St. Philomena's College (Autonomous), Mysore

PG Department of Biochemistry

Question Bank (Revised Curriculum 2018 onwards)

Second Year- Third Semester (2019 - 21 Batch)

Course Title (Paper Title): Nitrogen Metabolism. QP Code: 54201

Unit	Sl. No	Questions	Marks
1	1.	Give the significance of nitrogen in biological systems	2
1	2.	What is decay?	2
1	3.	What is nitrification?	2
1	4.	What is denitrification?	2
1	5.	What is industrial nitrogen fixation?	2
1	6.	What is atmopheric nitrogen fixation?	2
1	7.	What is biological nitrogen fixation?	2
1	8.	What is anamox?	2
1	9.	How are ammonia and nitrates assimilated?	2
1	10.	Distinguish between symbiotic and non symbiotic nitrogen fixation.	2
1	11.	What is the role of nitrogenase complex?	2
1	12.	How is nitrogenase complex regulated?	2
1	13.	What is atmospheric nitrogen fixation?	2
1	14.	What is nod factor? Give its significance	2
1	15.	What are bacteroids? How are they formed?	2
1	16.	What is leghemoglobin? Give its importance	2
2	17.	What are the Cellular functions of protein degradation?	2
2	18.	What is the significance of protein degradation?	2
2	19.	Explain proteolysis	2
2	20.	What are the chemical changes which lead to protein degradation?	2
2	21.	What is chemical aging?	2
2	22.	How does ROS lead to protein degradation?	2
2	23.	Write a short note on protein turn over	2
2	24.	Which are the Proteases Involved in Protein Turnover?	2
2	25.	Which are the Enzymes involved in the process of Ubiquitination?	2
2	26.	Write the Structure of proteosome	2
2	27.	Write a short note on lysosomal protein degradation	2
2	28.	What are Glycoproteins? Give their biological significance	2
2	29.	How are O linked glycoproteins biosynthesized?	2
2	30.	What are the functions of GPI linkages? Give its structure	2
2	31.	How is dolichol phosphate formed?	2

2	32.	What are proteoglycans? Give their biological significance	2
2	33.	Comment on the Modules of nonribosomal peptide synthetases	2
2	34.	Give the structure and functions of Heme	2
2	35.	Comment on the rate limiting step in hepatic heme synthesis	2
2	36.	What are the reasons behind hyperbilirubinemia? Add a note on its symptoms	2
2	37.	How and where is Creatinine biosynthesized in our body?	2
3	38.	What are transamination reactions? Explain with an example	2
3	39.	What is the role of pyridoxal phosphate in transamination reaction?	2
3	40.	What is SGOT? Give its significance	2
3	41.	What is SGPT? Give its significance	2
3	42.	What is oxidative deamination of amino acids? Explain with an example	2
3	43.	What is non oxidative deamination of amino acids? Explain with an example	2
3	44.	Give the metabolic significance of GDH and glutamate	2
3	45.	What is transdeamination of amino acids? Give example	2
3	46.	What is decarboxylation of amino acids? Give example	2
3	47.	What is desulfuration of amino acids? Give example	2
3	48.	What are glucogenic and ketogenic amino acids? Give examples	2
3	49.	How is chorismate synthesized from shikimate?	2
4	50.	What is feedback inhibition? Give example	2
4	51.	What is concerted inhibition? Give example	2
4	52.	What is enzyme multiplicity? Give example	2
4	53.	What is sequential feedback inhibition? Give Example	2
4	54.	What is the role of Transglutaminase?	2
4	55.	How does Glutamate dehydrogenase regulate urea cycle?	2
4	56.	How does ammonia enter urea cycle? Give the reaction	2
4	57.	What causes Alkaptonuria? Explain	2
4	58.	What causes Maple syrup urine disease? Explain	2
4	59.	What causes phenylketonuria? Explain	2
5	60.	What are nucleotides and nucleosides? Give examples	2
5	61.	Give the sources of atoms in purine rings with structure	2
5	62.	Give the sources of atoms in pyrimidine rings with structure	2
5	63.	What is the significance of cAMP?Give its structure	2
5	64.	What is the significance of ATP?Give its structure	2
5	65.	How is the conversion of IMP to other nucleotides regulated?	2
	66.	Write the reactions which involves xanthine oxidase	2
5			

