Reg. No.										

MANIPAL UNIVERSITY

FIRST MBBS DEGREE EXAMINATION – JUNE/JULY 2015

SUBJECT: BIOCHEMISTRY– PAPER I (ESSAY)

Thursday, July 02, 2015

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

✍ **Answer ALL the questions.**

1. A three week old infant was brought to pediatric OPD with complaints of excessive crying, refusal to feeds and lethargy. The mother also gave history of mousy odour of the urine and laboratory tests revealed phenylketonuria.

1A. What is the biochemical defect?
1B. What are the products accumulated and excreted in urine?
1C. Discuss the metabolism of phenylalanine.
1D. Add a note on the biochemically significant products formed in the metabolism of phenylanine

(1+1+5+3 = 10 marks)

2. Illustrate the Kreb's cycle. Justify the anaplerotic and amphibolic role of the cycle with TWO examples each.

(6+2+2 = 10 marks)

3A. Classify lipoproteins and write their functions.

(4 marks)

3B. Describe competitive enzyme inhibition with TWO clinical applications.

(4 marks)

3C. Name the enzyme defect associated with:

i) Tay Sach's disease ii) von Gierke's disease
iii) Hereditary fructose intolerance iv) Albinism

(1 mark × 4 = 4 marks)

3D. Write the components of the ETC in sequence indicating the ATP generating sites.

(3+1 = 4 marks)

3E. Give ONE significance of:

i) BAL ii) CK-MB
iii) Glucuronic acid iv) GSH

(1 mark × 4 = 4 marks)

3F. Classify amino acids based on their chemical properties.

(4 marks)

3G. Write the steps of ketogenesis. Add a note on Ketosis.

(3+1 = 4 marks)

3H. Give the normal serum/plasma values of:

i) Postprandial glucose ii) Urea
iii) Cholesterol iv) Glycated haemoglobin

(1 mark × 4 = 4 marks)

3I. Discuss enzyme specificity with suitable examples.

(4 marks)

3J. Explain the significance of:

i) Galactose ii) Ribose

(2 marks × 2 = 4 marks)

3K. An obese male with high triglycerides was also found to have hepatomegaly. What is your probable diagnosis? Discuss the other causes for this condition and name the factors that help prevent it.

(1+2+1 = 4 marks)

3L. Discuss the metabolism of methionine.

(4 marks)

3M. Explain the steps of β –oxidation of palmitic acid in mitochondria with a note on its energetics.

(3+1 = 4 marks)

3N. **Write briefly on:**

i) Acute phase proteins
ii) Use of radioisotopes in medicine

(2 marks × 2 = 4 marks)

3O. Give biochemical reasons for the following:

i) PUFAs can prevent atherosclerosis
ii) When heated, proteins lose their biological activity
iii) The ETC is located in the inner mitochondrial membrane
iv) Deficiency of glucose-6-phosphate dehydrogenase can lead to haemolysis

(1 mark × 4 = 4 marks)

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MANIPAL UNIVERSITY

FIRST MBBS DEGREE EXAMINATION – JUNE/JULY 2015

SUBJECT: BIOCHEMISTRY– PAPER II (ESSAY)

Friday, July 03, 2015

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

✍ **Answer ALL the questions.**

✍ **Long answer questions.**

1. A 48 year old male patient presented with symptoms of yellowish discoloration of skin, sclera. After the clinical investigations and ultrasonography he was found to have carcinoma of head of the pancreas. His biochemistry laboratory report showed the following:
Total bilirubin level: 20 mg/dl, conjugated bilirubin: 18mg/dl, Alkaline phosphatase (ALP):100 KAU/dl
(Normal level: 3-13 KAU units/dl), Alanine transaminase (ALT): 55 IU/l (Normal level: 5-40IU/l)

Answer the following questions:

1A. Diagnose the type of jaundice. Explain biochemical basis for diagnosis
1B. Explain the formation and metabolism of bilirubin
1C. What happens to prothrombin time in this patient and why?

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

2. With the help of diagrams explain translation under the following aspects:
2A. Activation of amino acids
2B. Initiation
2C. Elongation
2D. Termination

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

3. **Short answer questions:**

3A. Explain the formation of active vitamin D from its provitamin form. Add a note on its role in serum calcium homeostasis

(2+2 = 4 marks)

3B. Describe recombinant DNA technology with the help of diagrams. Write two applications.

(3+1 = 4 marks)

3C. Write notes on:
i) HbS ii) Westernblot technique

(2+2 = 4 marks)

3D. Write **one** coenzyme reaction catalyzed by and deficiency manifestations of each of the following vitamins:

i) Vitamin C ii) Niacin

(2+2 = 4 marks)

3E. Enumerate the steps of heme biosynthesis indicating enzymes and coenzymes.

(4 marks)

3F. Write on the causes and alterations in the acid base parameters in respiratory acidosis.

(2+2 = 4 marks)

3G. Write the formation of PRPP (5-phosphoribosyl pyrophosphate). Add a note on purine salvage.

(1+3 = 4 marks)

3H. Explain the absorption of iron. What are the causes of iron deficiency anemia?

(2+2 = 4 marks)

3I. A 55 year old, 80Kg weighing male corporate executive had his daily dietary intake of 535 gm carbohydrate, 140 gm protein, 100 gm fat everyday and 50gm alcohol

i) Calculate his caloric intake per day

ii) What dietary advise would you recommend regarding his diet composition?

iii) Define balanced diet

(1+2+1 = 4 marks)

3J. Write notes on:

i) RFLP ii) Tumor markers

(2+2 = 4 marks)

3K. Write notes on protein energy malnutrition disorders

(4 marks)

3L. Explain:

i) Causes and deficiency manifestations of vitamin B_{12}

ii) Anion gap

(2+2 = 4 marks)

3M. Describe Wald's visual cycle. List **two** ocular manifestations observed in vitamin A deficiency

(3+1 = 4 marks)

3N. Write notes on:

i) Creatinine clearance test ii) Biochemical significance of copper

(2+2 = 4 marks)

3O. Give biochemical basis for the following:

i) Folate deficiency causes megaloblastic anemia

ii) 61 tRNA's need not be there to recognize 61 codons during translation

iii) B_{12} deficiency results in neurological symptoms

iv) Genetic code is described as degenerate and unambiguous

(1 mark × 4 = 4 marks)