Reg. No.										

MANIPAL UNIVERSITY

FIRST MBBS DEGREE EXAMINATION – MAY/ JUNE 2012

SUBJECT: BIOCHEMISTRY– PAPER I (ESSAY)

Monday, June 04, 2012

Time: 10:20 – 13:00 Hrs. Maximum Marks: 40

1. Long answer questions:

1A. Describe the process of β-oxidation of fatty acids. Add a note on the energetics.

(5+1 = 6 marks)

1B. Discuss the metabolism of glycine under the following headings:

i) Synthesis ii) Catabolism iii) Specialized compounds formed

(1+1+4 = 6 marks)

2. Short answer questions:

2A. Describe briefly the hormonal regulation of blood glucose level.

(4 marks)

2B. Write in detail the four key reactions of gluconeogenesis pathway.

(4 marks)

2C. Briefly explain the following:

i) Active site of an enzyme ii) Effect of pH on enzyme catalyzed reactions

(2+2 = 4 marks)

3. Brief answers questions:

3A. Describe the clinical significance of the following plasma proteins:

i) Albumin ii) Ceruloplasmin iii) α-1-antitrypsin

(1×3 = 3 marks)

3B. Give the diagnostic importance of the following enzymes:

i) Creatine kinase ii) Amylase iii) Alanine transaminase

(1×3 = 3 marks)

3C. Mr. Sudeep, a 54 year old senior Bank executive was reviewed by his physician and was found to have several of the major risk factors for coronary heart disease.

His blood lipid levels were as follows:

Serum total cholesterol - 314 mg/dl (desired level is 200 mg/dL or less)

Serum triglycerides - 295 mg/dl (desired level is 150 mg/dL or less)

Serum HDL-cholesterol - 24 mg/dl (desired level is ≥ 40 mg/dL)

i) Mr. Sudeep is having which type of hyperlipoproteinemia?

ii) Calculate LDL-cholesterol level of Mr. Sudeep.

iii) What dietary and lifestyle changes you will advise to Mr. Sudeep to improve his overall health status?

(1+1+1 = 3 marks)

3D. Give an outline of the electron transport chain indicating ATP generating sites.

(3 marks)

4. Give biochemical basis of the following:

4A. Chronic alcoholics tend to have high plasma VLDL levels.

4B. Altered CNS bahaviour in patients with advanced liver disease.

4C. Ethanol is administered in patients with methanol poisoning.

4D. Oxidation of $FADH_2$ in ETC yields 2 ATP.

(1×4 = 4 marks)

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MANIPAL UNIVERSITY

FIRST MBBS DEGREE EXAMINATION – MAY/ JUNE 2012

SUBJECT: BIOCHEMISTRY– PAPER II (ESSAY)

Tuesday, June 05, 2012

Time: 10:20 – 13:00 Hrs. Maximum Marks: 40

1. Long answer questions:

1A. A 15 year old boy complained of swelling and pain in the distal phalangeal joints. Blood investigations showed the following results:

Fasting blood glucose : 75 mg%
Blood urea : 15 mg%
Blood uric acid : 60 mg%

On diagnosing the pathology, the physician decided to treat patient with allopurinol.

i) What is your probable diagnosis in the above patient?
ii) What other blood investigations would you suggest?
iii) Comment on the serum uric acid level and explain the cause of pain in joints.
iv) What is the biochemical explanation for the treatment given in the above patient?

(1+1+2+2 = 6 marks)

1B. A 6-year old boy was taken to the hospital by his mother with complaints of decreased vision in the night. The doctor suspected a possible nutrient deficiency. Describe in detail the sources, RDA, functions and deficiency manifestations of the deficient nutrient

(1+1+ 4 = 6 marks)

2. Short answer questions:

2A. Explain the metabolism of iron in the body.
2B. Give an account of post transcriptional modifications.
2C. Write the reactions of heme synthesis in body.

(4×3 = 12 marks)

3. Brief answers questions:

3A. Describe PCR with diagrams and list TWO uses of it.

Compare and contrast (1 similarity and 2 differences each) the following:

3B. DNA polymerase and RNA polymerase.
3C. Prehepatic and post hepatic jaundice.
3D. Kwashiorkor and marasmus.

(3×4 = 12 marks)

4. Give biochemical reasons for the following:

4A. Azaserine is used as an anticancer agent.
4B. Administration of barbiturates is not advisable for the patients suffering from acute intermittent porphyria.
4C. Fluidity of membrane is contributed by phospholipids.
4D. Oxalates in diet inhibit absorption of iron and calcium.

(1×4 = 4 marks)