Rajiv Gandhi University of Health Sciences, Karnataka

MBBS Phase – I (CBME) Degree Examination - 16-Feb-2023

Time: Three Hours **Max. Marks: 100 Marks**

BIOCHEMISTRY – PAPER II (RS-4)
Q.P. CODE: 1025
(QP contains three pages)

Your answers should be specific to the questions asked
Draw neat, labeled diagrams wherever necessary

LONG ESSAYS **2 x 10 = 20 Marks**

1. A 10 year old boy was brought to the hospital for self-multilating behaviour and delayed development. His serum uric acid level was 15 mg/dl. A provisional diagnosis of Lesch Nyhan syndrome was made.
   a) Write the biological reference interval for serum uric acid level.
   b) Name the enzyme defect and the pathway affected in the above disorder.
   c) Which tissues are dependent on this pathway?
   d) Enumerate the other causes of hyperuricemia
   e) What is the role of allopurinol in the treatment of hyperuricemia?

2. Describe the steps of DNA replication in prokaryotes. List the difference between prokaryotic and eukaryotic DNA replication.

SHORT ESSAYS **8 x 5 = 40 Marks**

3. A 15 year old tribal boy was admitted with complaints of fatigue, recurrent fever and pain in arms and legs. His peripheral blood smear shows sickled erythrocytes and a hemoglobin concentration of 6 gm%.
   a) Name the molecular defect in this disorder.
   b) Explain the mechanism of sickling.
   c) What is the cause of anemia in this condition?

4. An intravenous drug user was found to have developed jaundice. Laboratory investigations revealed hepatitis B infection. His total serum bilirubin was 10.2 mg/dl.
   a) What type of jaundice is seen in above case?
   b) Explain van den Bergh test and write its interpretation in the above case.

5. Describe the steps in this polymerase chain reaction (PCR). Name the type of PCR used in the diagnosis of Covid 19.

6. Name any three products derived from tyrosine. Describe the metabolic pathway leading to the formation of any one of the product from tyrosine.

7. Draw the structure of immunoglobulin G and label it. Enumerate its functions.

8. What is lipid peroxidation? Explain the role of antioxidants in scavenging reactive oxygen species.

9. Write the steps in the formation of creatine and glutathione from glycine.

10. Describe the glomerular function tests.

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SHORT ANSWERS **10 x 3 = 30 Marks**

11. Name three tumor markers and mention their significance.
12. What is the enzyme defect in maple syrup urine disease? What are its characteristic features?
13. List the adrenal function tests. Mention one disorder associated with abnormal adrenal function.
14. Enlist three biologically important peptides and write their functions.
15. What are xenobiotics? Write two detoxification reactions by conjugation.
16. Name three biologically important nucleotides and mention their importance.
17. Mention three advantages of automation in clinical biochemistry laboratory.
18. Enlist three post-translational modifications with suitable examples.
19. Mention normal albumin/globulin (A/G) ratio. Write two conditions where A/G ratio is altered.
20. What is restriction fragment length polymorphism (RFLP). Mention two clinical applications of RFLP.

Multiple Choice Questions **10 x 1 = 10 Marks**

21 i) All the following are glucogenic amino acids **EXCEPT**
- A. Valine
- B. Phenylalanine
- C. Glycine
- D. Leucine

21 ii) N_3 of purine ring is donated by
- A. Asparate
- B. Glycine
- C. Glutamine
- D. Ammonia

21 iii) Which of the following enzymes is responsible for immortality of cancer cells?
- A. Telomerase
- B. RNA polymerase I
- C. DNA polymerase
- D. Helicase

21 iv) In which of the following conditions is serum direct bilirubin elevated
- A. Physiological jaundice in the newborn
- B. Crigler – Najjar syndrome
- C. Gilbert's syndrome
- D. Gall stones

21 v) Enzyme defect in acute intermittent porphyria is
- A. ALA synthase
- B. ALA dehydratase
- C. PBG deaminase
- D. Uroporphyrinogen decarboxylase

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22 i) Closeness of a result to the true value is termed as
- A. Precision
- B. Accuracy
- C. Sensitivity
- D. Specificity

22 ii) Reference interval for pH of urine is
- A. 3.5 to 4.5
- B. 5.5 to 6.5
- C. 7.5 to 8.5
- D. 9.5 to 10.5

22 iii) Southern blotting technique is used for detection of
- A. DNA
- B. RNA
- C. Protein
- D. Lipoprotein

22 iv) Which of the following is an example for acute phase protein?
- A. Prothrombin
- B. C-reactive protein
- C. Lipoprotein A
- D. Thyroxine binding globulin (TBG)

22 v) Epidermal growth factor (EGF) is produced by
- A. Platelets
- B. Monocytes
- C. Endothelial cells
- D. Fibroblasts

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