



B-4005
First Year M. B. B. S. Examination
July - 2017
Biochemistry : Paper - I

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 50

Instruction :

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| <p>नीचे दशादिख निशानीवाणी विगतो उत्तरवदी पर अवश्य बानवी. Fillup strictly the details of signs on your answer book.</p> <p>Name of the Examination : First Year M. B. B. S.</p> <p>Name of the Subject : Biochemistry : Paper - I</p> <p>Subject Code No. : 4 0 0 5 Section No. (1, 2.....) : 1&2</p> | <p>Seat No. : □ □ □ □ □ □</p> <p style="text-align: center; border: 1px solid black; border-radius: 15px; padding: 10px;">Student's Signature</p> |
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SECTION - I

- 1 Short notes : (2 out of 3) 2×4=8
- (a) Describe glycogen synthesis and breakdown pathways.
 - (b) Metabolism of Very low density lipoproteins.
 - (c) Metabolic alterations in diabetes mellitus. Mention the names of hormones which play significant role in the control of blood glucose levels.
- 2 Short notes : (4 out of 6) 4×3=12
- (a) Metabolic changes during starvation (any four).
 - (b) Site specific inhibitors of electron transport chain.
 - (c) Fetoproteins as tumor markers.
 - (d) Dietary fiber and its importance.
 - (e) Give two examples of phospholipids and various functions of phospholipids (Four functions).
 - (f) Regulation of serum calcium levels.

- 3 Answer in one or two lines : (5 out of 6) 5×1=5
- (a) Functions of prostaglandins (any four).
 - (b) Energy generation aspects of anaerobic glycolysis.
 - (c) Facilitated and active transport.
 - (d) Names of two mucopolysaccharides and their functions.
 - (e) Essential fatty acids.
 - (f) Role of lead in iron metabolism.

SECTION - II

- 4 Read the following case and answer the questions : 5×2=10

A 10-year-old young girl complained of easy fatigability and tiredness. She was not able to concentrate in the class leading to fall in her grades. She appears uninterested in her surroundings and looked very pale. On examination she had pallor. Laboratory tests were ordered for complete blood count, hemoglobin, iron, TIBC and transferrin. It was diagnosed as iron deficiency anemia. She was put on iron rich supplements and diet.

- (a) How iron is absorbed ?
- (b) What is the recommended daily intake of iron in adults and pregnant women ?
- (c) What is transferrin and what is its connection with iron ?
- (d) Name the four causes of development of iron deficiency anemia.
- (e) What is the biochemical basis (pertaining to iron) for easy fatigability and tiredness in the young girl of above case ?

5 Write justification : (5 out of 7) 5×2=10

- (a) Carnitine plays important role in the oxidation of fatty acids in mitochondria.
- (b) Muscle cannot contribute towards maintaining of blood glucose level.
- (c) Administration of oxidant drugs to the person with glucose 6 phosphate dehydrogenase deficiency leads to clinical complications.
- (d) Hyperuricemia may be observed in Von Gierke's disease.
- (e) Cataract may be developed at an early age in uncontrolled diabetes mellitus.
- (f) More energy is generated from 1 gm of lipids compared to 1 gm of carbohydrates.
- (g) Premature babies likely to develop respiratory distress syndrome.

6 Answer in one or two lines : (5 out of 6) 5×1=5

- (a) Different substrates for gluconeogenesis (any four).
- (b) HDL - Cholesterol.
- (c) Protein-Energy malnutrition.
- (d) Omega 3 and 6 fatty acids.
- (e) ELISA.
- (f) Ketoacidosis.



B-4006
First Year M. B. B. S. Examination
July - 2017
Biochemistry : Paper - II

Time : 2½ Hours]

[Total Marks : 50

Instruction :

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| <p>नीचे दशांशिक निशानीवाणी विजानो किररवही पर अवश्य ब्रजवी. Fill up strictly the details of signs on your answer book.</p> <p>Name of the Examination : First Year M. B. B. S.</p> <p>Name of the Subject : Biochemistry : Paper - II</p> <p>Subject Code No. : 4 0 0 6 Section No. (1, 2,.....) : 1&2</p> | <p>Seat No. : □ □ □ □ □ □</p> <p>Student's Signature</p> |
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SECTION - I

- 1 Short notes : (2 out of 3) 2×4=8
- (a) Vitamin C - sources, functions and deficiency manifestations.
 - (b) Bilirubin-formation, transport and excretion. Name the different types of acquired hyperbilirubinaemias.
 - (c) Transcription - (required components including enzymes and process).
- 2 Short notes : (4 out of 6) 4×3=12
- (a) Applications of Recombinant DNA technology.
 - (b) Phase-II reactions of detoxification.
 - (c) Biologically short peptides (give examples of two such peptides with functions).
 - (d) Suicide inhibition with examples.
 - (e) Diagnostic importance of isoenzymes.
 - (f) Coenzyme role of Vitamin B₁₂.

