RAN-2006000101030001

RAN-2006000101030001

I[st] MBBS Examination April - 2023

Biochemistry - Paper-I

Set - 3

સૂચના : / Instructions

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

Name of the Examination:
☛ I[st] MBBS

Name of the Subject :
☛ Biochemistry - Paper-I

Subject Code No.: 2006000101030001

Seat No.:

Student's Signature

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

Section A **20 Marks**

Q. 1 MCQ

1. Which of the following is not a dietary essential nutrient?
   a. Linoleic acid b. Isoleucine
   c. Phenylalanine d. Cysteine

2. A patient came with lactose intolerance. He should be avoid all except:
   a. Yoghurt b. Skimmed milk
   c. Ice-cream d. Condensed milk

3. Most predominant anion in extracellular fluid:
   a. HCO_3^- b. Chloride
   c. HPO_3_ d. HPO_4^-

4. Which of the following is not belong to omega-6 family?
   a. Linoleic acid
   b. Alpha linolenic acid
   c. Arachidonic acid
   d. Gamma linolenic acid

5. Rothra's test used for detection of
   a. Ketones
   b. Glucose
   c. Protein
   d. Fatty acid

6. Bile acids are derivative of:
   a. Bilirubin
   b. Cholesterol
   c. Ketone body
   d. Fatty acids

7. Which glycosaminoglycan that serve as an anticoagulant?
   a. Dermatan sulfate
   b. Heparin
   c. Chondroitin sulfate
   d. Heparan sulfate

8. All of the following are used for gluconeogenesis except.
   a. Glycerol
   b. Acetoacetate
   c. Lactate
   d. Alanine

9. The organ which cannot utilize ketone bodies as fuel is
   a. Brain
   b. Cardiac muscle
   c. Skeletal muscle
   d. Liver

10. What is true about Basal Metabolic rate (BMR)?
   a. Increase in old age
   b. Similar for males and female
   c. Increased during exercise
   d. low in hyperthyroidism

11. Which of the following organelle has DNA?
   a. Lysosomes
   b. Peroxisomes
   c. Mitochondria
   d. Microsomes

12. Zinc is present in all enzymes EXCEPT:
   a. Alkaline phosphatase
   b. Amylase
   c. Carbonic anhydrase
   d. Carboxypeptidase

13. Which of the following is not synthesised in endoplasmic reticulum?
   a. Ganglioside
   b. Glycoproteins
   c. RNA
   d. Lipoproteins

14. Which of the following organelle can cause auto-digestion?
   a. Golgi bodies
   b. Peroxisome
   c. Microsomes
   d. Lysosomes

15. Which of the following fatty acids present in surfactant?
    a. Oleic acid b. Stearic acid
    c. Palmitic acid d. Arachidonic acid

16. Which amino acid can enter the TCA cycle as fumarate and oxaloacetate?
    a. Arginine b. Aspartate
    c. Glutamate d. Alanine

17. Which of the following is soluble and mobile?
    a. Coenzyme-Q b. Cytochrome c
    c. Cytochrome b d. Cytochrome a

18. Enzyme responsible for respiratory burst is:
    a. NADPH Oxidase b. Nitric oxide synthase
    c. Glutathione peroxidase d. Catalase

19. On overnight standing Cerebrospinal fluid forms 'cob-web' clot in:
    a. Fungal meningitis b. Staphylococcal meningitis
    c. Tuberculous meningitis d. Pneumococcal meningitis

20. Essential pentosuria is due to metabolic defect in:
    a. Glycolysis b. HMP Shunt
    c. Uronic acid pathway d. Glycogenolysis

Section B **40 Marks**

Instructions for section B & 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. Enumerate the name of ketone bodies. Explain ketogenesis and ketolysis. Add a note on ketosis. (1+6+3)

B. Describe the reactions of hexose monophosphate shunt pathway. Add a note on metabolic significance of this pathway. (6+4)

C. Describe sources, daily requirement, absorption, biochemical functions and metabolic disorders of Iron. (1+1+2+3+3)

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

a) Fruity odour of breath is characteristic of Diabetic ketoacidosis patients. Give reason.
b) Fluoride container used to collect blood sample for blood glucose estimation.
c) Metabolic adaptations in starvation.
d) Explain: copper is essential for normal collagen synthesis.
e) Serum Potassium should not be estimated in hemolysed blood sample.
f) Oral rehydration solution is contains both Glucose and Sodium chloride.
g) Substrate level phosphorylation.
h) Regulation of blood calcium level.
i) Combination of Rice and Dal known as complete protein diet.
j) Essential fatty acids.
k) Name insulin dependent glucose transporters and their tissue distribution.

Q. 4 **Short Answer Questions (ANY FOUR)** **(2×10 = 20)**

A. Detoxification reactions.
B. Inhibitors of Electron transport chain.
C. Liver function tests
D. Describe the protein energy malnutrition (PEM).
E. Write the elements of effective communication of doctor and patient.

Q. 5 **Clinical Cases (ALL COMPULSORY)** **(2×10 = 20)**

Case 1:

11-month-old boy brought to the paediatrics OPD by parents with complaints of on and off vomiting and lethargy for past 2 months. The mother had also noticed abdominal swelling while giving bath to baby. The developmental milestones were delayed. On examination, boy had a round face with fatty chick (doll like face) and hepatomegaly. Paediatrician made diagnosis of Von Gierke's Disease. Blood investigations were as follows:

Lab parameter	Observed values	Reference range
Blood glucose:	55 mg/dL	70-110 mg/dL
Lactic acid:	3 mmol/L	less than 2 mmol/L
Total cholesterol	325 mg/dL	less than 200 mg/dL
Uric acid:	8.5 mg/dL	3.5-7.5 mg/dL

Questions:

1) What is a Von Gierke's disease? What is a cause for it?
2) What is a reason of hypoglycemia and hypercholesterolemia in this patient?
3) What is a reason of hyperuricemia in this patient?
4) Give name of two-glycogen storage disease with enzyme deficiency other than Von Gierke's Disease.
5) Why muscle glycogen does not contributed to blood glucose level?

Case 2:

A male patient brought to casualty by his relative with altered sensorium. He was breathing heavily. His Blood sugar measured by Glucometer and it was 653 mg/dl. Physician made a diagnosis of diabetes ketoacidosis.

ABG report shows following results.

ABG Finding	Observed values	Reference range
pH:	: 7.20	(7.35-7.45)
HCO_3^-	12 mmol/L	(22-26 mmol/L)
pCO_2	23 mm of Hg	(35-45 mmHg)
Sodium	130 mmol/1	
Potassium	3.9 mmol/1	
Chloride	:95 mmol/1	

Questions:

1) What is a reference range of fasting blood sugar and blood pH?
2) Interpret the above ABG report with explanation.
3) What is the compensatory mechanism in this case?
4) Calculate and comment on the anion gap.
5) Give two causes of metabolic alkalosis.