MUHS MBBS QUESTION PAPERS

BIOCHEMISTRY PART 2

Paper – 2

SUMMER 2014

(2 ½ hours) Total marks : 40

SECTION – B

2. Brief answer questions :(any 6 of 7) : (6x4=24)

a) Enumerate the different types of glycosaminoglycans and give their biomedical importance.

b) Explain the role of kidney in maintaining acid base balance.

c) A 45 year old male came with complain of frequent occurance of boils and ulcers which were not healing. On routine blood examination the blood sugar was found to be 'Fasting Blood Sugar – 250 mg / dl Urine glucose ++ He also gave a history of polyuria and polydipsia.

i) What is the probable diagnosis?

ii) What is the cause for polyuria and polydipsia?

iii) What are the biochemical changes in lipid & protein metabolism in this disease?

d) One month old female child was brought to the OPD with failure to thrive and bilateral opacities in the eye. On examination the child had bilateral cataract and showed increased galactose in blood.

i) What is the probable diagnosis?

ii) What is the cause?

iii) Explain the biochemical basis of cataract.

iv) What dietary advice should be given to the patient?

e) Detoxification by conjugation with suitable examples.

f) Name the different second messenger hormones and explain the role of cAMP as a second messenger.

g) Biochemical changes in most severe phase of starvation.

SECTION – C

3. Long answer question : (any 2 of 3) : (2x8=16)

a) Explain the absorption, regulation, functions, and deficiency manifestations of Iron.

b) Explain beta oxidation of palmitic acid with its regulation and energetics.

c) Describe hormonal regulation of blood glucose.

Paper – 2

MAY/JUNE 2013

(2 ½ hours) Total marks : 40

SECTION – B

2. Brief answer question :(any 6 of 7) : (6x4=24)

a) Creatinine clearance test.

b) Tumor markers.

c) Digestion and absorption of lipids.

d) Metabolism of cholesterol & its functions

e) 17 year old girl, a resident of hostel brought to hospital with complaits of nausea vomiting, and loss of appetite, on examination her eyes showed yellow coloration & urine was dark yellow. Liver was enlarged & tender. Laboratory findings showed Total bilirubin-5.5mg/dl. Conjugate bilirubin- 2.8mg/dl

i) Name the probable disorders.

ii) Which enzyme will be raised in the blood?

iii) Which abnormal pigment will be defected in urine?

f) 50 years old man admitted to the hospital in a confused and remiconscious state. Several days before admission he was complaining of undue thirst and also used to get up several times during the night for urination. His breath had furity odour. Following is the data of his laboratory investigations.

1) Blood glucose (random) 480 hm/dl

2) Rothera test on urine-purple ring.

3) Urine sugar-present (++++)

i) What is the probable diagnosis?

ii) Describe biochemical basis of the following condition.

a) Increased thirst and frequent urination.

b) Fruity odour to the breath.

g) Glycosaminoglycans.

SECTION – C

3. Long answer questions :(any 2 of 3) : (2x8=16)

a) What is the normal blood pH? How is it maintained? Write in brief disorders associated with acid-base balance.

b) Describe glycogenolysis. Explain its regulation and enumerate Glycogen storage diseases.

c) Write in detail about absorption transport, regulation, functions & deficiency manifestations of calcium.

Paper – 2

WINTER 2012

(2 ½ hours) Total marks : 40

SECTION – B

2. Brief answer questions : (any 6 of 7) : (6x4=24)

a) Significance of HMP shunt.

b) Describe any two buffer systems involved in maintenance of normal blood pH.

c) Oncogenes.

d) Explain the principle of chromatography and its applications.

e) Lipoproteins.

f) A person with untreated diabetes mellitus and acidosis was admitted to the hospital.

i) What is the type of acidosis?

ii) What is the normal bicarbonate Carbonic acid ratio?

iii) Explain the mechanism of compensation.

g) A 4-year old boy was brought to the hospital with complaints of nausea, vomiting, abdominal pain. He also had typical symptoms of hypoglycemia. It was told that child skipped of his routine means and ate sweets and fruits only. The mother informed the physician that he had similar complaints in the past also whenever he consumed large quantities of fruits and cane sugar.

h) The laboratory data showed that the child had a low blood glucose level (50 mg/dl) and his urine gave a positive test fructose. The oral glucose tolerance test for the child was absolute normal.

i) Name the condition.

ii) Which is the deficient enzyme and the reaction?

iii) What is the precaution to be taken in diet?

