Question Paper

Exam Date & Time: 31-Jul-2024 (10:20 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST PROFESSIONAL YEAR MBBS DEGREE EXAMINATION - JULY/AUGUST 2024
SUBJECT : BI 101THP1 : BIOCHEMISTRY - PAPER - I
(PY - 1 CBME SCHEME)

Marks: 80 **Duration: 160 mins.**

Answer all the questions.

LONG QUESTION -

1. A 6-month-old infant was admitted to emergency department. Mother gave the history that baby is vomiting frequently. There is refusal of feed, baby is lethargic and irritable for one week. Hyperammonemia was detected on blood investigation.

1A) List all the causes of hyperammonemia? (2)

1B) What are the source of ammonia in our body (1)

1C) Give reasons for toxicity of ammonia in our body (2)

1D) Describe the detoxification of ammonia in our body with the help of a suitable diagram (5)

2A) Explain the metabolism of HDL. (5)

2B) Write the normal serum levels of HDL and LDL. (2)

2C) Explain the consequences of elevated LDL on coronary arteries. (2)

2D) Describe the mechanism of action of **ONE** drug used in the treatment of hyperlipidemia. (1)

SHORT ESSAY

3A) 25-year-old male suffering from malaria was treated with primaquine. During treatment he developed weakness and breathlessness and hemolytic anemia after taking primaquine. His Lab report shows- Hb 7 g%, serum Total Bilirubin was 5 mg%. Serum Unconjugated Bilirubin 3.7 mg% Discuss the case and interpret the lab report. (2+2 = 4 marks)

3B) Which amino acid can produce Niacin. Explain the biochemical basis of carcinoid syndrome and its clinical features. (1+3 = 4 marks)

3C) Name **FOUR** products of cholesterol. Describe synthesis of **ONE** product. (2+2 = 4 marks)

3D) A 63-year-old female presented in medical OPD with mild epigastric pain for past 3 months, she was using analgesic ibuprofen for her arthritis for last 6 months. Now she presented with giddiness and having black stool at times. Doctor advised her to stop the medication to prevent the gastric bleed.

i) Explain the mechanism of ibuprofen as an analgesic and anti-inflammatory. (2)

ii) Describe the effect of prostaglandin on gastric mucosa. (2)

3E) A 60-year-old male comes to the emergency with history of chest pain. He was diagnosed to have myocardial infarction. He was treated with **aspirin** and **streptokinase**. Explain the biochemical basis behind treatments (2+2 = 4 marks)

3F) Define isoenzymes. Describe the clinical significance of various isoenzymes of LDH. (1+3 = 4 marks)

3G) i) Explain the diagnostic applications of **TWO** enzymes. (2)

ii) Explain the mechanism of suicide inhibition with example. (2)

3H) Define and write the significance of Km value (1+3 = 4 marks)

3I) What is the difference between oxidative and substrate level phosphorylation. Explain the mechanism of ionophores with suitable example. (2+2 = 4 marks)

3J) Explain-

i) Biochemical basis and clinical features of Alkaptonuria (2)

ii) Cellulose cannot be digested by human being but is included in the diet. (2)

3K) Give reasons

i) Hyaluronidase is known as spreading factor. (2)

ii) Snake venom causes RBC hemolysis. (2)

3L) What is fatty liver? Write the causes of fatty liver. Name **FOUR** lipotropic factor. (1+1+2 = 4 marks)

3M) Applying your knowledge of AETCOM module, explain the role of the doctor as

i) Health care provider (2)

ii) Preventive care supporter (2)

3N) Describe the composition and mechanism of action of oral rehydration fluid with a help of a diagram. (4)

3O) Explain the metabolism of methionine. Add a note on the significance of S-adenosyl methionine with **TWO** examples. (2+2 = 4 marks)

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Question Paper

Exam Date & Time: 02-Aug-2024 (10:20 AM - 01:00 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

FIRST PROFESSIONAL YEAR MBBS DEGREE EXAMINATION - JULY/AUGUST 2024
SUBJECT: BI 101THP2 - BIOCHEMISTRY - PAPER - II
(PY - 1 CBME SCHEME)

Marks: 80 **Duration: 160 mins.**

Answer all the questions.

