 2019 Scheme

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

First Professional MBBS Degree Regular/Supplementary Examinations July 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 **(1x20=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. Transparency of corneal endothelium is maintained by
a) Heparan sulphate b) Chondroitin sulphate c) Keratan sulphate d) Hyaluronic acid

ii. Mismatch repair defect is seen in
a) Xeroderma pigmentosa c) MutyH Polyposis
b) Hereditary Non polyposis colorectal cancer d) Ataxia Telangiectasia

iii. Which of the following is NOT an emergency investigation
a) Potassium b) Fasting glucose c) Creatinine d) Calcium

iv. All the following statements about a live attenuated vaccine are true, EXCEPT
a) A single dose is sufficient
b) It induces shorter but effective immunity
c) It induces humoral and cell-mediated immunity
d) It can be administered by the route of natural infection to induce local immunity

v. All the following are nucleic acids, EXCEPT
a) Plasmids b) Prions c) Cosmids d) Virions

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

vi. Regarding gene therapy choose the correct statement
1) In ex-vivo strategy, patients' cells with modified genes are administered to the patient
2) In in-situ strategy, expression cassette is introduced to the patients' blood or tissue
3) In in-vivo strategy, vector is administered to the cells or tissues
4) Somatic gene therapy is being tried
a) 1 & 2 b) 1, 2 & 3 c) 1, 3 & 4 d) All are correct

vii. From pairs of diseases and associated abnormalities, pick out the mismatched pair:
1) Maple syrup urine disease and metabolic acidosis
2) Conn's syndrome and Metabolic acidosis
3) SIADH (Syndrome of Inappropriate Antidiuretic Hormone) and hypertonic expansion
4) Waldenstrom's macroglobulinemia and hyperviscosity
a) 2 & 4 b) 1, 2 & 3 c) 1 & 3 d) 2 & 3

viii. The laboratory data that is against a diagnosis of obstructive jaundice is
1) High alkaline phosphatase level
2) Increased excretion of urobilinogen in urine
3) Elevated serum cholesterol level
4) Indirect positive van den Bergh reaction
a) 2 & 4 b) 2 & 3 c) 3 & 4 d) 1, 2 & 4

ix. Choose the correct statement about plasmids
1) They are circular single-stranded RNA
2) Replicate independent of bacterial DNA replication
3) Specialised regions of bacterial chromosomes
4) Confer antibiotic resistance to host bacteria
a) 1 & 2 b) 1, 3 & 4 c) 2 & 4 d) 2, 3 & 4

x. Which of the following diseases are not attributed to free radical injury
1) Hypothyroidism 2) Cataract 3) Reperfusion injury 4) Type II Diabetes Mellitus
a) 1 & 2 b) 1 & 4 c) 2 & 4 d) 2 & 3

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): Creatinine clearance is a better index than urea clearance
Reason (R): Creatinine clearance is not affected by dietary protein Consumption
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): Restriction fragment length polymorphism can be used to settle cases of disputed parenthood
Reason (R): Both chromosomes of a pair show similar restriction pattern
a) Both A and R are correct c) Both A and R are incorrect
b) A incorrect R correct d) A correct R incorrect

(PTO)

xiii. Assertion(A): Cytochrome P450 is the chief enzyme responsible for clearance of majority of drugs
Reason(R): Cytochrome P450 catalyses through conjugation
a) Both A and R are correct but R is not the reason for A c) Both A and R are incorrect
b) A correct R incorrect d) Both A and R are correct R is the reason for A

xiv. Assertion(A): Analysis of plasma glucose in a plain tube can be done at any time after collecting sample – there won't be any change in plasma glucose level.
Reason(R): Glycolysis will reduce the patient blood glucose level
a) Both A and R are correct c) Both A and R are incorrect
b) A incorrect R correct d) A correct R incorrect

xv. Assertion(A): In hepatic jaundice, Hay's test will be positive
Reason (R): Hay's test is used to detect conjugated bilirubin
a) Both A and R are correct R is the reason for A c) Both A and R are incorrect
b) A correct R incorrect d) Both A and R are correct R is not the reason for A

Question numbers xvi-xx are case scenario-based questions

A 15-year old African boy studying in India was admitted to the medical ward with complaints of fever and severe body pains. On examination, hepatosplenomegaly was detected. His Hb levels were found to be very low (6.5g/dL). Microscopic examination of his blood smear revealed sickle-shaped RBC

xvi. Molecular basis of HbS is
a) Normal 2α and 2β globin chains c) Normal 2α and abnormal 2β globin chains
b) Abnormal 2α and normal 2β globin chains d) Abnormal 2α and 2β globin chains

xvii. In HbS, which of the following is true.
a) Valine replaced by glutamate c) Glutamate replaced by valine
b) Valine replaced by glycine d) Glycine replaced by valine

xviii. In sickle cell disease, sickling of RBCs is favorable when hemoglobin S is in
a) Oxygenated form b) Deoxygenated form c) Glycated form d) Oxidized form

xix. All the below complications can occur for the boy EXCEPT
a) Vasoocclusive crisis b) Organ damage c) Bleeding disease d) Pain and swelling in joints

xx. Regarding HbS and HbA all are true EXCEPT
a) Inclusion bodies will be seen both in HbS and HbA
b) Solubility of deoxy HbS is lower than deoxy HbA
c) HbS is slower moving on electrophoresis than HbA
d) Structural difference is with regard to beta chain

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

2. An unconscious patient was rushed to the Emergency department of the hospital. History taken from the attendant revealed that patient was a known Diabetic, blood samples were collected and sent to clinical laboratory for analysis.
   a) What could be your probable diagnosis
   b) Which relevant investigations you would suggest for this patient
   c) Explain the role of Kidneys in maintenance of Acid base homeostasis
   d) How is the compensation brought about in this patient (1+2+5+2)
3. Define and explain the steps involved in the process of Translation. What is Post Translational modifications, give four examples (1+6+3)

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

4. A patient gave history of recurrent episodes of vomiting and fever. On examination he was icteric, dehydrated and his liver was palpable. Following is the biochemical report of this patient: Serum total Bilirubin- 12 mg% conjugated bilirubin – 5.5 mg %, unconjugated bilirubin - 6.5 mg %, serum Alkaline phosphatase – 278 IU /L, AST – 235 IU/L , ALT – 365 IU/ L, Bile salts – Negative, Bile Pigments – positive , Fecal stercobilinogen – positive.
   a) What could be your probable Diagnosis
   b) Explain how Bilirubin is formed and excreted from the body. (1+5)
5. Discuss the clinical features, Biochemical basis and diagnosis of Gout
6. Thyroid function tests and their significance
7. Polymerase chain Reaction
8. Differentiate between active and passive immunity
9. Glucose Tolerance Test – give two indications. Explain the different responses seen

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

10. Role of Glucuronic acid in Detoxification
11. Chain breaking and Preventive antioxidants
12. Structure and two functions of Collagen
13. Give reason:
    a) Plasmids are used commonly as vectors in recombinant DNA techniques
    b) Low salt diet is recommended in patients with hypertension
14. Explain the Biochemical basis of :
    a) Folate antagonists are used as anti cancer drugs
    b) Hyperkalemia is a life threatening situation
15. Doctors should have a commitment for lifelong learning which is important for their professional growth – substantiate the statement.