

MANIPAL ACADEMY OF HIGHER EDUCATION
FIRST MBBS DEGREE EXAMINATION – AUGUST/SEPTEMBER 2021
SUBJECT: BIOCHEMISTRY– PAPER I (ESSAY)

Monday, August 30, 2021

Time: 10:20 – 13:00 Hrs.

Maximum Marks: 80

✍ **Answer ALL the questions.**

1. Describe the pathway of aerobic glycolysis. Discuss its energetics. Add a note on Rappaport Leubering shunt.

(6+2+2 = 10 marks)

2. A 4- month old female infant was admitted to the hospital for vomiting. Her mother also gave history of refusal to feeds, lethargy and irritability in the baby since 1 week. Biochemical investigations revealed very high plasma ammonia levels.

2A. What is the probable disorder?

2B. What is the biochemical defect?

2C. Name the transport form of ammonia.

2D. Describe the urea cycle.

2E. Add a note on the regulation of urea cycle.

(1+1+1+5+2 = 10 marks)

3A. Write any **FOUR** clinical applications of radioisotopes.

(4 marks)

3B. Write briefly on the significance of:

i) Polyol pathway. ii) Uronic acid pathway

(4 marks)

3C. Explain the process of digestion of dietary lipids.

(4 marks)

3D. i) Give one example for each of the following:

a) Derived lipid b) Phospholipid c) Essential fatty acid

d) Bile acid

ii) List the important products formed from cholesterol.

(4 marks)

3E. Write **FOUR** reactions of tyrosine metabolism leading to formation of biochemically significant products.

(4 marks)

3F. Write the reactions of β - oxidation of palmitic acid.

(4 marks)

3G. Write briefly on isoenzymes. Enumerate the isoenzymes of diagnostic significance in myocardial infarction.

(4 marks)

3H. What are lipoproteins? Discuss the LDL metabolism with a neat diagram.

(4 marks)

3I. Discuss transamination reaction with an example. What is its significance?

(4 marks)

3J. Define K_m . Explain the effect of substrate and enzyme concentrations on enzyme activity.

(4 marks)

3K. A 38-year old business man presented to out-patient department with a non-healing wound in the right foot. He also complained of frequent urination and excessive thirst and weight loss of one-month duration.

i) What is your impression?

ii) List the important biochemical investigations requested in this condition.

iii) Enumerate the functions of insulin.

(1+1+2 = 4 marks)

3L. Describe the complexes of electron transport chain. Explain the action of inhibitors with an example.

(4 marks)

3M. Write briefly on serum protein electrophoresis. Mention TWO applications.

(4 marks)

3N. Indicate the biochemical defect in following disorders.

i) Refsum's disease

ii) Niemann Pick disease

iii) MSUD

iv) Alkaptonuria

(4 marks)

3O. Give reasons.

i) Statins are used in treatment of hypercholesterolemia.

ii) Hyperuricemia is seen in von Gierke's disease.

iii) Glucokinase acts on glucose only.

iv) Sulphonamides are used as antibiotics.

(4 marks)



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FIRST MBBS DEGREE EXAMINATION – AUGUST/SEPTEMBER 2021

SUBJECT: BIOCHEMISTRY- PAPER II (ESSAY)

Wednesday, September 01, 2021

Time: 10:20 – 13:00 Hrs.

Maximum Marks: 80

☞ Answer ALL the questions.

1. A newborn baby presented with yellowish discoloration of skin and conjunctiva after 3 days of birth. The neonatologist advised phototherapy after which the child became normal.

1A. Name the clinical condition

1B. What is the normal serum bilirubin level? How is it estimated?

1C. Describe the fate of bilirubin

1D. Write a note on Crigler najjar syndrome

(1+2+5+2 = 10 marks)

2. Describe the process of translation. Name four inhibitors of translation and describe their mode of action.

(6+4 = 10 marks)

3A. Explain how haemoglobin acts as a buffer

(4 marks)

3B. Define BMR. What are the factors influencing BMR?

(1+3 = 4 marks)

3C. Write four mechanisms involved in the activation of protooncogene to oncogene

(4 marks)

3D. Name the water soluble vitamin required as coenzyme for each of the following enzymes indicating the reactions catalysed by them

i) Acetyl CoA carboxylase

ii) Acyl CoA dehydrogenase

iii) Thiolasase

iv) Thymidylate synthetase

(4 marks)

3E. Give two functions each for:

i) Selenium ii) Magnesium

(2+2 = 4 marks)

3F. Enumerate FOUR applications of recombinant DNA technology

(4 marks)

3G. i) Write the Henderson-Hasselbalch equation. What is its significance?

ii) Give a brief account of the causes of metabolic acidosis

(2+2 = 4 marks)

3H. Classify mutation giving suitable examples

(4 marks)

- 3I. Discuss the causes and clinical features of:
 i) Scurvy ii) Pellagra
 (2+2 = 4 marks)
- 3J. The blood picture of an undernourished strict vegetarian, who had undergone ileal resection showed macrocytic anaemia. Which vitamin deficiency could have lead to this condition? Name the coenzymes of this vitamin and give 2 metabolic reactions in which they participate
 (1+3 = 4 marks)
- 3K. Mention the mineral deficiency/excess causing the following:
 i) Goitre ii) Tetany iii) Flourosis iv) Menke's disease
 (4 marks)
- 3L. Discuss the purine salvage pathways
 (4 marks)
- 3M. Give reasons:
 i) Cobalt promotes erythropoiesis
 ii) Cystinosis can lead to renal impairment
 iii) Oedema is a salient feature in Kwashiorkor
 iv) Antisense therapy is used in cancer treatment
 (4 marks)
- 3N. i) Give one mechanism for the action of each of the following:
 a) Anticancer drug b) Antiretroviral drug
 ii) Discuss the supplementary action of proteins
 (2+2 = 4 marks)
- 3O. i) Explain the role of cytochrome P₄₅₀ in detoxification
 ii) Write briefly on acute intermittent porphyria
 (2+2 = 4 marks)

