2019 Scheme

Q.P. Code: 116001 Reg. no.: .....

First Professional MBBS Degree Supplementary (SAY) Examinations October 2024
Biochemistry Paper - II

Time: 3 Hours **Total Marks: 100**

- ***Answer all questions to the point neatly and legibly • Do not leave any blank pages between answers***
- ***Indicate the question number correctly for the answer in the margin space***
- ***Answer all parts of a single question together • Leave sufficient space between answers***
- ***Draw table/diagrams/flow charts wherever necessary***

1. **Multiple Choice Questions** **(20x1=20)**

The Answers to MCQ questions (Q.No. i to Q.No. xx) shall be written continuously on the first two writing sheets (ie Page No. 3 & 4) only

Questions i-v are single response type questions

i. Normal reference level of Blood urea
a)3-5 mg/dL b) 20-40 mg/dL c) 75-100mg/dL d) 135-145 mg/dL.

ii. Electrophoresis is used to separate the following biomolecules
a) Serum proteins b) Lipoproteins c) Hemoglobins d) All of the above

iii. Serum electrolytes are estimated using
a) Colorimetry b) Fluorimetry c) Ion selective electrode d) Spectrophotometry

iv. Lysyl oxidase enzyme required for cross-links in collagen is dependent on
a) Calcium b) Copper c) Iron d) Magnesium

v. The disease occurs due to the defect in nucleotide excision repair
a) Xeroderma pigmentosa b) Colon cancer c) Fanconi's anemia d)Stomach cancer.

Question numbers vi-x are multiple response type questions. Read the statements and mark the answers appropriately.

vi. The following statements about genetic code are true.
1) AUG is the initiator codon
2) UAG is a stop codon
3) Glycine has only one codon
4) Arginine has two codons
a) 2 & 3 b) 1 & 2 c) 3 & 4 d) 1 & 4

vii. The following are examples of inactivated vaccines
1) Polio 2) Covaxin 3) Covishield 4) Diphtheria
a) 2 & 3 b) 1 & 2 c) 3 & 4 d) 1 & 4

viii. Select the incorrect pairs
1) Congenital erythropoietic porphyria – urine portwine colour
2) Congenital erythropoietic porphyria – Autosomal dominant
3) Hereditary protoporphyria – Ferro chelatase deficient
4) Acute intermittent porphyria- photosensitivity present
a) 1 & 3 b) 2 & 4 c) 1 & 2 d) 3 & 4

ix. The following statements regarding hemolytic jaundice are true
1) Increased levels of serum unconjugated bilirubin
2) Increased excretion of unconjugated bilirubin in urine
3) Increased Urobilinogen excretion in urine
4) Increased levels of serum conjugated bilirubin
a) 1 & 3 b) 2 & 4 c) 1 & 2 d) 3 & 4

x. The following are Congenital Hyperbilirubinemias with increase in unconjugated bilirubin levels in blood.
1) Criggler-Najjar Type 1 3) Gilbert's disease
2) Criggler-Najjar Type 2 4) Dubin- Johnson Syndrome
a) 2, 3, 4 b) 1, 2, 3 c) 1, 2, 4 d) 1, 3, 4

For Questions xi-xv there are two statements marked as - Assertion (A) and Reason (R). Mark your answer as per the options provided

xi. Assertion (A): In chronic granulomatous disease, macrophages ingest bacteria normally but cannot destroy them
Reason (R) : NADPH oxidase is absent in macrophages and neutrophils.
a) Both A and R are correct but R is not the reason for A c) Both A and R are incorrect
b) A incorrect R Correct d) Both A and R are correct, R is the reason for A

xii. Assertion(A): In Addison's disease, there is hyperpigmentation of skin
Reason (R): Plasma cortisol levels are low
a) Both A and R are correct but R is not the reason for A c) A incorrect R Correct
b) A Correct R incorrect d) Both A and R incorrect

xiii. Assertion (A): Glucose-6-Phophatase deficiency is a cause of primary Gout
Reason (R): Glucose-6-Phophate is converted to glucose and decreased PRPP
a) Both A and R are correct but R is not the reason for A c) Both A and R incorrect
b) A correct and R incorrect d) Both A and R are correct, R is the reason for A

