

**PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)**

**BSc DEGREE EXAMINATION DECEMBER 2024
(Third Semester)**

Branch - BIOTECHNOLOGY

METABOLISM

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)

Answer ALL questions

ALL questions carry EQUAL marks

(10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Which of the following is the end product of glycolysis? a) Glucose b) Pyruvate c) Lactate d) Glycogen	K1	CO1
	2	Which of the following is the rate-limiting enzyme in gluconeogenesis? a) Pyruvate carboxylase b) Glucose-6-phosphatase c) Phosphoenolpyruvate carboxykinase (PEPCK) d) Fructose-1,6-bisphosphatase	K2	CO1
2	3	Which of the following is a type of omega-3 fatty acid? a) Palmitic acid b) Alpha-linolenic acid (ALA) c) Oleic acid d) Stearic acid	K1	CO2
	4	The hydrophilic (water-attracting) part of a phospholipid molecule is a) The fatty acid tails b) The phosphate head c) The glycerol backbone d) The entire molecule	K2	CO2
3	5	The final product of purine catabolism in humans is: a) Urea b) Allantoin c) Ammonia d) Uric acid	K1	CO3
	6	In pyrimidine catabolism, what happens to the nitrogen-containing portion of the molecule? a) It is converted into uric acid and excreted. b) It is stored in the liver for future use. c) It is incorporated into the urea cycle. d) It is released as nitrogen gas.	K2	CO3
4	7	What is the effect of glucagon on glucose metabolism during hypoglycemia? a) It stimulates glycogenesis and inhibits gluconeogenesis. b) It promotes glycogenolysis and gluconeogenesis. c) It increases lipogenesis and decreases ketogenesis. d) It inhibits protein synthesis and enhances protein breakdown.	K1	CO3
	8	Which hormone is primarily responsible for increasing metabolic rate and heat production during cold exposure? a) Insulin b) Thyroxine (T4) c) Cortisol d) Epinephrine	K2	CO3
5	9	What is the primary purpose of sun protection for individuals with albinism? a) To enhance vitamin D production b) To prevent damage and reduce the risk of skin cancer c) To improve hair texture d) To correct visual acuity	K1	CO4
	10	Which of the following is NOT a substrate for gluconeogenesis? a) Lactate b) Pyruvate c) Acetyl-CoA d) Glycerol	K2	CO4

Cont...

SECTION - B (35 Marks)

Answer ALL questions

ALL questions carry EQUAL Marks

(5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	With the neat diagram. Explain the significance of TCA Cycle.	K3	CO1
	(OR)			
	11.b.	Illustrate the process of gluconeogenesis.		
2	12.a.	Explain the concept of biosynthesis of saturated fatty acids.	K4	CO2
	(OR)			
	12.b.	Elucidate the process of phospholipid synthesis of phosphatidyl choline.		
3	13.a.	Demonstrate the clinical symptoms and treatment for Lesh Nyhan syndrome.	K4	CO3
	(OR)			
	13.b.	Explain the catabolism of pyrimidines.		
4	14.a.	Give an outline on biosynthesis of tyrosine.	K4	CO3
	(OR)			
	14.b.	Explain urea cycle with neat sketch.		
5	15.a.	Demonstrate the phenomenon of albinism.	K3	CO4
	(OR)			
	15.b.	Outline the benefits of regular exercise in our day-to-day life.		

SECTION -C (30 Marks)

Answer ANY THREE questions

ALL questions carry EQUAL Marks

(3 × 10 = 30)

Module No.	Question No.	Question	K Level	CO
1	16	Extend the concept of Carbohydrate metabolism in detail.	K4	CO1
2	17	Demonstrate the metabolism of cholesterol with diagram.	K4	CO2
3	18	Explain in detail de novo pathway of purine biosynthesis.	K3	CO3
4	19	Analyse the Relation between starvation and induction of metabolic changes.	K4	CO3
5	20	Illustrate various diseases due to metabolic errors in detail.	K3	CO4

Z-Z-Z

END