Rajiv Gandhi University of Health Sciences, Karnataka

MBBS Phase – I (CBME) Degree Examination - 21-Aug-2024

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 2 day old neonate was found to have yellowish discoloration of skin. Biochemical investigation revealed: serum total bilirubin 5.5 mg/dl and serum direct bilirubin was 0.2 mg/dl.
   a) Write biological reference interval for serum total bilirubin and serum direct bilirubin.
   b) Explain the formation and fate of bilirubin.
   c) What is the biochemical basis for physiological jaundice?
   d) Write the basis of giving phototherapy in a case of physiological jaundice.
2. Describe the recombinant DNA technology and mention its applications in medicine.

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

3. A 45 year old business executive after partying in the night with alcohol and red meat got up in the morning with severe pain in the right toe. It was swollen. He rushed to a hospital and his biochemical investigations were as follows: Serum creatinine: 0.9 mg/dl and serum uric acid: 10mg/dl.
   a) Interpret serum uric acid level in this patient
   b) Explain the steps in the formation of uric acid
   c) Explain role of allopurinol in this condition
4. A 60 year old man who has a history of diabetes mellitus and hypertension, presented to Nephrology OPD with swelling in the lower limb. His serum creatinine value was 3.8 mg/dl. A diagnosis of chronic kidney disease was made.
   a) Write biological reference interval for serum creatinine.
   b) Explain creatinine clearance test.
5. Explain mechanism of action of steroid hormones.
6. Classify plasma proteins. Describe the functions of albumin.
7. Explain DNA replication in prokaryotes.
8. Explain urea cycle. Mention its regulation.
9. Describe post-transcriptional modifications of RNA.
10. Explain secondary structural organisation of protein.

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

11. Define Transamination and mention the importance of Transamination.
12. Write the characteristics of genetic code.
13. Write the role of p53 protein in cancer.
14. How is aspirin detoxified in the body?
15. Write three examples of transmethylation reactions.
16. Name three biologically important nucleotides and write their functions.
17. Enumerate three classes of immunoglobulins and write their functions.
18. Name the antioxidant enzymes and write the biochemical reaction of anyone of them.
19. Mention any three pre-analytical variables encountered in the clinical laboratory.
20. Write the reactions of purine salvage pathway.

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

21 i) The following are carcinogens **EXCEPT**
- A. Aflatoxin
- B. Gamma rays
- C. Benzopyrene
- D. Actinomycin

21 ii) The class of antibody most abundant in the serum is
- A. IgG
- B. IgM
- C. IgA
- D. IgE

21 iii) Which of the following amino acids is **not** found in proteins?
- A. Arginine
- B. Histidine
- C. Methionine
- D. Citrulline

21 iv) Which of the following is a nucleotide?
- A. Adenylic acid
- B. Adenine
- C. Adenosine
- D. Agmantine

21 v) Bilirubin is made water soluble by conjugation with
- A. Lithocholic acid
- B. Cholic acid
- C. Glucuronic acid
- D. Chenodeoxycholic acid

22 i) Serotonin is synthesized from
- A. Tyrosine
- B. Tryptophan
- C. Phenylalanine
- D. Proline

22 ii) Western blotting technique is used for the detection of
- A. DNA
- B. RNA
- C. Proteins
- D. Lipoproteins

22 iii) N_1 of pyrimidine ring is contributed by
- A. Glutamine
- B. Aspartic acid
- C. Glycine
- D. Arginine

22 iv) Which of the following cells **does not** produce **free** radicals?
- A. Erythrocytes
- B. Neutrophils
- C. Basophils
- D. Macrophages

22 v) Test used to detect urobilinogen in urine is
- A. Fouchet's test
- B. Hay's test
- C. Ehrlich's test
- D. Rothera's test

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