Batch 40 - March 2018

Reg. No.										

MANIPAL ACADEMY OF HIGHER EDUCATION

MELAKA MANIPAL MEDICAL COLLEGE (MANIPAL CAMPUS)

MBBS PHASE – I STAGE – I DEGREE EXAMINATION – MARCH 2018

SUBJECT: BIOCHEMISTRY - PAPER – I (ESSAY)

Thursday, March 08, 2018

Time : 2.00 p.m. – 4.00 p.m. Max. Marks : 60

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

1. Explain the Wald's visual cycle. List the ocular symptoms of vitamin A deficiency

(5 marks)

2. Write the Henderson-Hasselbalch equation for bicarbonate buffer. Give a diagrammatic representation of the process of bicarbonate reclamation in kidneys

(4 marks)

3. Describe with suitable graphs, the effect of pH and temperature on enzyme activity

(5 marks)

4. Angel, a 24-month-old girl from rural sub-Saharan Africa presents with reduced appetite for past 10 days. She was weaned off the breast feeds two months earlier. On examination, she is found to have pitting edema of the feet bilaterally, hyper-pigmented patches in the skin and investigations showed fatty liver.

   4A. What is your likely diagnosis?

   4B. Give biochemical basis for edema and fatty liver seen in Angel

(0.5 + 3.5 = 4 marks)

5. Illustrate the steps of absorption of lipids in small intestine

(4 marks)

6. Outline the steps of gluconeogenesis from glycerol

(5 marks)

7. Write the reaction catalyzed by the defective enzyme in the following disorders:
   7A. Crigler-Najjar syndrome
   7B. Von Gierke's disease

(1+1 = 2 marks)

8. Explain the biochemical basis for hyperglycemia, polyphagia, polydipsia and polyuria in diabetes mellitus patients

(5 marks)

9. Give a diagrammatic representation of the mechanism of action of steroid hormones

(3 marks)

10. Discuss vitamin D metabolism under the following headings:
   10A. Synthesis of calcitriol
   10B. Actions of calcitriol in calcium homeostasis
   10C. Name the associated deficiency disorders

(3+3+1 = 7 marks)

11. Describe initiation of replication in prokaryotes with the help of diagrams

(4 marks)

12. Justify the following statements with biochemical reasons:
   12A. Glucose metabolism in RBCs protects them against oxidative damage
   12B. Lactate is the end product of glycolysis in RBCs

(3+3 = 6 marks)

13. Forty five year old Ramesh came to a physician for a general health check-up. On blood investigations, his fasting lipid profile values were as follows:
   Triglycerides: 350 mg/dl
   Total cholesterol: 300 mg/dl
   HDL cholesterol: 50 mg/dl
   13A. Calculate the serum LDL cholesterol levels of Ramesh using Friedwald's formula
   13B. Name ONE drug used to reduce his cholesterol levels, explaining its mechanism of action
   13C. Mention TWO lifestyle modifications (with biochemical basis) that are helpful in hypercholesterolemia

(2+2+2 = 6 marks)