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MANIPAL UNIVERSITY
MELAKA MANIPAL MEDICAL COLLEGE (MANIPAL CAMPUS)
MBBS PHASE – I STAGE – I DEGREE EXAMINATION – SEPTEMBER 2017
SUBJECT: BIOCHEMISTRY – PAPER - I (ESSAY)

Thursday, September 07, 2017

Time : 2.00 pm - 4.00 pm

Max. marks : 60

- ✓ **Answer all the questions**
- ✓ **Write the question number clearly in the margin**
- ✓ **Draw diagrams wherever appropriate**

1. Justify the following statements with biochemical basis:
 - 1A. Mediterranean diet is good for maintaining cardiovascular health.
 - 1B. Wheat chapathi is combined with kidney beans for a balanced diet.

(4+3 = 7 marks)

2. Give a diagrammatic representation of the process of biosynthesis of mature collagen emphasizing the reactions involved.

(7 marks)

3. Explain the effect of insulin on pathways of carbohydrate metabolism mentioning the key enzymes involved.

(5 marks)

4. Give the biochemical basis for the following:
 - 4A. Cholera toxin causes diarrhea.
 - 4B. Fatty liver is seen in chronic alcoholics.

(3+3 = 6 marks)

5. Define the term anion gap, give its normal value and mention its diagnostic utility in acid-base disorders.

(4 marks)

6. Write the reactions involved in the conversion of phenylalanine to catecholamines.

(5 marks)

7. A 49-year-old woman, came to the hospital with complaints of loss of appetite, fatigue and weakness. She complained about the occasional pain in the upper right quadrant of her abdomen, accompanied by nausea and vomiting. On physical examination, she appeared pale, had yellowish discoloration of sclera and her liver was tender and enlarged. Laboratory investigations revealed the following results:

Serum total bilirubin: 10mg/dL

Conjugated: 5.5mg/dL

Unconjugated: 4.5mg/dL

Serum ALP: 100 U/L

Serum AST: 530 U/L

Serum ALT: 620 U/L

Bile salts & pigments in urine: Present

7A. What is your diagnosis? Justify your answer.

7B. Explain why bile salts and pigments are present in the urine.

(3+1 = 4 marks)

8. Explain with a schematic representation, the chemiosmotic hypothesis for oxidative phosphorylation.

(3 marks)

9. Write the reactions catalysed by the regulatory enzymes of glycolysis.

(3 marks)

10. Illustrate the metabolism of lipoprotein that transports dietary lipids. Give ONE disorder each with its corresponding defect, in which its blood level is increased and decreased.

(6 marks)

11. Explain the effect of the substrate concentration on enzyme catalyzed reaction with a suitable graph. Add a note on significance of K_m .

(5 marks)

12. A 40 year old male reported to the hospital with acute pain in his left metatarsal joint. On examination, it was found to be swollen and reddish. His serum uric acid level was 11.5 mg/dl and microscopic examination of the fluid drawn from the affected joint contained needle shaped crystals. He was given symptomatic treatment and prescribed allopurinol on recurrence of the above symptoms.

12A. What is your diagnosis?

12B. Classify the above disorder with examples and biochemical basis.

($\frac{1}{2} + 4\frac{1}{2} = 5$ marks)