	60	WHAT A GOLD A GO	2
5	68.	What is secondary gout? Give the associated complications	2
5	69.	What is the significance of Allopurinol?	2
5	70.	What is Pseudogout? Give the associated complications	2
5	71.	What is HGPRT? Give its significance.	2
5	72.	How are Nucleotides converted to Deoxynuclotides?	2
5	73.	Write a note on the action of methotrexate	2
6	74.	Give the structure Of NAD+. Add a note on its biological significance	2
6	75.	Give the structure Of FAD. Add a note on its biological significance	2
6	76.	Give the structure Of Coenzyme A. Add a note on its biological significance	2
6	77.	What are Polyamines? Give examples and their biological significance.	2
1	78.	Explain briefly the nitrogen cycle.	5
1	79.	Briefly explain the role of nitrogenase complex in fixing atmospheric nitrogen along with its regulation and energetics.	5
1	80.	Give a detailed account on the root nodule formation in leguminous plants.	5
2	81.	Discuss the cellular functions of protein degradation and criterias for protein degradation.	5
2	82.	Explain Ubiquitin-Proteosome Pathway of protein degradation.	5
2	83.	Explain lysosomal pathway of protein degradation.	5
2	84.	Explain the Biosynthesis of N linked Glycoproteins	5
2	85.	Discuss Glycoprotein ERAD functioning.	5
2	86.	Give a detailed account on lysosomal catabolism of glycoproteins.	5
2	87.	Explain the Biosynthesis of O linked Glycoproteins.	5
2	88.	Give the biosynthetic pathway for keratan sulfate.	5
2	89.	Give the biosynthetic pathway for chondroitin sulfate.	5
2	90.	Give the biosynthetic pathway for heparan sulfate.	5
2	91.	Discuss on Proteoglycans degradation.	5
2	92.	Explain the Non Ribosomal Peptide Synthesis of Glutathione.	5
2	93.	Explain the Non Ribosomal Peptide Synthesis of Gramicidine.	5
2	94.	Give a detailed account on Biosynthesis of Heme And Porphyrins.	5
2	95.	Give a detailed account on Degradation of Heme And Porphyrins.	5
2	96.	Comment on the Biosynthesis of Creatine.	5
3	97.	Briefly explain the General Mechanisms of Amino Acid Metabolism.	5
3	98.	Write the biosynthetic pathway for Glutamine	5
3	99.	Write the biosynthetic pathway for Proline	5
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3	100.	Write the biosynthetic pathway for Arginine	5
3	101.	Write the biosynthetic pathway for Glycine	5
3	102.	Write the biosynthetic pathway for Serine	5
3	103.	Write the biosynthetic pathway for Threonine	5
3	104.	Write the biosynthetic pathway for Aspartate	5
3	105.	Write the biosynthetic pathway for Asparagine	5
3	106.	Write the biosynthetic pathway for Alanine	5
3	107.	Write the biosynthetic pathway for Valine	5
3	108.	Write the biosynthetic pathway for Leucine	5
3	109.	Write the biosynthetic pathway for Isoleucine	5
3	110.	Write the biosynthetic pathway for Tryptophan	5
3	111.	Write the biosynthetic pathway for Phenlyalanine	5
3	112.	Write the biosynthetic pathway for Tyrosine	5
3	113.	Write the biosynthetic pathway for Histidine	5
3	114.	Give the degradative pathway for Glutamine	5
3	115.	Give the degradative pathway for Proline	5
3	116.	Give the degradative pathway for Arginine	5
3	117.	Give the degradative pathway for Glycine	5
3	118.	Give the degradative pathway for Serine	5
3	119.	Give the degradative pathway for Threonine	5
3	120.	Give the degradative pathway for Aspartate	5
3	121.	Give the degradative pathway for Asparagine	5
3	122.	Give the degradative pathway for Alanine	5
3	123.	Give the degradative pathway for Lysine	5
3	124.	Give the degradative pathway for Alanine	5
3	125.	Give the degradative pathway for Valine	5
3	126.	Give the degradative pathway for Leucine	5
3	127.	Give the degradative pathway for Isoleucine	5
3	128.	Give the degradative pathway for Tryptophan	5
3	129.	Give the degradative pathway for Phenlyalanine	5
3	130.	Give the degradative pathway for Tyrosine	5
3	131.	Give the degradative pathway for Histidine	5
4	132.	Summarise the regulation of amino acid biosynthesis	5
4	133.	Explain Transglutaminase Cycle. Give its significance	5
4	134.	Give a detailed account on urea cycle	5
4	135.	Explain the complications in Phenylketonuria along with symptoms and treatment	5
4	136.	Explain the complications associated with Maple syrup urine disease and add a note on its symptoms and treatment	5
4	137.	Explain the complications associated with Alkaptonuria. Add a note	5

