

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 atmospheric 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
5	66.	Write the reactions which involves xanthine oxidase	2
5	67.	What is primary gout? Give the associated complications	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 Deoxynucleotides?	2
5	73.	Write a note on the action of methotrexate	2
6	74.	Give the structure Of NAD <sup>+</sup> . 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 criteria for protein degradation.	5
2	82.	Explain Ubiquitin-Proteasome 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

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 Phenylalanine	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 Phenylalanine	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 on its symptoms and treatment	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 <sup>+</sup> . 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  
III Semester M.Sc. Final Examination December - 2019

Subject: BIOCHEMISTRY

Title: NITROGEN METABOLISM (HC)

Time: 3 Hours

Max Marks: 70

PART -A

Answer any TEN the following Questions:

10×2=20

+5  
3+4

5+5

5+5

5+5

5+5

1. a. What are Ketogenic and glucogenic amino acids? Give example.
- b. How are nitrate and ammonium ions assimilated?
- c. What are polyamines? Give example.
- d. What are purines and Pyrimidines?
- e. Give the structure of FAD and give one biological importance of it.
- f. What are transamination reactions?
- g. What are heterocyclic compounds? Give example.
- h. What is symbiotic and asymbiotic nitrogen fixation?
- i. What is SGPT? Give its significance.
- j. Why is nitrogen important in Biological systems?
- k. How shikimate is converted chorismate?
- l. Give the proteosome structure.

PART -B

Answer any FIVE of the following Questions:

5×10=50

2. a. Briefly explain root nodule formation in legumes.
- b. Explain urea cycle.
3. a. How is coenzyme A biosynthesized? What is its Biological importance?
- b. What are secondary metabolites? What are their roles in plant physiology and in medicine?

PTO

4. a. Comment on biosynthesis of Glycoprotein's. 5+5  
b. Explain nitrogen cycle.
5. a. How are proteins degraded by Ubiquitin proteasome pathway? 5+5  
b. What is nitrogenase complex? How is it regulated?
6. a. Give a detailed account on Histidine biosynthesis. 5+5  
b. Briefly explain salvage pathway of purines and comment on the regulation of purine biosynthesis.
7. a.. Comment on the disorders of nucleotide biosynthesis. 5+5  
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.

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