Grant Government Medical College, Mumbai

2nd Internal Assessment Examination- 15th April 2025

BIOCHEMISTRY

Total Duration: Section A+B= 3 Hrs **Section A & B:**100 Marks

Section A & Section B

Instructions:

1. *Use black ball point pen only.*
2. *Do not write anything on the blank portion of the question paper. If anything is written, such type of act will be considered as an attempt to resort to unfair means.*
3. *All questions are compulsory.*
4. *The number to the right indicates full marks.*
5. *Draw diagrams wherever necessary*
6. *Use a common answerbook for all sections.*

Section A - MCQ **20 Marks**

Section B **80 Marks**

Que 2. Structured Long Essay Question (All compulsory) **1 x 12M = 12**

a. What are the important substances derived from Glycine? Describe the steps by which the specialized products are synthesized (2+10)

Que 3. Reasoning Questions (All compulsory) **5 x 4M = 20**

a. Why does a vitamin B12 deficiency lead to megaloblastic anaemia despite its role in DNA synthesis?

b. Why do patients with cyanide poisoning suffer from cellular hypoxia despite normal oxygen levels in the blood?

c. Why is glucose-6-phosphate dehydrogenase (G6PD) deficiency more prevalent in males and how does it affect red blood cells?
(2+2)

d. Why does a person with uncontrolled diabetes mellitus experience rapid fat metabolism and ketoacidosis?

e. Why does protein-energy malnutrition- Kwashiorkor lead to edema despite normal calorie intake?

Que 4. Short Notes (Any 4 out of 5) **4 x 5M = 20**

a. A 55-year-old chronic alcoholic is admitted to the hospital with complaints of anxiety, confusion, memory loss, and impaired coordination. On examination, he exhibits nystagmus and altered mental status, raising suspicion of a metabolic or nutritional deficiency.

i. Identify the most probable diagnosis 1M
ii. Explain the biochemical basis of this condition 2M
iii. List the investigations necessary to confirm the diagnosis. 1M
iv. Provide dietary and lifestyle recommendations for managing this condition. 1M

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b. A newborn presents to the hospital with a history of convulsions, cataracts, jaundice, vomiting, and irritability. On clinical examination, the liver is enlarged. Laboratory investigations reveal the presence of reducing sugars in urine, suggesting an abnormality in carbohydrate metabolism.

i. Identify the most probable clinical condition. 1M
ii. Explain the underlying biochemical defect in this disorder. 2M
iii. Describe the biochemical basis of the observed signs & symptoms. 1M
iv. Which biochemical test would confirm the diagnosis? 1M

c. Metabolic fate of pyruvate.

d. Describe the propionate pathway.

e. Write ethical aspects of clinical communication.

Que 5. Short Notes (Any 4 out of 5) 4 x 7M = 28

a. Elaborate the role of lipoproteins in lipid transport and write their clinical implications. (5+2)

b. Explain the biochemical basis of jaundice and its types. (3+4)

c. Von Gierke's Disease

d. Describe the composition and functions of ECM. How does the ECM contribute to tissue integrity and cellular communication? Discuss the role in wound healing. (3+2.5+1.5)

e. Discuss the role of special products formed from phenylalanine metabolism.