SECTION – C

3. Solve : (any 2 of 3) : (2x8=16)

a) Describe the starvation metabolism.

b) How water and electrolyte balance is maintained in the body?

c) Give role of various enzymes in liver function tests.

Paper – 2

WINTER 2011

(2 ½ hours) Total marks : 40

SECTION – B

2. Brief answer question : (any 6 of 7) : (6x4=24)

a) Classify phospholipids along with their examples and give one importance of each.

b) Explain the biochemical changes observed in starvation metabolism.

c) A 14 year old boy, resident of a boarding school was admitted to the hospital with vomiting and yellowish discoloration of skin and sclera. Routine urine

examination showed the presence of bile salts, bile pigments and urobilinogen was absent.

i) What is type of jaundice ?

ii) Which enzymes are done to confirm the diagnosis and state the normal range.

iii) What changes are expected to be seen in the serum bilirubin levels?

d) A person with untreated diabetes mellitus and acidosis was admitted to the hospital for treatment.

i) What is the type of acidosis?

ii) What is the normal bicarbonate carbonic acid ratio?

iii) How will compensation occur?

e) Mechanism of action of steroid hormones.

f) State the principle of flame photometer. Explain the different parts of instrument and give their importance.

g) Explain with examples how detoxification takes place by conjugation.

SECTION – C

3. Solve (any 2 of 3) : (2x8=16)

a) Explain how acetyl CoA is formed from pyruvate and how it is further metabolized in the TCA cycle. Explain the amphibolic nature of TCA cycle.

b) Mention the sources, RDA, absorption, biochemical functions and deficiency manifestations of iron.

c) Explain the pathway of beta-oxidation of palmitic acid and give its energetics.

Paper – 2

MAY/JUNE 2011

(2 ½ hours) Total marks : 40

SECTION – B

2. Brief answer questions : (any 6 of 7) **a)** Explain the mechanism of action of steroid hormones.

b) What are tumour markers? Give four examples.

c) Explain the Rapoport Luebering cycle. State its significance.

d) State the principles of chromatography. Mention the types and applications.

e) Metabolic acidosis and its compensation.

f) Enumerate the enzyme defects and clinical manifestations in any four of the glycogen storage diseases.

g) Fatty liver and lipotropic factors.

SECTION – C

3. Attempt .(any 2 of 3) : **(2x8=16)**

a) Describe the hexose monophosphate shunt, why is it called "multifunctional"?

b) Explain the synthesis of cholesterol How is it regulated?

c) Describe sources, biochemical functions, daily requirements and deficiency manifestations of calcium and phosphorous.

Paper – 2

NOV./DEC. 2010

(2 ½ hours) Total marks : 40

SECTION – B

2. Write short answers (any 6 of 7) : **(6x4=24)**

a) Metabolic changes in diabetes mellitus.

b) Essential fatty acids.

c) Describe the role of various buffers in the maintenance of blood pH.

d) Detoxification by conjugation.

e) Describe the role of second messengers in hormone action.

f) A 3 year old boy with mental retardation was found to have cataracts. Biochemical investigations showed 12 mg/dl. Of total serum bilirubin most of it being unconjugated type. The baby was put under ultra-violet light lamp. The serum bilirubin level returned to normal after 10 days.

1) What is the probable diagnosis?

2) What is the reason behind the transient increase in serum bilirubin?

3) What is the basis of ultra-violet light therapy?

4) What are the consequences if the serum bilirubin levels increase beyond 20 mg/dl?

3. Attempt (any 2 of 3) : **(2x8=16)**

a) Describe the metabolism of glycogen and its hormonal regulations.

b) Describe the beta-oxidation of fatty acids taking palmitic acids as an example and write an account of the energetics involved.

c) Describe the metabolism of copper and zinc and their deficiency diseases.

