Rajiv Gandhi University of Health Sciences, Karnataka

MBBS Phase – I (CBME) Degree Examination - 09-Feb-2024

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 fair 5 year old child was brought to the hospital by his parents, who complained of delayed milestones in the child. Investigations revealed a high phenylalanine content in the blood and a diagnosis of phenylketonuria was made.
   a) Name the enzyme defect in the above disorder.
   b) Explain the pathway for catabolism of phenylalanine.
   c) Name the compound responsible for the mousy odour in the above condition.
   d) List the biochemical investigations in phenylketonuria

2. Explain the process of recombinant DNA technology and list four applications in the field of medicine.

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

3. A 40 year old female with history of gall stones presented with acute pain abdomen, yellowish discoloration of sclera and passing clay coloured stools. Following investigations, a diagnosis of obstructive jaundice was made.
   a) Describe van Den Berg test and its findings in this condition.
   b) Name the enzyme that is elevated in this condition.
   c) Explain the biochemical reason for clay coloured stools in this case.

4. A 50 year old female presented with hoarseness of voice, dryness of skin and excess weight gain. The case was suspected to be hypothyroidism.
   a) List the tests for assessment of thyroid function.
   b) Write laboratory findings in a case of hypothyroidism.
   c) Differentiate between primary and secondary hypothyroidism.

5. Define proto-oncogene and oncogene. Explain the activation of oncogene.

6. Compare and contrast between replication in prokaryotes and eukaryotes.

7. Enumerate kidney function tests. Explain tubular function test.

8. Describe DNA repair mechanism with suitable examples.

9. What is gout? Write the causes and clinical features of gout.

10. Enumerate the functional classification of proteins with examples.

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

11. Draw and label the cell cycle.
12. What are histones? Enumerate their functions.
13. Draw a neat labelled diagram of immunoglobulin.
14. What are restriction endonucleases? Mention their importance.
15. Give biological reference interval of serum urea, serum albumin and serum creatinine.
16. Enumerate post-transcriptional modifications and write their significance.
17. Mention any three antioxidants and state their mechanism of action.
18. Write the structure and function of t-RNA
19. Give three examples for detoxification by conjugation mechanism.
20. Name thee pre-analytical variables that affect the biochemical laboratory results.

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

21 i) Which of the following is an essential amino acid?
- A. Glycine
- B. Phenyl alanine
- C. Aspartic acid
- D. Serine

21 ii) Hypoalbuminemia is seen in all the following conditions **EXCEPT**
- A. Cirrhosis of liver
- B. Nephrotic syndrome
- C. Kwashiorkor
- D. Dehydration

21 iii) Which of the following is a secretory immunoglobulin?
- A. IgG
- B. IgA
- C. IgM
- D. IgD

21 iv) Deficiency enzyme causing alkaptonuria is
- A. Tyrosinase
- B. Fumarylacetoacetate hydrolase
- C. Homogentisate oxidase
- D. Dopa decarboxylase

21 v) Bile salts and bile pigments are excreted in urine in
- A. Incompatible blood transfusion
- B. Gilbert's syndrome
- C. Carcinoma of head of pancreas
- D. Crigler-Najjar syndrome

22 i) Which of the following conditions is **not** associated with hyperuricemia?
- A. Gout
- B. Leukemia
- C. Psoriasis
- D. Xanthinuria

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22 ii) CA 125 is a tumor marker for
- A. Ovarian cancer
- B. Hepatoma
- C. Carcinoma breast
- D. Pheochrmocytoma

22 iii) Which of the following is an example of enzyme which scavenges free radicals?
- A. Hexokinase
- B. Aconitase
- C. Fumarase
- D. Catalase

22 iv) α-1 antitrypsin deficiency is associated with
- A. Wilson's disease
- B. Cirrhosis of liver
- C. Emphysema
- D. Multiple myeloma

22 v) Clearance values of all of the following compounds are used to test glomerular function of kidney **EXCEPT**
- A. Glucose
- B. Creatinine
- C. Inulin
- D. Urea

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