

# Rajiv Gandhi University of Health Sciences, Karnataka

## MBBS Phase – I (CBME) Degree Examination - 13-Dec-2024

**Time: Three Hours****Max. Marks: 100 Marks****BIOCHEMISTRY – PAPER II (RS-4)****QP 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 25-year-old female presented with mild anemia, jaundice and splenomegaly. She had previous history of frequent blood transfusion. Laboratory investigations shows spherocytes (70%), increased reticulocyte count and findings of hemolytic jaundice.
  - a. Write the serum and urinary findings in a case of hemolytic jaundice.
  - b. Enumerate the steps in the formation and fate of bilirubin.
  - c. List two more conditions leading to hemolytic jaundice
2. Enumerate the steps of transcription in prokaryotes. Write the post-transcriptional modifications.

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

3. An Eight month old child was brought to hospital for frequent episodes of vomiting and failure to thrive. On examination, the child was drowsy and had hepatomegaly. Laboratory investigations revealed increased serum ammonia levels.
  - a. Mention the transport form of ammonia.
  - b. Name the urea cycle disorders and write their enzyme defect.
4. The following is the laboratory investigations in a patient who presented with oedema.

Parameter	Serum Total Protein	Serum Albumin	A/G Ratio
Results	5.0 g/dl	2.3 g/dl	0.85:1

- a. Mention normal A/G ratio (Albumin/Globulin ratio).
  - b. Write two conditions in which A/G ratio is altered.
  - c. Write two functions of albumin.
5. Enumerate the steps in the formation of uric acid.
  6. Explain the structure of immunoglobulin with a neat labelled diagram.
  7. Write the nutritional classification of amino acids with examples.
  8. Write the steps of polymerase chain reaction (PCR). Mention two applications of PCR.
  9. Write five examples of Transmethylation reactions.
  10. What are oncogenes and proto-oncogenes? Explain the mechanism of activation of oncogene.

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**SHORT ANSWERS****10x3=30 Marks**

11. Write three features of genetic code.
12. What is gene therapy? Mention two conditions where gene therapy is applied.
13. Name the vectors used in Recombinant DNA technology and write their importance.
14. Write the mechanism of action of steroid hormones.
15. Name three pre-analytical variables affecting laboratory results.
16. Write the structure and function of t-RNA.
17. Name three antioxidant enzymes and write their importance.
18. What is clearance test? Why creatinine clearance is preferred over urea clearance test?
19. Write three examples for detoxification reaction by conjugation mechanism.
20. Mention any three biologically important nucleotides and write their importance.

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

- 21 i) Which of the following is a non-protein amino acid?
  - A. Proline
  - B. Histidine
  - C. Ornithine
  - D. Asparagine
- 21 ii) Transamination of oxaloacetate results in the formation of
  - A. Aspartic acid
  - B. Valine
  - C. Glycine
  - D. Serine
- 21 iii) Persons with sickle cell trait shows an increased resistance to
  - A. Typhoid
  - B. Diabetes
  - C. Malaria
  - D. Cancer
- 21 iv) Which one of the following compounds is synthesized from tryptophan?
  - A. Melanin
  - B. Serotonin
  - C. Dopamine
  - D. Epinephrine
- 21 v) Salvage pathway for purines involves the enzyme
  - A. PRPP amidotransferase
  - B. PRPP synthase
  - C. Xanthine oxidase
  - D. HGPRTase

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- 22 i) The function of restriction endonuclease enzyme is
- A. Joining DNA to cloning vector
  - B. Cleaving DNA at specific sequence
  - C. Digesting DNA from its ends
  - D. Aggregating DNA at centromere
- 22 ii) Second messenger which mobilises intracellular calcium is
- A. Phosphatidic acid
  - B. Diacylglycerol
  - C. cyclic GMP
  - D. Inositol triphosphate
- 22 iii) Biological target for attack by free radicals are all of the following **EXCEPT**
- A. Polyunsaturated fatty acids
  - B. Glucose
  - C. DNA
  - D. Protein
- 22 iv) Retinoblastoma (RB) gene is a
- A. Proto-oncogene
  - B. Oncogene
  - C. Carcinogen
  - D. Oncosuppressor gene
- 22 v) Fasting blood sample is preferred for analysis of
- A. Lipid profile
  - B. Liver function test
  - C. Renal function test
  - D. Serum electrolytes

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