Reg. No.										

MANIPAL UNIVERSITY

FIRST MBBS DEGREE EXAMINATION – SEPTEMBER 2016

SUBJECT: BIOCHEMISTRY– PAPER I (ESSAY)

Friday, September 16, 2016

Time: 10:20 – 13:00 Hrs. Maximum Marks: 80

✍ **Answer ALL the questions.**

✍ **Long answer questions:**

1A. A 50 year old non diabetic business executive developed profuse sweating with chest pain and fainted during a meeting. He was rushed to a nearby hospital where his BP was found to be 90/50 mmHg.

i) What is your probable diagnosis?

ii) What laboratory tests would you order to clinch your diagnosis?

1B. Explain the effect of pH on enzyme activity.

1C. Define Km. Give its significance.

((1+2)+3+4 = 10 marks)

2. **Explain the metabolism of ammonia under the following heads:**

2A. Formation

2B. Transport

2C. Detoxification

2D. Associated disorders

(3+1+4+2 = 10 marks)

3. **Short answer questions:**

3A. Explain the digestion of dietary carbohydrates in the GIT.

(4 marks)

3B. Draw a neat labeled diagram of the carnitine shuttle.

(4 marks)

3C. A child was brought to the OPD with complaints of vomiting after every feed. The mother also gave a history of diarrhea and weight loss for the past few months. On examination the child was found to have jaundice and cataract. Urine gave positive Benedict's test. Glucose oxidase test was negative.

i) What is your diagnosis?

ii) What is the biochemical defect?

iii) What is the cause for jaundice and cataract?

(1+1+2 = 4 marks)

3D. Trace the pathway for synthesis of catecholamines.

(4 marks)

3E. Explain the chemiosmotic hypothesis.

(4 marks)

3F. What is the normal serum cholesterol level? Name three pathological conditions where it is increased.

(1+3 = 4 marks)

3G. Define gluconeogenesis. Name the key gluconeogenic enzymes.

(1+3 = 4 marks)

3H. Explain the metabolism of HDL with a neat diagram.

(4 marks)

3I. Classify immunoglobulins. Write the subunit composition of each type.

(1+3 = 4 marks)

3J. Write briefly on secondary structure of proteins.

(4 marks)

3K. **Write short notes on:**

i) Transamination ii) Uncouplers

(2+2 = 4 marks)

3L. **Explain with examples:**

i) Epimerism ii) Anomerism

(2+2 = 4 marks)

3M. Enumerate the clinical uses of prostaglandins.

(4 marks)

3N. Give the biochemical defect and symptoms in the following disorders:

i) von Gierke's disease ii) Niemann Pick's disease

(2+2 = 4 marks)

3O. **Give reasons for the following:**

i) Glycosuria can be seen in patients with normal blood glucose level

ii) L – DOPA is used for treatment of Parkinson's disease

iii) Proteolytic enzymes are secreted as zymogens

iv) Malate – aspartate shuttle is more efficient than glycerophosphate shuttle

(4 marks)

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FIRST MBBS DEGREE EXAMINATION – SEPTEMBER 2016

SUBJECT: BIOCHEMISTRY– PAPER II (ESSAY)

Saturday, September 17, 2016

Time: 10:20 – 13:00 Hrs. Maximum Marks: 80

✍ **Answer ALL the questions.**

✍ **Long answer questions.**

1. A 22 year old adult male was admitted to the hospital with the complaints of fever, abdominal pain and vomiting. Physical examination of the patient revealed yellowish discoloration of the sclera which is suggestive of jaundice.

1A. Describe the formation, transport and disposal of bilirubin.

1B. Explain the use of biochemical tests in differentiating the types of jaundice.

((2+1+3)+4 = 10 marks)

2A. Explain the process of DNA replication with labeled diagrams.

2B. Outline the steps involved in polymerase chain reaction (PCR) and add a note on its applications.

(6+(3+1) = 10 marks)

3. **Short answer questions:**

3A. Describe the structure of transfer RNA with the help of a diagram.

(4 marks)

3B. Write briefly on types and consequences of mutation.

(2+2 = 4 marks)

3C. Explain the following:

i) Reverse transcription ii) Two inhibitors of protein biosynthesis

(2+2 = 4 marks)

3D. Explain regulation of gene expression in prokaryotes using Lac-operon as a model.

(4 marks)

3E. Write the detoxification of the following compounds.

i) Phenobarbital ii) Aspirin iii) Ethanol iv) Benzoyl CoA

(1 mark ×4 = 4 marks)

3F. Give the biochemical basis for the following statements:

i) Egg albumin is considered as a reference protein

ii) Prothrombin time is prolonged in chronic biliary obstruction

(2+2 = 4 marks)

3G. Describe the role of kidneys in the excretion of acids.

(4 marks)

3H. Discuss the following:

i) Erythropoetic protoporphyria ii) Wald's visual cycle

(2+2 = 4 marks)

3I. Write two reactions each catalyzed by the coenzymes of the following vitamins:

i) Niacin ii) Riboflavin

(2+2 = 4 marks)

3J. Explain the following:

i) Vitamin B_{12} deficiency and folate trap

ii) Anion gap in metabolic acidosis

(2+2 = 4 marks)

3K. Give biochemical explanations for the following statements:

i) Spongy, bleeding gums are common symptoms of scurvy

ii) Methotrexate is used as an anticancer drug

(2+2 = 4 marks)

3L. Describe the regulation of serum calcium levels.

(4 marks)

3M. Describe the iron absorption in the GIT. Add a note on its storage.

(2+2 = 4 marks)

3N. i) Describe the etiology and clinical features of Kwashiorkor.

ii) Define creatinine clearance and explain its clinical utility.

(2+2 = 4 marks)

3O. A 51 yr old bank manager with body weight of 90kg consumed 500g of carbohydrate (mainly rice), 100g protein and 100g fat each day

i) Calculate the total calories consumed by him per day

ii) Which are the factors to be considered while calculating the daily total energy requirement of an individual?

(2+2 = 4 marks)