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22BTU311N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2025
(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 molecules enters the TCA cycle by combining with oxaloacetate? a) Pyruvate b) Acetyl-CoA c) Glucose d) Lactate	K1	CO1
	2	Which hormone is released in response to low blood glucose levels to promote glycogen breakdown in the liver? a) Glucagon b) Insulin c) Growth hormone d) Thyroxine	K2	CO1
2	3	What type of bond is found in unsaturated fatty acids? a) Single bonds only b) At least one double bond c) Triple bonds d) No bonds	K1	CO2
	4	Phospholipids are amphipathic molecules because: a) They contain both hydrophobic and hydrophilic regions b) They are entirely hydrophobic c) They only contain hydrophilic regions d) They have no interaction with water	K2	CO2
3	5	Which purine base is converted into uric acid during catabolism? a) Cytosine b) Thymine c) Adenine d) Guanine	K1	CO3
	6	What is the primary difference between the catabolism of purines and pyrimidines? a) Purines are converted to uric acid, while pyrimidines are converted to urea. b) Purines are excreted as uric acid, while pyrimidines are broken down into water-soluble products. c) Purines produce ammonia during catabolism, while pyrimidines do not. d) Purines are recycled, while pyrimidines are never recycled	K2	CO3
4	7	Which of the following processes is enhanced during the stress response to provide energy? a) Protein synthesis b) Lipogenesis c) Glycogenolysis d) Glycogenesis	K1	CO3
	8	How does insulin regulate the metabolism of glucose? a) By inhibiting glycogenolysis and stimulating glycogenesis b) By promoting lipolysis and decreasing fatty acid synthesis c) By increasing gluconeogenesis and reducing glycolysis d) By enhancing protein breakdown and reducing protein synthesis	K2	CO3
5	9	Which test is commonly used to diagnose diabetes and monitor long-term glucose control? a) Random blood glucose test b) Fasting blood glucose test c) Hemoglobin A1c (HbA1c) test d) None of the above	K1	CO4

Cont...

5	10	How does albinism affect vision in affected individuals? a) It improves visual acuity b) It leads to increased night vision c) It results in color blindness d) It causes light sensitivity and reduced visual acuity	K2	CO4

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.	Outline the process of homeostasis of blood glucose.	K2	CO1
		(OR)		
	11.b.	With neat sketch explain the process of glycolysis.		
2	12.a.	Explain beta oxidation of fatty acids with flow chart.	K3	CO2
		(OR)		
	12.b.	Summarize the concept of biosynthesis of unsaturated fatty acids.		
3	13.a.	Explain the catabolism of purines.	K3	CO3
		(OR)		
	13.b.	Explain gout syndrome in detail.		
4	14.a.	Outline the biosynthesis of tryptophan.	K3	CO3
		(OR)		
	14.b.	Elucidate the phenomenon of transamination and list the enzymes involved during the process of the same.		
5	15.a.	Interpret the concept of BMR.	K4	CO4
		(OR)		
	15.b.	Comment on key factors affecting caloric homeostasis.		

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	With neat flow diagram explain Kerb's cycle.	K4	CO1
2	17	Compare and contrast alpha and omega oxidation.	K4	CO2
3	18	In detail explain salvage pathway of purine biosynthesis.	K4	CO3
4	19	Explain deamination process in detail.	K4	CO3
5	20	Outset the causes, symptoms and treatment in context with the phenomenon of obesity.	K5	CO4

Z-Z-Z END