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xiv. Assertion (A): Histones facilitate the packing of DNA into condensed chromatin fibers.
Reason (R): Histones contain positively charged amino acids arginine and lysine
a) Both A and R are correct but R is not the reason for A c) A incorrect R Correct
b) A correct R incorrect d) Both A and R are correct, R is the reason for A

xv. Assertion (A): Streptomycin is a bactericidal antibiotic
Reason(R): It binds to 30S subunit of bacterial ribosome and inhibits protein synthesis
a) Both A and R are correct but R is not the reason for A c) A incorrect R Correct
b) A correct R incorrect d) Both A and R are correct, R is the reason for A

Question numbers xvi-xx are case scenario-based questions

45 year old John was rushed to the hospital due to vomiting and a decreased level of consciousness. The patient displays slow and deep (Kussmaul breathing), and he is lethargic and irritable in response to stimulation. He appears to be dehydrated—his eyes are sunken and mucous membranes are dry—and he has a two-week history of polydipsia, polyuria, and weight loss.

Measurement of arterial blood gas shows

pH=7.0, PaO_2= 90 mm Hg, $PaCO_2$= 41 mm Hg, and HCO^-_3= 12 mmol/L;

other results are

Na+ 126 mmol/L, K+ 5 mmol/L, and Cl- 95 mmol/L. What is your assessment

xvi. The probable diagnosis for the above condition of John will be
a) Respiratory Acidosis b) Respiratory Alkalosis c) Metabolic Alkalosis d) Metabolic Acidosis

xvii. High anion gap metabolic acidosis is observed in the following condition
a) Renal tubular acidosis b) Diabetic ketoacidosis c) Diarrhoea d) Vomiting

xviii. The predominant buffer system of plasma is
a) Phosphate b) Bicarbonate c) Haemoglobin d) Protein

xix. Which one of the following condition does not cause metabolic alkalosis
a) Persistent vomiting b) Hyperaldosteronism c) Severe diarrhoea d) Thiazide diuretics

xx. Hypokalemia occurs in
a) Acidosis b) Alkalosis c) Both of the above d) None of the above

Long essays **(2x10=20)**

2. A 53-year-old woman came to OPD with history of weight gain, constipation, weakness and cold intolerance. On examination she had a neck swelling. The following thyroid function tests were done, with the reports as given below.
   - TSH - 54.6 mU/L (0.20–5.0)
   - Free T4 (fT4)- 5.7 pmol/L (12–25 pmol/L)
   a) Write the probable diagnosis
   b) Explain the laboratory assessment of the endocrine gland in detail
   c) Give a brief account of the disorders related to the gland (1+6+3)
3. What is translation. Describe the steps of translation leading to protein synthesis in detail. Give a brief note on the inhibitors of protein synthesis. (1+7+2)

Short Essays: **(6x6=36)**

4. Discuss the salvage pathway of purine synthesis. Add a note on the synthetic nucleotide analogues and the clinical significance (3+3)
5. Explain the different steps in PCR. Add a note on its applications (4+2)
6. A 57-year-old woman presented at clinic with intense jaundice, pruritus and hepatomegaly with abnormal liver function tests.
   - Total bilirubin- 12 mg/dl, Conjugated bilirubin- 10 mg/dl, unconjugated bilirubin- 2 mg/dl
   - Serum ALP=826 U/L
   a) What is the probable diagnosis
   b) Discuss the causes and lab findings for the above condition
   c) Add a note on Vanden bergh test (1+3+2)
7. What are the various renal mechanisms involved in regulation of blood pH
8. Explain the different types of immunoglobulins. Add a brief note on Multiple myeloma (4+2)
9. Discuss about the different types of proteinuria in detail.

Short Answers **(6x4=24)**

10. RFLP (Restriction Fragment Length Polymorphism)
11. Gene Therapy
12. Name the types of antioxidants and discuss their role in scavenging of free radicals.
13. Give reason-
    a) High anion gap metabolic acidosis in renal failure b) Iron overload in Thalassemia
14. Give biochemical basis of:
    a) Anaemia in lead poisoning
    b) Sickling of RBC in Sickle cell Anaemia
15. How is lifelong learning relevant to the professional growth of doctors

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