Paper – 2

MAY/JUNE 2010

(2 ½ hours) Total marks : 40

SECTION – B

2. Brief answer questions (any 6 of 7) **(6x4=24)**

a) Detoxication by conjugation.

b) Chemical carcinogens.

c) Creatinine clearance tests.

d) Significance of HMP shunt.

e) Role of calcium as second messengers.

f) A 13 year old boy reported with jaundice, fatigue, muscle stiffness, tremors and behavioural changes. Examination revealed an enlarged liver and spleen, Kayser-ring was noted.

i) What is the probable diagnosis?

ii) Which organ are affected?

iii) What are the causes for the disease?

iv) What is the treatment suggested?

g) A one year old child was reported with diarrhea, vomiting, jaundice, lethargy. Examination revealed hepatosplenomegaly and cataracts. His blood galactrose levels were raised.

i) What is the probable diagnosis?

ii) Which enzymes is deficient?

iii) Which abnormal metabolites are excreted in the urine?

iv) What is the cause of cataract?

SECTION – C

3. Solve (any 2 of 3): (2x8=16)

a) What is metabolic acidosis? Enumerate its causes and describe the various compensatory mechanisms operating in the body.

b) Describe the process of glycogrnolysis in the body and its regulation. Write briely about any three glycogen storage disease.

c) Describe the roles of low density lipoprotein (LDL) and high density lipoprotein (HDL) in cholesterol transport. Discuss their role in atherosclerosis.

Paper – 2

NOV./DEC. 2009

(2 ½ hours) Total marks : 40

SECTION – B

2. Brief answer questions :(Any 6 of 7) : (6x4=24)

a) Explain the mechanism of hydrophilic hormones.

b) Describe any two buffer systems involved in the maintenance of normal blood pH.

c) Proto-oncogenes and oncogenes.

d) State the principle of electrophoresis and its application.

e) Describe phase l reaction in the metabolism of xenobiotics.

f) A 26 year old man walked into the OPD with heavy sweating, loss of weight and palpitations. His thyroid gland was enlarged and he wascdiagnosed for hyperthyroidism.

1) What were the thyroid function tests carried out to reach this conclusion ? **02**

2) What are the reasons for the enlarged thyroid gland and loss of weight? **01**

3) Why does the patient complain constantly of feeling hot. **01**

g) An infant suffering with distension of abdomen, flatulence and watery diarrhea is brought to the OPD by this concerned mother. She is told that the child is lactose intolerance?

1) What is the enzyme deficient in this case?

2) What is the pobable cause of the distention of the abdomen and flatulence?

3) What would be the treatment suggested?

SECTION – C

3. Attempt : (any 2) : (2x8=16)

a) Describe the denovo synthesis of palmitic acid and its regulation.

b) Describe the dietary sources, biochemical roles absorption and disease manifestation of iron and iodine metabolism.

c) Describe glycogen metabolism and its regulation.

(2 ½ hours) Total marks : 40

SECTION – B – (SAQ)

2. Write short answers :(any 6 of 7) : (6x4=24)

a) Mechanism of steroid hormones.

b) Application of radioisotopes in medicine.

c) Different types of chromatography techniques.

d) Define detoxification and explain phase l reaction with examples.

e) Biochemical changes in starvation.

f) A forty year old woman admitted with recurrent pain in abdomen developed jaundice two days after admission. Ultrasonography revealed enlarged head of pancreas. A routine urine examination showed the presence of bile pigments, but urobilinogen was absent. Stool examination revealed chalky white coloured stools.

1) State the type of Jaundice.

2) What is the most likely cause?

3) Explain the findings in urine.

4) Which are the laboratory tests to be carried out in blood sample of the patient?

g) A 17 year old girl was admitted in hospital with coma. Several days before she complained of excessive thirst and polyuria. She was dehydrated, breathing was deep and breath had fruity odour.

1) Name the disease and mention its cause.

2) Which are the biochemical investigations to be carries out ?

3) Mention the major metabolic changes associated with this disease.

4) What is the suggestive mode of treatment?

