

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION DECEMBER 2022
(First Semester)

Branch – BIOTECHNOLOGY

METABOLIC REGULATION

Time: Three Hours

Maximum: 50 Marks

SECTION-A (5 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (5 x 1 = 5)

1. Which hormone regulates the glucose metabolism?
(i) Epinephrine (ii) Alkaline phosphatase
(iii) Ferritin (iv) Somatostatin
2. Which enzyme plays an important role in glycogenolysis?
(i) Glycogen phosphorylase (ii) Hexokinase
(iii) DNA Polymerase (iv) Phosphofructokinase
3. _____ is formed by carboxylation of acetyl CoA by acetyl CoA carboxylase.
(i) Adenine (ii) Palmitic acid
(iii) Amino acids (iv) Lactose
4. Transamination refers to the transfer of an amino group from one molecule to another, especially from an amino acid to a _____.
(i) nitric acid (ii) sulphuric acid
(iii) keto acid (iv) hydrochloric acid
5. During starvation, which biomolecules are utilized after the fat stores are gone?
(i) sugars (ii) lipids
(iii) nucleic acids (iv) proteins

SECTION - B (15 Marks)

Answer ALL Questions

ALL questions carry EQUAL marks (5 x 3 = 15)

6. a) Discuss the biochemical mechanisms involved in feedback inhibition.
OR
b) Explain the regulation of sugars by glucagon hormone.
7. a) Assume if there is no gluconeogenesis, what will happen?
OR
b) Show how phosphofructokinase act as the rate limiting enzyme in glycolysis?
8. a) Determine what happens during ketogenesis?
OR
b) Explain the role of acetyl CoA carboxylase in fatty acids degradation.
9. a) Discuss the oxidative deamination of methionine.
OR
b) Shows the biochemical steps of Urea cycle. Why it is important?
10. a) Discuss how pyruvate act as the key junctions in metabolism?
OR
b) "Insulin hormone is essential to control Diabetes Mellitus" – Justify the statement.

Cont...

SECTION -C (30 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 6 = 30)

11. a) Compare and contrast Cyclic AMP-dependent & Cyclic GMP dependent protein kinases.

OR

b) Elucidate the bioenergetics of metabolic cycle.

12. a) Categorize the products of TCA cycle. Where does it occur? List the biochemical steps involved in it.

OR

b) Enumerate the biochemical steps of glycogen synthesis.

13. a) Determine the steps involved in Beta oxidation of fatty acids.

OR

b) Assess how important is the biosynthesis of cholesterol?

14. a) Elucidate the biosynthetic pathway of purines.

OR

b) Describe the degradation pathway of pyrimidines.

15. a) "Metabolic specialization of organs are essential for the survival of living organisms" – Justify the statement.

OR

b) Determine the metabolic profiles of kidney.

Z-Z-Z

END