2406000101030702-A
EXAMINATION OCTOBER 2024 (Supplementary Exam)
FIRST MBBS
BIO-CHEMISTRY (PAPER - II) (NEW) - LEVEL 3

[Time: As Per Schedule] **[Max. Marks:100]**

Instructions:

1. **Fill up strictly the following details on your answer book**
   a. Name of the Examination : **BACHELOR OF MEDICINE AND BACHELOR OF SURGERY (FIRST)**
   b. Name of the Subject : **BIO-CHEMISTRY (PAPER - II) (Level-3)**
   c. Subject Code No : **2406000101030702-A**
2. Sketch neat and labelled diagram wherever necessary.
3. Figures to the right indicate full marks of the question.
4. All questions are compulsory.

Seat No:

Student's Signature

Section –A

Q.1 Multiple choice questions (20 out of 20) **20**

1. Which of the following trace element has an antioxidant role?
   a. Selenium b. Nickle c. Chromium d. Zinc

2. Urine of a 12 years old boy gave a positive cyanide-nitroprusside test. He had renal stones. He is likely to have:
   a. Homocystinuria b. Cystinosis
   c. Hartnup's disease d. Renal glycosuria

3. Biotin is inhibited by:
   a. Isoniazid (INH) b. Methotrexate c. Dicoumarol d. Avidin

4. Ammonia is trapped in brain by:
   a. Glutamine synthetase reaction b. Glutaminase reaction
   c. Urea synthesis cycle d. Glutamate dehydrogenase reaction

5. Wernicke's disease & Beri Beri can be treated by administering:
   a) Thiamine b) Niacin c) Folic Acid d) Riboflavin

6. Minamata disease is caused by:
   a) Lead Poisoning b) Mercury Poisoning
   c) Aluminum Toxicity d) Arsenic Toxicity

7. Immunoglobulin present in secretions is:
   a) IgA b) IgM c) IgE d) IgG

8. Reversal of A/G ratio is seen in:
   a) Cirrhosis of liver b) Nephrotic Syndrome
   c) Dehydration d) Both A & B

9. The two nitrogen atoms of urea are
   a) Aspartate and glutamate b) Aspartate and ammonia
   c) Fumarate and aspartate d) Ammonia and glutamate

10. Which of the following nucleotide acts as second messanger in eliciting the hormonal action
   a) NAD+ b) B SAM c) ADP d) CAMP

11. Ammonia from brain is detoxified Gamma cysteinyl glycine is other
   a) Bradykinin b) Angiotensin c) Glutathione d) Oxytocin

12. The photosensitivity is not a feature of which of the following porphyria
   a) Congenital erythropoetic porphyria
   b) Porphyria cutenia tarda
   c) Acute intermittent porphyria
   d)Varigate porphyria

13. Which of the following enzyme is associated with the salvage pathway of purine nucleotide
   a) Ribonucleoside reductase b) Cyclohydrolase
   c) PRPP synthase d) HGPRT

14. Which of the following trace element has an antioxidant role?
   a. Selenium b. Nickle c. Chromium d. Zinc

15. The chief product of catabolism of purine in human being is
   a. Urea. b. Urica acid
   c. Hypoxanthine d. Beta aminoisobutyric

16. The drug of choice for primary gout is:
   a. Allopurinol b. Aspirin
   c. Colchicine d. Probenecid

17. Which protein is not present in plasma?
   a.Albumin. b. Fibrinogen
   c. Hemoglobin. d. Globulins

18. Genu valgum and Genu varus are characteristic feature of,
   a. Vitamin A deficiency b. Vitamin K deficiency
   c. Niacin deficiency d. Vitamin D deficiency

19. Triangular plaque or Bitot's spot is commonly seen in-
a. Retinol deficiency
b. Retinol toxicity
c. Diabetic retinopathy
d. Conjunctivitis

20. Amino acid used for the synthesis of serotonin hormone is -
a. Tyrosine b. Tryptophan c. Histidine d. Proline

Section –B

Q.2 Long Answer Questions (2 out of 3) **40**
2x10=20

1. Explain eukaryotic DNA organization. Add a note on eukaryotic cell cycle. Describe the role of various eukaryotic DNA polymerases. Describe DNA repair mechanisms with disorders. (3+2+2+3).

2. Draw oxygen dissociation curve and explain right & left shift of ODC with factors affecting it. Describe molecular defect, reason for sickle-shaped RBCs, clinical features, diagnosis and management of sickle cell disease
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3. Describe the complete degradation of Heme. Describe various types of Jaundice, causes, clinical features and the biochemical parameters used for their diagnosis.

Q.3 Short Answer Questions (10 out of 11) **10x2=20**

1) Draw well labeled diagram of induction and repression of Lac-operon
2) Why does albumin level decrease in cirrhosis of the liver and nephrotic syndrome?
3) Write deficiency disorders of any four water-soluble vitamins with at least three clinical features each.
4) Define Isoenzymes. Give clinical significance of isoenzymes of LDH
5) What are tumor markers? Give 2 examples
6) Glutathione is important for maintaining RBCs membrane integrity
7) Sickle Hb tends to polymerize in deoxygenated state.
8) Genetic code is universal with few exceptions.
9) Discuss role of acute phase proteins in health and disease.
10) Effect of pH, pCO2, 2-3-BPG & temperature on ODC curve.
11) Telomerase are involved in aging process. Justify

Section C

Q.4 Short Answer Questions (4 out of 5) **4x5=20**

1) Describe competitive, non-competitive, and uncompetitive enzyme inhibition with clinical significance. (2+1.5+1.5)
2) Describe steps and clinical applications of DNA recombinant technology (3+2)
3) Describe post-translational modifications with examples
4) Enumerate cardiac biomarkers in the order of their earliest rise in myocardial infarction. Describe cardiac biomarkers that are not enzymes

5) write note on Genetic code

Q.5 **Clinical Cases (2 out of 2)** **2x10=20**

Case-1

A 5-year-old vegetarian boy was brought to pediatric OPD by his mother with the complains of unable to see at night, growth retardation and irritability. On examination his weight is less than his chronological age. There are greyish white spots on lateral sides of both corneas. The patient was diagnosed having Vitamin A deficiency.

Questions:

Q-1 Name the ocular signs and symptoms of vitamin A deficiency according to sequence of their appearance.

Q-2 Draw Wald's visual cycle.

Q-3 Why obstructive jaundice patients may develop night blindness?

Q-4 Write functions & mechanism of action of retinoic acid.

Q-5 Write dietary advice to this patient to correct vitamin A deficiency.

Case-2

A 70 years old man presented with back pain, loss of weight and breathlessness. On examination, he was anemic. Investigations showed: Hb 8gm/dl, total proteins 10.5 gm/dl, albumin 2.5 gm/dl, urea 50 mg/dl, and creatinine 2.3mg/dl. Serum protein electrophoresis showed M band in γ region. In urine, Bence Jones proteins were present. Radiological examination showed punched out lytic lesions in lumbar vertebrae, ribs & pelvis. Diagnosis of Multiple Myeloma was made.

1. What is the principle of electrophoresis?
2. What is the normal pattern of serum proteins in electrophoresis?
3. Calculate A/G ratio in this patient. Name various other conditions which alter A/G ratio.
4. What are Bence Jones proteins? How are they detected in urine?
5. Enumerate the functions of immunoglobulin.

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