5	138.	Give a detailed account on salvaging of purines and pyrimidines	5
5	139.	De Novo Biosynthetic Pathways For Purines	5
5	140.	De Novo Biosynthetic Pathways For Pyrimidines	5
5	141.	Comment on the degradation of Purines	5
5	142.	Comment on the degradation of Pyrimidines	5
5	143.	Give a detailed account on gout	5
5	144.	Give a detailed account on Lysch-Nyhan Syndrome	5
6	145.	Briefly explain the biosynthesis Of NAD+. Add a note on its biological significance	5
6	146.	Briefly explain the biosynthesis Of FAD. Add a note on its biological significance	5
6	147.	Briefly explain the biosynthesis Of Coenzyme A. Add a note on its biological significance	5
6	148.	Describe the biosynthetic pathway of spermine. Add a note on its biological significance and its regulation	5
6	149.	Describe the biosynthetic pathway of spermidine. Add a note on its biological significance and its regulation	5

Q.P Code: 54201 St. Philomena's College (Autonomous) Mysore

Subject: BIOCHEMISTRY Title: NITROGEN METABOLISM (HC) The 3 Hours PART -A Answer any TEN the following Questions: What are Ketogenic and glucogenic amino acids? Give example. How are nitrate and ammonium ions assimilated? What are polyamines? Give example. What are purines and Pyrimidines? Give the structure of FAD and give one biological importance of it. What are transamination reactions? What is symbiotic and asymbiotic nitrogen fixation? What is SGPT? Give its significance. Why is nitrogen important in Biological systems? How shikimate is converted chorismate? Give the proteosome structure. PART -B Answer any FIVE of the following Questions: Explain urea cycle. How is coenzyme A biosynthesized? What is its Biological importance? What are secondary metabolites? What are their roles in plant physiology and in medicine?		III Semester M.Sc. Final Examination December - 2019
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b. What are secondary metabolites? What are their roles in plant physiology and in 5+5	A a	
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4. a. Comment on biosynthesis of Glycoprotein's.	5+5
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 b. Explain nitrogen cycle. 5. a. How are proteins degraded by Ubiquitin proteosome pathway? 	5+5
5. a. How are proteins degraded by Conquisite segulated?	515
b. What is nitrogenase complex? How is it regulated?	
6. a. Give a detailed account on Histidine biosynthesis.	ion of purine 5+5
Garantain salvage pathway of purines and continuent	
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biosynthesis. 7. a Comment on the disorders of nucleotide biosynthesis.	5+5
7. a Comment on the disorders of soline	3.3
b. Give the degradative pathway of valine.	
8. a. Briefly explain the following conditions	
i) MSUD	
ii) Alkaptonuria	5+5
b. Comment on Pyrimidine Biosynthesis.	
b. Comment on Pyrimidine	