ANNEXURE II

Rajiv Gandhi University of Health Sciences, Karnataka

First Phase MBBS Degree examination

Model Question paper

Biochemistry (RS-4)

Draw a neat labelled diagram wherever necessary

Time= Three hours **Paper I** **Maximum marks= 100**

Long essays 2X10= 20 marks

1. A 30-year-old male came to the Physician with complaints of excessive hunger, weight loss and increased thirst since few months. Following results were obtained on testing-
   i. Blood: Random Blood Sugar- 400 mg/dL
   ii. Urine: Benedict's Test – Orange precipitate
   a. What is the probable diagnosis?
   b. What is the biochemical basis of symptoms?
   c. Name the lab tests used to monitor the patient after confirmation of diagnosis?
   d. Discuss the mechanism of regulation of blood glucose levels?

   (1+3+1+5=10 marks)
2. Discuss iron with respect to the following aspects-
   a. Dietary sources
   b. Absorption and transport
   c. Deficiency manifestations
   d. Laboratory findings in deficiency (1+5+2+2=10 marks)

Short essays (10X5= 50 marks)

3. A 50-year-old male presented to emergency medicine department with complaints of severe chest pain and sweating since 6 hours. After further examination and testing, he was diagnosed as having Myocardial infarction.
   a. What would be the best marker for diagnosing Myocardial infarction in this patient (1 mark)
   b. What is the biochemical basis of using such a marker (3 marks)
   c. List other markers that have been used to diagnose myocardial infarction (1 mark)
4. A 60-year-old female presented with tingling and numbness in fingers, and muscle cramps in hands. On examination, Chvostek's and Trousseau's signs were observed. She had previously undergone Thyroidectomy for Grave's disease. Following results were obtained on testing-
   i. Serum Calcium- 6 mg/dL
   ii. Serum Phosphrous – 7 mg/dL

   a. What is your diagnosis? (1 mark)

b. What is the biochemical basis for symptoms and laboratory findings? (3 marks)
c. Name another mineral deficiency which has similar manifestations as the above (1 mark)

5. Discuss the metabolic changes in starvation.
6. Describe the mechanism of Oxidative phosphorylation
7. What are mucopolysaccharides. Mention the composition and biological importance of any 4 mucopolysaccharides. (1+4 marks)
8. Discuss the functions and clinical significance of lysosomes
9. Prescribe a balanced diet for a 70 kg male with moderate physical activity
10. Discuss the β-oxidation of fatty acids under following headings-
    a. Biological significance (0.5 marks)
    b. Steps (4 marks)
    c. Energy released by oxidation of one molecule of palmitic acid (0.5 marks)
11. Give biochemical reasons for the following
    a. Neurological and dermatological manifestations in Vitamin B6 deficiency (2 marks)
    b. A patient on Anti-tuberculous treatment may develop Vitamin B6 deficiency (1 mark)
    c. Neurological manifestations in Vitamin B12 deficiency (2 marks)
12. Explain the biochemical basis for the following-
    a. LDL is called the 'bad' cholesterol and HDL is called the "good' cholesterol (2 marks)
    b. Fasting hypoglycemia and hyperuricemia in Von Gierke disease (2 marks)
    c. Lung surfactant prevents Respiratory distress syndrome (1 mark)

Short answers (10X3= 30 marks)

13. Explain the renal regulation of pH with diagram.
14. Mechanism of Renin angiotensin system in maintaining fluid balance
15. Discuss briefly Vitamin B1 with respect to deficiency manifestations and laboratory findings in deficiency (2+1 marks)
16. a. List two functions of collagen. (1 mark)
    b. Mention the nature of collagen abnormality in (2 marks)
        i. Osteogenesis Imperfecta
        ii. Ehlers- Danlos Syndrome
17. Briefly explain Kohsland's induce fit theory
18. Name essential fatty acids. Mention their biological significance (1+2 marks).
19. Differentiate between high and normal anion gap metabolic acidosis with an example.
20. Give biochemical reasons for the following-
    a. Selenium has a sparing action on Vitamin E (1 mark)
    b. Fluoride is used as preservative for blood glucose (2 marks)
21. Explain the metabolic changes leading to production of ketone bodies.
22. Give biochemical reasons for the following
    a. Urine is acidic in metabolic alkalosis (1 mark)
    b. Hyperkalemia is generally associated with metabolic acidosis (1 mark)
    c. Hyperkalemia is a critical alert in laboratory (1 mark)