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- 3 Answer in few lines : (5 out of 6) 5×1=5
- (a) Denaturation of proteins.
 - (b) Give the functions of two nonfunctional plasma enzymes.
 - (c) Serum markers for obstructive jaundice.
 - (d) Applications of gene therapy.
 - (e) Acute intermittent porphyria.
 - (f) Four functions of glycine.

SECTION - II

- 4 Read the following case and answer the questions : 5×2=10

A 40-year-old lady presented to ophthalmology OPD of tertiary care hospital with complaints of diminished vision specially at night since 3 months. She revealed that she was suffering from Crohn's disease (Chronic inflammatory bowel disease) since 10 years and for that intestinal resection surgery was done before two years. On examination her eyes were dry. Serum Vitamin A levels were found to be much below than the reference range. She was put on Vitamin A supplements and diet rich in Vitamin A.

- (a) Explain the relation between the decreased vision in dim light and vitamin levels.
- (b) What are Retinoids ?
- (c) Give the deficiency manifestations of Vitamin A.
- (d) Excessive intake of fat soluble vitamins may be toxic - justify.
- (e) Give the normal reference range of serum Vitamin A and recommended daily intake of this Vitamin for adults.

5 Write justification : 5 out of 7 5×2=10

- (a) Methotrexate is one of the drug used in cancer treatment.
- (b) Vitamin D is more of like hormone than vitamin.
- (c) Proline is not found in α -helix pattern.
- (d) Methemoglobin cannot transport oxygen.
- (e) Edema is observed in children with kwashiorkor.
- (f) Nucleotides have many functions apart from their structural role in DNA and RNA.
- (g) Hypoxanthine-guanine phosphoribosyl transferase is an important enzyme in brain.

6 Answer in one or two lines : 5 out of 6 5×1=5

- (a) Features of mismatch repair.
- (b) Functional aspects of second messengers with examples.
- (c) Products formed from tyrosine.
- (d) Chargaff's rule.
- (e) Features of genetic code.
- (f) Biochemical basis of thalassemia and consequences of thalassemia.



SECTION - II

B-3704

First M. B. B. S. Examination

December - 2017

Biochemistry : Paper - I

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 50

Instruction :

नीचे दशांशव - निशानीवाणी विगतो उत्तरवदी पर अवश्य बजदी.
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Name of the Examination :
First M. B. B. S.

Name of the Subject :
Biochemistry : Paper - I

Subject Code No. : 3 7 0 4 Section No. (1, 2,.....): 1&2

Seat No. :

Student's Signature

SECTION - I

- 1 Short notes : (2 out of 3) 8
- (1) Biochemistry of diabetes mellitus
 - (2) Describe metabolism of HDL and LDL
 - (3) Absorption and Metabolism of Calcium
- 2 Describe in brief : (4 out of 5) 12
- (1) Digestion and absorption of carbohydrate
 - (2) Structure and composition of cell membrane
 - (3) Renal function tests
 - (4) Ketone Body Synthesis
 - (5) Renal Regulation of Blood PH.
- 3 Answer in one or two lines : (5 out of 6) 5
- (1) Principle of chromatography
 - (2) Sources of iron in food
 - (3) Role of bile salt in lipid digestion
 - (4) Normal plasma lipid profile
 - (5) Importance of glycated hemoglobin
 - (6) Oedema in protein malnutrition.

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SECTION - II

4 Clinical Case with 5 questions : 10

45 yrs old male with BMI of 35 kg/m^2 and diagnosis of Diabetes Mellitus for 17 yrs. came to medicine OPD for increased frequency of urine, tingling, and numbness in upper limbs, diarrhea. Treatment for Diabetes Mellitus was irregular for last 3 months. Clinicians advised report of random plasma glucose: the result was 332 mg\% , Serum Na^+ was 127 mmol/L and Serum K^+ was 2.88 mmol/L . Serum Ketone Bodies were found elevated. Treatment with Oral Rehydration Salt (ORS) and Insulin was started.

