

SRI DEVARAJ URS ACADEMY OF HIGHER EDUCATION AND RESEARCH
(A Deemed to be University)

MBBS Phase I Supplementary Examination November 2025

Time: 150 Minutes

Max Marks: 80 Marks

Biochemistry Paper I

QP CODE: C1031

Your answer should be specific to the question asked

Draw neat labelled diagrams wherever necessary

Long Essay

2 X 10 = 20 Marks

1. Describe the steps of urea cycle. Add a note on disorders of urea cycle. (7+3)
2. A 21-year-old male medical student skips breakfast and attends a long morning lecture. By noon, he feels dizzy, tired, and irritable. His blood glucose level is measured and found to be at the lower end of normal. However, he recovers quickly after eating a carbohydrate-rich meal.
 - a. Describe the dynamics of blood glucose regulation.
 - b. Explain the role of hormones in achieving this. (5+5)

Short Essay

12 X 5 = 60 Marks

3. Describe how professionalism influences the physician-patient relationship (5)
4. Briefly describe the fluid mosaic model of plasma membrane with a neat labelled diagram. (5)
5. How is each of the following compounds detoxified: a) Aspirin b) Ethyl alcohol
c) Barbiturates d) Bilirubin e) Benzoyl CoA
6. Define Antioxidants. Describe the role of Glutathione peroxidase as free radical scavenger enzyme. (1+4)
7. What is meant by Hypoglycaemia? Explain its causes as well as hereditary disorders in which Hypoglycaemia is seen
8. Write the differences between coagulation and flocculation and the differences between precipitation and coagulation?
9. What are Glycosides? List any four Glycosides. Describe the biomedical importance of Digoxin and phlorhizin. (1+2+1+1)
10. Describe the structural of collagen. Write the any 3 functions of collagen. (2+3)
11. A 34YO male presented with loss of taste and smell initially and developed severe cold after 3 days. The chest x-ray revealed congestion in lungs. He revealed travel history from UAE. Upon CT Scan and biochemical test for Covid 19 IgG, RT PCR was advised as confirmatory test of diagnosis for Covid- 19.
Explain the types of vaccines developed for prevention of severity in developing Covid-19 infection.

P.T.O

12. A 16 year old boy came for consultation to a Physician. He complained that he was feeling lethargic and practically had no physical activity. He had been eating and sleeping excessively for months. On questioning, he reported that both his parents were obese. The boy also had truncal obesity. BMI was 26 kg/m². His BP was normal. FBS and Thyroid profile were normal but serum cholesterol and triglycerides were high. A diagnosis of obesity was made and a diet chart given to the patient.

- a) What are the various causes of obesity?
- b) What are the various risk factors associated with obesity?
- c) List two treatments suggested for obesity (2+2+1)

13. A six-month-old baby on exclusive breast feeding developed bone deformities such as bow legs and pigeon chest. On enquiry the mother gave a history of premature delivery.

- a) What is your diagnosis?
- b) Which vitamin deficiency causes this disease?
- c) What are the biochemical functions of this vitamin? (1+1+3)

14. A 32 year male agriculturist working vigorously in the fields starts feeling lightheaded. He drinks a glass of sugar water and feels better. Considering the fact that there will be competition for the glucose to be stored in his liver as glycogen or being used as energy in his muscles

- a. Define K_m and V_{max} .
- b. What is the best explanation regarding the fate of the glucose in the sugar water in the context of the K_m value of glycolytic 12enzymes? (2+3)

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Biochemistry Paper II

QP CODE: C1032

Your answer should be specific to the question asked

Draw neat labelled diagrams wherever necessary

Long Essay

2 X 10 = 20 Marks

1. Explain various mechanisms by which Acid- Base balance is maintained in the body.
2. A 50-year man presented with complaints of pain and swelling of the left great toe. On examination swelling was observed in the left first metatarsophalangeal joint and in other small joints. Personal history states that he is a non-vegetarian and consumes alcohol regularly. Investigation revealed serum uric acid level of 12 mg/dl.
 - a. What is the probable diagnosis?
 - b. Name the likely enzyme defect.
 - c. What is the normal reference range of serum uric acid?
 - d. Describe the biochemical basis of the symptoms noticed in this condition.
 - e. Write the steps in inosine monophosphate synthesis. (1+1+1+2+5)

Short Essay

12 X 5 = 60 Marks

3. What are the different types of DNAs? Describe the structure of B-DNA with a neat labelled diagram. (1+4)
4. Name ketone bodies. Explain the pathophysiology of Ketoacidosis. (1+4)
5. Write any Five differences between DNA and RNA. (5)
6. Write a neat labelled diagram of tRNA structure add a note on its importance translation (3+2)
7. How do physicians contribute to community health initiatives and preventive care programs?
8. What is Lipoprotein (a)? Mention its significance. What is the normal reference range of (a) serum total cholesterol level (b) serum triglycerides (c) HDLc (d) LDLc? (2+1+2)
9. Write the reference range for plasma osmolality. List any two conditions where plasma osmolality is increased. Mention the factors determining plasma osmolality. (1+2+2)
10. Arachidonic acid is not a true essential fatty acid. Justify. Give the basis of essentiality and the functions of EFA (1+1+3)

P.T.O

11. A 12-year-old girl presented with excessive tiredness, poor appetite, inability to concentrate and tingling sensations, on examination there was pallor. Laboratory diagnosis revealed decreased haemoglobin, ferritin and MCV. Total iron binding capacity & transferrin was increased. A Diagnosis of Iron Deficiency Anaemia was made and started on Treatment.
- a) Describe the process of absorption and transportation of Iron in the Body.
 - b) Explain Mucosal Block Theory. (4+1)
12. A 45 years obese female presents to the clinic complaining of tiredness. She has cold intolerance, slurred speech, hoarse voice and constipation, with history of weight gain. On examination, she is afebrile, pulse rate 52/min, regular, non-pitting pedal oedema with an enlarged, non-tender midline swelling on her anterior aspect of the neck. Her reflexes are diminished and her skin is dry.
- a) What is most likely diagnosis?
 - b) List the Biochemical investigation to be estimated in this case.
 - c) Describe the mechanism of action of the hormones causing this condition (1+2+2)
13. A 15-year girl is brought to the emergency room by her mother with complaints of bilateral thigh and hip pain. She denies any recent trauma or excessive exercise. On examination, she is afebrile and in no acute distress. No one in her family has similar episodes. Her conjunctiva and mucosal membranes are slightly pale in coloration. The remainder of her examination is completely normal. Her white blood cell count is elevated at 17,000/mm³, and her haemoglobin (Hb) level is decreased at 7.1 g/dL. The urinalysis demonstrated an abnormal number of numerous bacteria. Diagnosis of sickle cell disease was made.
- a. Explain the molecular genetics of Sickle cell disease.
 - b. Explain the biochemical mechanisms in various clinical findings of Sickle cell disease. (2+3)
14. A gold mine worker was brought in an unconscious state to emergency room after a blast in the mine. He had increased breathing, restlessness and he was diagnosed with cyanide poisoning. Cyanide is a known inhibitor of electron transport chain.
- a. Describe the components of electron transport chain.
 - b. Write a note on inhibitors of electron transport chain. (3+2)