SECTION – C

3. Answer (any 2) : (2x8=16)

a) Describe in detail the pathway of Denovo synthesis of fatty acids and its regulation.

b) What is acid base balance ? Write about acid base imbalance and its causes.

c) Describe in detail about homeostasis of blood

Paper – 2

NOV./DEC. 2008

(2 ½ hours) Total marks : 40

SECTION – B – (SAQ)

2. Write short answers. (any 6):(6x4=24)

a) Absorption of iron.

b) Ketosis.

c) Tumor markers.

d) Fatty liver.

e) Radio isotopes – Diagnostic and Therapeutic uses.

f) A 38 year old person suffering from fever and chills was diagnosed as malaria patient. He was given antimalarial drug primaquine. After few days, he complained of passing red coloured urine and weakness. Laboratory data showed Hb level 7.5 gm percent and unconjugated bilirubin 7.8 mg / dl.

i) What is probable diagnosis?

ii) What defect is responsible?

iii) Why rise in unconjugated bilirubin?

iv) Explain mechanism of anemia.

g) An adolescent individual came to the OPD with complaints of growth failure. Sexual immaturity, loss of taste acuity and delayed wound healing.

i) Identify deficient mineral.

ii) What is its RDA?

iii) Mention its food sources.

iv) Name the enzymes associated with this mineral.

SECTION – C – (LAQ)

3. Attempt. (any 2) : (2x8=16)

a) Mention normal blood glucose level in fasting and post prandial condition. How blood glucose level is regulated? Mention renal threshold for glucose.

b) Describe absorption and functional role of calcium. Mention its food sources and daily requirement in various age groups.

Paper – 2

MAY/JUNE 2008

(2 ½ hours) Total marks : 40

SECTION – B

2. Brief answer question : (any 6 of 7) : (6x4=24)

a) Metabolic changes during starvation.

b) Functions of Albumia.

c) Lipoproteins.

d) Glycosamine glycans.

e) Oncogenes.

f) A 50 year old man admitted with recurrent pain in abdomen, developed jaundice two-days after admission. Ultrasonography reveals enlarge head of pancreas. A routine urine examination show the presence of bile pigments but urobilonogen was absent. Stool examination revealed chalky white coloured stools.

i) What is the type of jaundice?

ii) What is the most like cause?

iii) Explain the findings in urine.

Iv) Which are the blood tests to be done in this patient?

g) A 50 year old man admitted to the hospital in a confused and semiconscious state. Several days before admission, he was complaining of undue thirst and also started to get up several times during the night to urinate. His breath had fruity odour. Following is the data of his laboratory investigations.

i) Blood glucose (random) – 480 mgm/dl

ii) Rothera's test on urine – Purple ring

iii) Urine sugar – Present (++++)

i) What is the probable diagnosis?

ii) Describe the biochemical basis giving rise to following conditions.

Increased thirst and frequency of urination.

Fruity odour to the breath.

SECTION – C

3. Solve (any 2 of 3) : (2x8=16)

a) Enumerate fate of acetyl CoA. Describe the process of fatty acid synthesis.

b) Give role of various enzymes in Liver functions tests.

c) Describe in detail the tricarboxylic acid with its energetics. Describe its amphibolic nature.

Paper - 2

MAY/JUNE 2007

(2 ½ hours) Total marks : 40

SECTION – B

2. Brief answer questions : (any 6 of 7) (6x4=24)

a) Glycogen storage disease.

b) Fatty liver and Lipotropic factors.

c) Urea clearance.

d) Chemical carcinogens.

e) Metabolic acidosis.

f) A patient in the hospital and seizures and usually appear weak and tired. Physical finding was deposition of copper in eyes as green ring round the comes and hepatomegaly.

i) What is the probable disease?

ii) What is biochemical problem in this disease?

iii) What is treatment to this disease?.

iv) Name any four copper containing enzymes.

g) A 3 year old boy with mental retardation was found to have cataracts. Biochemical investigations show high blood concentration of galactose.

i) Name the probable disease and name the enzyme most likely to be defective.

ii) What is the cause for development of cataract ?

iii) Give the reaction catalyzed by defective enzyme.

iv) What is treatment for this disease?

SECTION – C

3. Long answer questios: (any 2 of 3)(2x8=16)

a) Describe Hexose Monophosphate Shunt. What is significance of HMP Shunt?

b) Give an account of biosynthesis of cholesterol. State its functions of cholesterol.

c) Write in detail about the factors influencing calcium absorption in the body. Write its function.

Paper - 2

JUNE/JULY 2006

(2 ½ hours) Total marks : 35

SECTION – B

2. Write short answers. (any 5 of 6) : (5x2=10)

a) State any four factors affecting the calcium absorption.

b) Diagram showing transport of Acetyl CoA from mitochondria to cytosol.

c) State the principle of flamephotometry.

d) Name any four chemical carcinogens.

e) Give four examples of detoxication by oxidation.

f) Explain the mechanism of ADH hormone action.

