

**MANIPAL ACADEMY OF HIGHER EDUCATION**  
**FIRST MBBS DEGREE EXAMINATION – AUGUST 2018**  
**SUBJECT: BIOCHEMISTRY– PAPER I (ESSAY)**

Thursday, August 16, 2018

Time: 10:20 – 13:00 Hrs.

Maximum Marks: 80

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**✍ Answer ALL the questions.**

1. Describe TCA cycle under the following headings:

- 1A. Reactions
- 1B. Energetics
- 1C. Anaplerosis

(6+2+2 = 10 marks)

2. A two-week old baby was brought to pediatric OPD with a complaint that the diapers used for the baby had black discoloration. The pediatrician explained to the parents that it was due to an inborn error.

- 2A. Name the disorder and the biochemical defect.
- 2B. Name the product accumulated in this disorder.
- 2C. Mention ONE biochemical test used to confirm this disorder.
- 2D. Discuss the metabolism of tyrosine.
- 2E. List the biologically significant products formed from tyrosine.

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

3A. What are radioisotopes? Mention its THREE diagnostic and THREE therapeutic uses.

3B. What are mucopolysaccharides? Give THREE examples and function of each.

3C. Write a short note on the significance of HMP shunt pathway.

3D. Write briefly on prostaglandins.

3E. What are lipoproteins? Discuss the HDL metabolism with a neat diagram.

3F. Write the reactions that lead to the formation of biochemically important products from glycine metabolism.

3G. List the causes of fatty liver.

3H. Mention any FOUR enzymes of diagnostic significance and indicate their use.

3I. Discuss transmethylation reaction with TWO examples.

3J. Define enzyme specificity. What is the effect of substrate and enzyme concentrations on enzyme activity?

- 3K. An 18-year-old boy was brought to casualty with hyperventilation. On examination, he was dehydrated. His random blood glucose was 400mg/dL, and urine tested positive for ketone bodies.
- i) What is your probable diagnosis?
  - ii) Name the ketone bodies.
  - iii) How are the ketone bodies utilized?
- 3L. Describe the complexes of electron transport chain. Explain the action of uncouplers with an example.
- 3M. Write briefly on ELISA. What are its applications?
- 3N. Indicate the defect in following disorders:
- i) Gaucher's disease
  - ii) Tay Sach's disease
  - iii) Hartnup's disease
  - iv) MSUD
- 3O. Give reasons:
- i) Bile acid deficiency can lead to cholelithiasis.
  - ii) Cataract is seen in galactosemia.
  - iii) Ethanol can be used to treat methanol poisoning.
  - iv) Methotrexate is used as an anticancer drug.

(4 marks × 15 = 60 marks)



**MANIPAL ACADEMY OF HIGHER EDUCATION**  
**FIRST MBBS DEGREE EXAMINATION – AUGUST 2018**  
**SUBJECT: BIOCHEMISTRY– PAPER II (ESSAY)**

Friday, August 17, 2018

Time: 10:20 – 13:00 Hrs.

Maximum Marks: 80

✍ **Answer ALL the questions.**

1. Describe the process of transcription with the help of diagrams. Add a note on post transcriptional modifications. Mention the inhibitors of transcription.

(6+3+1 = 10 marks)

2. The biochemical investigations in a patient with jaundice are as follows:

Total bilirubin-12 mg/dl, Direct bilirubin- 0.9mg/dl, AST- 10U/L, ALT-40 U/L, ALP- 80U/L

- 2A. Indicate the type of jaundice.  
2B. List the causes of this type of jaundice.  
2C. How is bilirubin formed, transported and excreted?  
2D. Discuss van den Bergh's test.

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

- 3A. Outline the major steps involved in recombinant DNA technique.

(4 marks)

- 3B. What is the normal plasma pH? Explain the role of kidney in its regulation.

(4 marks)

- 3C. **Write short notes on:**

- i) Hyperuricemia  
ii) Respiratory acidosis

(2+2 = 4 marks)

- 3D. Name the biochemical defect in the following:

- i) Lesch Nyhan syndrome  
ii) Crigler Najjar syndrome  
iii) Xeroderma pigmentosum  
iv) Porphyria cutanea tarda

(4 marks)

- 3E. Discuss briefly the steps and applications of polymerase chain reaction.

(3+1 = 4 marks)

- 3F. Describe the deficiency manifestations of vitamin A

(4 marks)



3G. Indicate the normal values and clinical significance of:

- i) Serum calcium
- ii) Serum potassium

(2+2 = 4 marks)

3H. Explain the biochemical basis of the following:

- i) Megaloblastic anemia is a common feature of folic acid and vitamin B<sub>12</sub> deficiencies.
- ii) 5 Fluoro uracil is used as an anticancer agent.
- iii) Puromycin cannot be used as antibiotic in humans.
- iv) Anion gap is increased in patients with diabetic ketoacidosis.

(4 marks)

3I. Write short notes on protein energy malnutrition (PEM).

(4 marks)

3J. How are the following compounds detoxified in the body?

- i) Benzoic acid
- ii) Atropine
- iii) Picric acid
- iv) Acetyl salicylic acid

(4 marks)

3K. Write briefly on tumour markers.

(4 marks)

3L. Describe the formation of calcitriol.

(4 marks)

3M. Enumerate the functions of the following:

- i) Zinc
- ii) Pantothenic acid

(2 + 2 = 4 marks)

3N. A girl aged 7 years was brought to the clinic with complaints of bleeding gums, delayed wound healing and recurrent upper respiratory tract infections.

- i) What is the probable vitamin deficiency the girl is suffering from?
- ii) Mention the sources & RDA of this vitamin.
- iii) Enumerate its functions.

(1+1+2 = 4 marks)

3O. Write briefly on:

- i) Dietary fiber
- ii) Specific dynamic action

(2+2 = 4 marks)