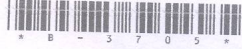
- Explain Body Mass Index (BMI).
- Why ORS contain glucose and sodium?
- Why there is increased frequency of urine in the patient?
- Why serum Ketone Bodies are elevated in Diabetes Mellitus?
- Is serum K^+ in the patient normal/elevated or low? What are effects of abnormal serum K^+ in body?

5 Answer in few lines : (5 out of 7) 10

- Ethanol is used to treat methanol poisoning.
- Sucrose is nonreducing sugar.
- For estimation of blood sugar, blood is collected in fluoride bulb.
- Glucocorticosteroid is used as anti-inflammatory drug.
- Blood for serum potassium estimation should not be haemolysed.
- Fruits and vegetables are essential in food.
- Statin reduces cholesterol synthesis.

6 Answer in one or two lines : (5 out of 6) 5

- Digestion of sucrose
- Principle of ELISA
- Biochemical effects of Cigarette smoking
- Importance of any two Tumor markers
- Reference ranges for fasting and post-glucose plasma glucose
- Biological functions of cholesterol in body.



B-3705

First M. B. B. S. Examination

December - 2017

Biochemistry : Paper - II

Time : $2\frac{1}{2}$ Hours]

[Total Marks : 50

Instruction :

नीचे दशांश लिखें निम्नलिखित विगतों उत्तरवली पर अवश्य लिखवी.
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Name of the Examination :
First M. B. B. S.

Name of the Subject :
Biochemistry : Paper - II

Subject Code No. : 3 7 0 5 Section No. (1, 2,.....) : 1&2

Seat No. :

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Student's Signature

SECTION - I

- 1 Short notes : (2 out of 3) 8
 - (1) Describe Primary & Secondary structures of protein.
 - (2) Vitamin D - Sources, functions and deficiency manifestations.
 - (3) DNA Replication.
- 2 Describe in brief : (4 out of 5) 12
 - (1) Explain "Ammonia is toxic to brain".
 - (2) Molecular basis of Sickle cell anaemia.
 - (3) Polymerase chain reaction.
 - (4) Characteristic of Genetic Code.
 - (5) Hyperuricemia and gout.
- 3 Answer in one or two lines : (5 out of 6) 5
 - (1) Type of Mutation.
 - (2) What are Xenobiotics?
 - (3) Mention important compounds synthesized from tyrosine.
 - (4) Enzyme pattern in diagnosis of acute myocardial infarction.
 - (5) Zwitter ions.
 - (6) Competitive inhibition of enzymes.

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SECTION - II

4 Clinical Case with 5 questions : 10

56 year male patient came in emergency with altered consciousness & haematemesis. He was suffering from chronic cirrhotic liver disease due to chronic alcoholism. On examination, it was found that he has edema on both lower limb, fluid collection in peritoneal cavity (Ascites), yellowish discoloration of skin & sclera (icterus). On blood investigation following was found.

Blood Glucose : 50 mg%,

APTT - Test : 60 second (Increase)

Serum Protein : 5.5 gm%

Serum Albumin : 2.0 gm%

Serum Total Billirubin : 20 mg%

Physician advised to give Following treatment

10% Dextrose with Thiamine (Vit-B1), 10% Albumin, Vitamin K, Oral Neomycin (Antibiotic)

Questions :

- (1) Explain biochemical reason for edema & ascites in this patient.
- (2) Explain biochemical reason for yellowish discoloration of skin & sclera?
- (3) What is reason for increase APTT in this case ?
- (4) How Oral Neomycin (Anti-microbial, Antibiotic) reduces risk of cerebral encephalopathy?
- (5) What is role of Vitamin K in this case?

5 Answer in few lines : (5 out of 7) 10

- (1) Alpha-1 antitrypsin deficiency causes emphysema.
- (2) Telomerase is essential for dividing cell.
- (3) Haemoglobin is good blood buffer.
- (4) In the presence of uncouplers of oxidative phosphorylation, body temperature rises.
- (5) Bile salts are detected in the urine of obstructive jaundice.
- (6) Strict vegetarian may suffer from vitamin B₁₂ deficiency.
- (7) Write different isoenzymes of CPK and LDH.

6 Answer in one or two lines : (5 out of 6)

5

- (1) Definition & example of Co-Enzyme
- (2) Type of RNA
- (3) Role of 2, 3 BPG in oxygen transport by hemoglobin.
- (4) Why tyrosine becomes an essential amino acid for patients of phenylketoneuria?
- (5) Role of ATP in body
- (6) Major biochemical functions of liver.