1. A 45-year-old sailor presented to OPD with **swollen and bleeding gums**. He is unable to walk properly due to **swelling in his knees**. He has been eating bread and jam every day for last 6 months. He didn't consume any fresh fruits or vegetables. On examination he was pale. **Hb level was 7 g/dl.**

1A) Name the nutrient deficient in this case (0.5)

1B) Discuss the dietary sources, RDA, and therapeutic uses of the deficient nutrient. (0.5+0.5+1.5 = 2.5)

1C) Explain the reasons for anemia in the above case (3)

1D) Discuss the mucosal block theory for absorption of iron. (4)

2. Answer the following.

2A) Describe the process of replication in prokaryotic cells. Mention any ONE inhibitor of replication with its mechanism of action (5+2 = 7)

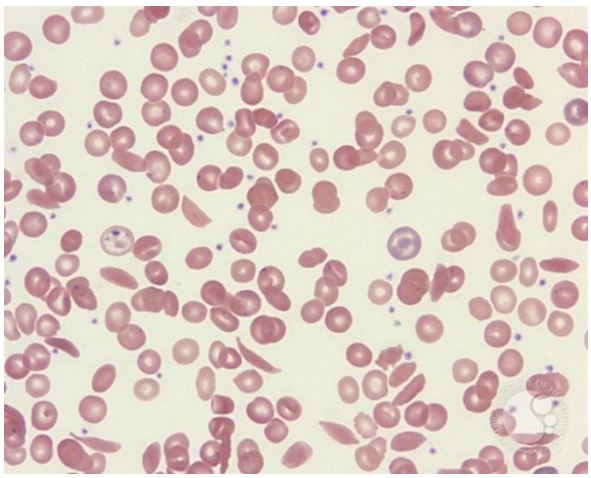
2B) List the DNA repair mechanisms (2)

2C) Enumerate any TWO diseases associated with defects in DNA repair. (1)

3A) i) What is microalbuminuria? Explain its clinical significance. (1+1 = 2)

ii) Explain why creatinine clearance is a better marker for renal function, when compared to urea clearance. (2)

3B) 8-year-old boy came with history of tiredness and yellowish discoloration of skin and sclera. On examination he had pallor and jaundice. On peripheral smear examination his blood showed as below.



i) Write the biochemical defect and name of the disorder. (0.5+0.5 = 1)

ii) Describe the biochemical basis for manifestation seen in above blood picture. (3)

3C) Write one function and one deficiency manifestation of Zinc, iodine, fluorine, selenium (1+1+1+1 = 4)

3D) A 23-year-old boy was suffering from pernicious anemia. His physician prescribed folic acid along with Vit B12 supplementation.

i) Justify the prescription (1)

ii) Explain the biochemical basis for the clinical manifestations of Vitamin B 12 deficiency. (3)

3E) A 30-year-old man was brought to the emergency in an unconscious state, following multiple episodes of vomiting. He had generalized muscle cramps and was dehydrated. Arterial blood gas analysis (ABG) showed -pH - 7.55, pCO2 - 40 mm Hg, HCO_3^--32 mEq/L.

i) Comment on the ABG Report and write the probable diagnosis. (2)

ii) Write a note on respiratory regulation of blood pH (2)

3F) Explain the biochemical functions of copper in our body. Enlist TWO clinical manifestations of Wilsons disease with its biochemical basis. (2+2 = 4)

3G) A 14-year-old girl presented with pain abdomen and neuropsychiatric symptoms. patient was found to have no photosensitivity. The patient had similar episodes in the past and is operated on twice in last 2 years for appendicectomy and exploratory laparotomy. All her symptoms begin after treating her for depression with barbiturates. ALA and PBG was detected in urine.

i) Write the probable disorder the girl is suffering in above presentation and the biochemical defect in this patient. (2)

ii) Give reason for exacerbation of symptoms on treatment with barbiturates. (1)

iii) Give reasons for absence of photosensitivity in this case. (1)

3H) A 8-year-old boy from low socioeconomic background living in a Mumbai slum came with history of difficulty in walking. On examination he had **rachitic rosary, bowed legs and knock knee.**

i) Name the deficient nutrient in the above case. (1)

ii) Discuss the synthesis and activation of this nutrient in our body (2)

iii) Give reason for the bowed legs in this case. (1)

3I) Give reasons.

i) Aspartate transaminase and alanine transaminase are elevated in Hepatocellular injury. (2)

ii) Cold intolerance occurs in hypothyroidism. (2)

3J) Explain any **FOUR** post translational modifications. (4)

3K) A 23-years-old women came with history of severe back pain and fracture after a trivial trauma. Her skull X-ray showed **punched out lesions**. Her urine showed Bence jones protein.

i) What is the probable diagnosis. (1)

ii) Draw a neat, labeled diagram of immunoglobulin (3)

3L) Define glycemic index. Discuss the importance of glycemic index in management of diabetes. (1+3 = 4)

3M) Give TWO examples of sources of dietary fiber in our diet. Justify the use of dietary fiber in balanced diet. (1+3 = 4)

3N) Write the principle of ELISA. Enumerate any FOUR diagnostic applications of ELISA. (2+2 = 4)

3O) Describe the commitment to lifelong learning as an important part of Physicians growth. (4)

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