3. Solve (any 2 of 3) : (2x4=8)

a) Amphibolic role of T.C.A. cycle.

b) Liver function test based on excretion ability of liver.

c) A 45 year old obese man complained of gastric pain and admitted In hospital due to heavy alcohol ingestion. Blood was taken for organ function test. Serum looked opalescent and analysed for lipids. Serum cholesterol was 310 mg% and serum triglyceride was 690 mg%.

a) What is probable diagnosis? **02**

b) Which additional test you will perform. **02**

SECTION – C

4. Describe the metabolism of glycogen and its hormonal regulation. **(1x9=9)**

OR

Describe the lipid metabolism in adipose tissue with its hormonal regulation.

5. Answer (any 2 of 3) : (2x4=8)

a) Describe Urea clearance test.

b) Cori cycle and its importance.

c) Catabolism of cholesterol & its functions.

Paper – 2

JULY/AUGUST 2005

(2 ½ hours) Total marks : 35

SECTION – B

2. Write answers to (any 5 of 6): 10

a) Define Rancidity. Write 2 causes.

b) Diagrammatic representation of outline of Cholesterol biosynthesis.

c) Write four factors affecting iron absorption.

d) Write four characteristics of growing tumor cells.

e) Role of TPP in carbohydrate metabolism.

f) Reguation of Electrolyte Balance and role of Aidosterone and ADH

3. Solve (any 2 of 3): (2x4=8)

a) Metabolic Acidosis.

b) Fatty liver.

c) Discuss the biochemical parameters for the differential diagnosis of jaundice.

SECTION – C

4. Define polysaccharides and describe the Glycogen metabolism with its regulation.

OR

Define balace diet. Discuss the protein energy and malnutrition with nutritional importance of proteins.

5. Answer (any 2 of 3) : (2x4=8)

a) Insulin.

b) Write about detoxification by phase l.

c) State the principle of electrophoresis and Flame photometer with their uses.

Paper – 2

JUNE/JULY 2004

(2 ½ hours) Total marks : 35

SECTION – B

2. Write short answers: (any 5 of 6):10

a) Diagram showing role of carnitine.

b) List four radioisotopes and give their significance.

c) Name the lipoprotein and give one function each.

d) Differentiate between primary and secondarydehydration.

e) What is normal blood glucose level? Enlist the hormone that regulate blood sugar.

f) Explain anomers.

3. Solve (any 2 of 3) : 08

a) Explain any four types of detoxification by conjugation.

b) Tests based on excreatory functions of liver-principle and importance.

c) 25 year old man on treatment with anti-malarial crisis indicated by decreased Hb% increased serum bilirubin and no bile pigment in urine.

i) Name the defect & enzyme.

ii) Explain the biochemical basis of development of hemolytic disease.

SECTION – C

4. Describe the glycolytic pathway in erythrocytes. What is its significance and how does it differ from glycolysis in other cells? **09**

OR

Explain the synthesis of cholesterol and its control.

5. Answer (any 2 of 3) : **08**

a) Regualtion of serum calcium.

b) What is fatty liver ? Explain the role of lipotropic factors.

c) Mechanism of action of Lipophobic hormones.

Paper – 2

OCTOBER 2003

(2 ½ hours) Total marks : 35

SECTION – B

2. Write short answers (any 5 of 6) : **10**

a) State the principle of colorimetry and electrophoresis.

b) What are tumor markers? Give two examples.

c) Diagrammatic representation of Cori's cycle.

d) Write one reaction each involving biotin and pyridoxial phosphate.

e) What are epimers? Give two examples.

f) Write four important functions of prostaglandins.

3. Solve (any 2 of 3) : **08**

a) Dehydration.

b) Metabolic changes during starvation.

c) 53 year old male diabetic is admitted in a semicomatic condition. His fasting blood glucose level is 410 ml % with urine sugar +++ and urine ketone bodies positive.

i) Name the clinical condition.

ii) Explain the underlying cause.

iii) What is renal threshold for glucose ?

iv) Describe the test for urinary ketone bodies.

