

# Rajiv Gandhi University of Health Sciences, Karnataka

## MBBS Phase – I (CBME) Degree Examination - 19-Feb-2021

**Time: Three Hours****Max. Marks: 100 Marks****BIOCHEMISTRY – PAPER II (RS-4)****Q.P. CODE: 1025****(QP contains two 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 5 year old boy was brought to a Pediatrician with history of mousy odour of urine and delay in achieving cognitive functions. On examination, the boy's skin and hair was fair in colour with hypopigmentation.
  - a. What is the probable diagnosis? (1)
  - b. Name the enzyme defect in the above disorder. (1)
  - c. Write the pathway for catabolism of the above amino acid (5)
  - d. Mention the reason for the cause of mousy odour in urine (1)
  - e. What biochemical tests are done to confirm the diagnosis? (2)
2. Describe the steps of transcription in prokaryotes. Mention the inhibitors of transcription. Mention the post-transcriptional modifications. (6+1+3)

**SHORT ESSAYS****10 x 5 = 50 Marks**

3. A 8 year old girl from endemic malaria area who had splenomegaly was investigated for routine hematology, which revealed low hemoglobin of 7 gm%. Peripheral smear revealed crescent shaped RBCs. She had no history of malaria attack.
  - a. What could be the molecular defect of hemoglobin in the above case? (2)
  - b. Name the biochemical investigations which can be done to confirm the diagnosis. (2)
  - c. Reason out why these patients show resistance to malaria. (1)
4. Interpret the following Liver Function Test report:

Total Bilirubin	Direct bilirubin	Alkaline phosphatase	Ehrlich's test	Stool sample
7.7 mg/dl	3.6 mg/dl	265 IU/L	Negative	Clay colour

- a. What is the probable diagnosis? (1)
  - b. Mention the possible causes for the above condition? (2)
  - c. Substantiate with reasons for increase in conjugated fraction of bilirubin. (2)
5. Explain the steps in Polymerase Chain Reaction (PCR). Mention four applications of PCR. (3+2)
  6. Mention five tumor markers with their diagnostic importance.
  7. Explain the disorders associated with purine synthesis and breakdown.
  8. Describe the steps involved in heme degradation.
  9. List the renal function tests. Explain the principle and application of creatinine clearance. (2 +3)

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- 10 Explain structure and function relationship of protein with an example.
- 11 Explain the role of antioxidants in protection against reactive oxygen species (ROS).
- 12 Explain the immunological basis of vaccine development.

### SHORT ANSWERS

**10 x 3 = 30 Marks**

13. Explain the process of activation of proto-oncogenes to oncogenes.
14. Write the process of phase I detoxification with one example.
15. Name the polyamines and mention their clinical significance.
16. State the advantages of automation in clinical biochemistry laboratory.
17. Draw a neat labelled diagram of structure of t-RNA.
18. Mention the sources of carbon and nitrogen atoms of pyrimidine bases.
19. Mention the normal Albumin/Globulin (A/G) ratio. Give two disorders associated with altered A/G ratio. (1+2)
20. Write the characteristics of genetic code.
21. Compare and contrast between nucleosides and nucleotides.
22. What are molecular scissors? Mention its applications. (1+2)

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