c) Explain the molecular mechanism of the following:
(i) CN^-
(ii) 2,4-DNP

(1 + 4) + 3 + (2 + 2) = 12

Group – C

4 (a) Describe both local and global regulation of Fatty Acids.

(b) What is the biological significance of ω- oxidation? Describe the steps for ω-oxidation. (Drawing of chemical structures is a must along with its enzymes and conditions).

6 + (3 + 3) =12

5. (a) How plasmalogen is synthesized? Mention the inter conversion reactions of Phospholipids.

(b) What are ketone bodies? How ketone bodies are formed? Why is ketosis deadly?

(4 + 2) + (2 + 2 + 2) = 12

Group – D

6. (a) Describe with a suitable example the importance of trans amination reaction in amino acid metabolism. Discuss the role of vitamin B_6 in this reaction.

(b) Discuss the catabolism of any one glucogenic amino acid.

(c) Discuss any one amino acid catabolic disorder.

(4 + 2) + 4 + 2 = 12

7. (a) Mention catabolic pathway of phenylalanine. What defect in this pathway results in phenylketonuria?

(b) Describe the salvage pathway of purine biosynthesis.

(4 + 2) + 6 = 12

Group – E

8. (a) Describe the four major types of Signaling Process with suitable examples and diagrams (optional for diagrams)

(b) Distinguish between working principle of G-proteins to that of RTKs using suitable examples.

6 + 6 = 12

9. (a) Discuss in detail about Calmodulin structure and its function.

(b) How β-adrenergic pathway can be desensitized?

6+6 = 12

Department & Section	Submission Link
BT	https://classroom.google.com/c/MTIyNDA0ODI4OTgz/a/Mjc1ODk4OTE5NDc4/details