SECTION – C

4. Explain the reaction on citric acid cycle with the help of a flow chart. Add a note on its energetics and significance. Explain Anaplerotic reactions with one example. **09**

OR

Describe in detail the extra-mitochondiral de novo synthesis of palmitic acid with energetics.

5. Answer (any 2 of 3) : **08**

a) Nutritional importance and metabolism of calcium.

b) Classify liver function tests giving examples for each.

c) Give the composition and functions of any four phospholipids.

Paper – 2

MAY 2003

(2 ½ hours **Total marks : 50**

SECTION – B

2. Write short answers (any 5 of 6) : **10**

a) State the causes of primary dehydration.

b) Formation and breakdown of cyclic AMP.

c) Biochemical functions of phosphorus.

d) Compare and contrast starch and glycogen.

e) Give one example each for :

i) Phospholipid.

ii) PUFA

iii) Lipotropic factor

iv) Bile acid.

f) What is metabolic acidosis ? Name any two pathological conditions which lead to metabolic acidosis.

3. Solve (any 2 of 3) : **08**

a) What are the commonly used tumor markers? Explain the chemical use of each.

b) Lipoproteins.

c) Blood Galactose levels were found to be elevated in an infant. Galactose was also detected in the urine. :

i) Name the disease.

ii) Give the biochemical step(s) related to the disease and point the metabolic defect.

iii) What are the clinical manifestations of the disease?

SECTION – C

4. Describe the mechabnism of hormone action. **09**

OR

Explain Glycogenalysis and its regulation.

5. Answer (any 2 of 3) : **08**

a) Absorption, transport and storage of iron.

b) Glycosaminoglycans.

c) Explain the role of various blood buffers in the maintenance of blood pH.

Paper – 2

24th OCTOBER, 2002

(2 ½ hours) Total marks : 35

SECTION – B

2. Write short answers : (Any 5) : **10**

a) Name two radio isotopes and mention their applications in medicine.

b) State the principle of flame photometry.

c) State the factors affecting iron absorption.

d) Draw a representation of the action of phospholipases on lecithin.

e) Give a diagrammatic representation of mechanism of steroid hormone action.

f) Give four examples of detoxication by conjugation.

3. Answer in short : (any 2) **08**

a) i) State the enzyme deficient and major clinical manifestations in Von Gierke's disease.

ii) Explain the defect in Wilson's disease, state the clinical mani-festations

b) i) Explain the role of various enzymes in liver function tests.

ii) Explain glucose-6-phosphate de-hydrogenase (G6PD) deficiency.

c) A person presents with untreated diabetes mellitus. He is treated for acidosis.

i) What is the type of acidosis?

ii) What is the normal bicarbonate: Carbonic acid ratio? What will happen to the ratio in this patient?

iii) How will compensation occur?

iv) What is the role of kidney in correcting the adidosis?

SECTION – C

4. What is gluconeogenesis? Describe the reactions of gluconeogenesis. State the fate of the precursors of this pathway. How is gluconeogenesis regulated? **09**

OR

Explain the three major stages of cholesterol synthesis. How is this regulated ?

5. Attempt (any 2) : **10**

a) Eicosanoids.

b) Chromatography.

c) Mechanism of hormonal action for any two hormones.

Paper – 2

30th,MAY 2002

(2 hours) **Total marks : 35**

SECTION – B

2. Write short answers (any 5 of 6) : **10**

a) Draw the diagrm explaining the principle of flame photometer. Give the uses of flame photometer.

b) Give four important factors affecting absorption of iron.

c) Give four important radiation monitoring precautions.

d) Give four important functions of (PUFA) polyunsaturated fatty acids.

e) Mention four tumour markers with their clinical significance.

f) Mention four glycogen storage diseases with their deficient enzymes.

3. Answer in short: (any 2) **08**

a) Fatty liver and lipotropic factors.

b) Hyper cholesterolemia.

c) Metabolic changes in diabetes mellitus.

SECTION – C

4. Discuss the various mechanisms for regulation of Acid-base balance. **09**

OR

Classify Liver Function Tests (LFT). Describe any two tests in detail.

5. Attempt: (any 2) : **10**

a) Eicosanoids.

b) Chromatography.

c) Mechanism of hormonal action for any two hormones.