



RAN - 2006000101030001

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**Ist MBBS Examination November - 2023**

**Biochemistry : Paper - I**

**Set - 1**

**Time: 3 Hours ]**

**[ Total Marks: 100**

**સૂચના : / Instructions**

(1)

નીચે દર્શાવેલ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.  
**Fill up strictly the details of signs on your answer book**

Name of the Examination:

Ist MBBS

Name of the Subject :

Biochemistry : Paper - I - Set - 1

Subject Code No.: 2006000101030001

Seat No.:

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Student's Signature
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- (2) All questions are compulsory
- (3) Each MCQ has only one correct answer
- (4) One mark for correct answer. No negative marking.

**Section - A : MCQ**

**20 Marks**

1. The subcellular organelle known as 'Suicidal bag' is :
  - a) Peroxisome
  - b) Lysosome
  - c) Centrosome
  - d) Nucleosome
2. Membrane lipids constitute:
  - a) Phospholipids
  - b) Sphingolipids
  - c) Cholesterol
  - d) All of the above
3. The glycosaminoglycan found in synovial fluid is:
  - a) Hyaluronic acid
  - b) Heparin
  - c) Heparan sulphate
  - d) Keratan sulphate
4. Which of the following carbohydrate(s) is/are not digested by humans?
  - a) Cellulose
  - b) Hemicellulose
  - c) Pectin
  - d) All of the above



15. Total pCO<sub>2</sub> is increased in :
- a) Respiratory acidosis                      b) Metabolic alkalosis  
c) Metabolic acidosis                         d) Respiratory alkalosis
16. Proteinuria is defined as :
- a) ≥ 50 mg/day protein in urine  
b) ≥ 100 mg/day protein in urine  
c) ≥ 150 mg/day protein in urine  
d) ≥ 200 mg/day protein in urine
17. Parameter(s) assessed to test the synthetic function of liver :
- a) Prothrombin                                      b) Ceruloplasmin  
c) α<sub>1</sub>-Antitrypsin                                 d) All of the above
18. The RDA for proteins is :
- a) 15 - 25gm/Kg/day                              b) 0.75 - 0.8 gm/Kg/day  
c) 0.2 – 0.4 gm/Kg/day                         d) 5 - 10 gm/Kg/day
19. Cytochrome P450 is involved in detoxification by :
- a) Hydrolysis                                        b) Oxidation  
c) Conjugation                                      d) Reduction
20. The following are the characteristics of free radicals, EXCEPT :
- a) Highly reactive  
b) Short half-life  
c) Cytotoxic  
d) Not produced during normal metabolism

**Section - B**

**40 Marks**

**Instructions for section B and C :**

- (1) Use blue/black ball point pen only.  
(2) The numbers to the right indicates full marks.  
(3) Draw diagrams wherever necessary.

**Q. 2. Long Answer Questions. (ANY TWO) (2 × 10 = 20)**

- A. Discuss source, RDA, metabolism (absorption, transport, and storage) and functions of Iron. Add a note on various anemias related to iron deficiency and overload. **(1 + 1 + 3 + 2 + 3 = 10)**

- B. Explain beta-oxidation of 16 carbon atom saturated fatty acid. How it is regulated? Explain how many ATPs are synthesized? (6 + 2 + 2)
- C. Define glycogenesis and glycogenolysis. Write the reactions of glycogenesis and glycogenolysis in liver, Add a note on Glycogen storage disorders. (2 + 5 + 3)

**Q. 3. Write Brief Answer / Justifications / Biochemical basis. (ANY TEN) (10 × 2 = 20)**

- a) Glucose is required for the absorption of Na<sup>+</sup>.
- b) Muscle glycogen cannot contribute to blood glucose level.
- c) Respiratory Distress Syndrome (RDS) is observed in premature babies.
- d) HDL cholesterol is good cholesterol.
- e) In uncontrolled diabetes mellitus cataract is developed at early age
- f) Aspirin is used as anti-inflammatory drug.
- g) Brain cannot utilise fatty acid for energy purpose.
- h) Inhibitors of ETC?
- i) Why there is oedema in protein malnutrition?
- j) Blood is collected in fluoride bulb for estimation of blood glucose level.
- k) Examples of ketone bodies and functions (any two).

**Section - C**

**40 Marks**

**Q. 4. Short answer questions. (ANY FOUR) (4 × 5 = 20)**

- A. Renal Function Test.
- B. Outline doctor patient communication. Add a short answer on components of communication in medical encounters.
- C. Protein Energy Malnutrition (PEM).
- D. Detoxification reactions.
- E. Complications of Diabetes mellitus.

**Q. 5. Clinical cases. (All compulsory)****(10 × 2 = 20)****Case - 1:**

A 65 year old man was brought to the hospital in a semiconscious state. The patient displayed a typical hyperventilatory breathing pattern with fruity smell in his breath. The pulse was feeble and hypotension was noted. The laboratory reports were ordered and were as below:

pH: 7.10, pCO<sub>2</sub> 39.0 mm of Hg, HCO<sub>3</sub><sup>-</sup> : 14.0 mmol /L,  
Serum Na<sup>+</sup> : 135.5 mmol /L, K<sup>+</sup> : 6.5mmol/L, Cl<sup>-</sup> : 90mmol/L,  
Random Blood Sugar : 451 mg/dl.

- 1) Identify the acid base disorder in above case with justification?
- 2) Calculate Anion Gap. Give any 2 causes of High Anion Gap Metabolic Acidosis.
- 3) Give biochemical basis of 'fruity smell' in this patient.
- 4) Explain the basis of hyperkalemia in this case.
- 5) Mention normal serum values for pH & blood gases.

**Case - 2:**

A 40-year man consulted an ophthalmologist to obtain a prescription for reading glasses. The ophthalmologist noticed that the patient had bilateral arcus senilis and recommended to consult physician. Physician noticed that he also had tendon xanthomata arising from Achilli's tendons. Family history revealed his father had died of heart attack at the age of 40. An ECG taken at rest was normal but ischemic changes developed on exercise. Analysis of fasting blood for lipids showed the following :

Parameter	Patient's results	Normal range
Total cholesterol	530 mg/dL	< 200 mg/dl
Serum triglycerides	110mg/dL	< 150 mg/dl
LDL cholesterol	440 mg/dL	< 130 mg/dl
HDL cholesterol	64 mg/dL	> 60 mg/dl

1. This patient is suffering from which type of hyperlipidemia?
2. What is the possible cause of this condition?
3. Justify- LDL is termed as bad cholesterol.
4. What are the apo proteins? Mentions its functions.
5. Write down the important functions of cholesterol.