Rajiv Gandhi University of Health Sciences, Karnataka

MBBS Phase – I (CBME) Degree Examination - 22-Jun-2021

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

BIOCHEMISTRY – PAPER I (RS-4)

QP Code: 1024

(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 years old patient, known case of type 1 diabetes, was brought to casualty in comatose state. History revealed that he was not taking insulin regularly. Biochemical analysis of blood and urine showed the following findings.
   Blood sugar -510mg/dl
   Urine for Rothera's test and Benedict's test positive
   Blood gas analysis report showed, pH -7.2, Bicarbonate-12mEq/L,
   a. Suggest your probable diagnosis
   b. Name the compounds which give Rothera's test positive
   c. Explain the principle of Rothera's test
   d. Explain the steps of synthesis utilization of these compounds (1+1+2+6)

2. a. Which Vitamin is called as sunshine vitamin?
   b. What is its active form
   c. How it is formed?
   d. Write the biochemical functions and deficiency manifestations of this vitamin. (1+1+4+4)

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

3. Define Anaplerosis. Describe any four anaplerotic reactions of citric acid cycle intermediates. (1+4)

4. Define enzymes. Classify enzymes with one suitable reaction as an example for each class. (1+4)

5. Draw a neatly labelled diagram of the complexes of the electron transport chain. Name any two site specific inhibitors of each complex. (3+2)

6. What are dietary fibers? List any four and write their functions. (1+2+2)

7. A 13 year old girl complains of excessive tiredness, poor appetite and tingling sensation in the limbs. On examination she was pale. Laboratory report revealed Hb-7gm/dl, TIBC is increased, serum transfer in saturation is reduced and peripheral smear showed microcytic hypochromic anemia.
   a. Suggest the probable diagnosis?
   b. Describe the absorption and transport of this nutrient. (1+4)

8. Draw a neat labelled diagram of a cell with the sub cellular organelles. Write the functions of any four organelles. (3+2)

9. Write the formula to calculate anion gap; Mention its reference range. Discuss the clinical use of anion gap in classifying metabolic acidosis with two examples for each type. (1+1+3)

10. Name the urinary buffers. Explain their role in excreting excess acid from the body. Mention the other renal mechanisms of pH homeostasis. (1+2+2)

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

11. What is the end product of aerobic glycolysis? Illustrate the fate of this compound. (1+2)

12. Write the diagnostic significance of each of the following enzymes.
    a. Lipase b. Alanine amino transferase c. Creatine kinase (1+1+1)

13. Write the normal biological reference value for serum potassium. Mention any two causes of hyperkalaemia. (1+2)

14. Name any four proteins of the Extracellular Matrix. Write the Posttranslational modification of collagen and its importance. (1+2)

15. Name the mucopolysaccharide with anticoagulant activity. Write its composition and its mechanism of action. (1+1+1)

16. Define nitrogen balance. Give one example each for conditions with positive and negative nitrogen balance. (1+2)

17. Explain how long chain fatty acids are transported into the mitochondria. (3)

18. Give reason for the following
    a. Muscle glycogen doesn't contribute to blood glucose.
    b. Intake of antimalarial drugs like Primaquin in some people causes haemolytic anemia.
    c. Humans cannot synthesize vitamin C (1+1+1)

19. Which vitamin deficiency is likely to develop in patients on Isoniazid, an antitubercular drug? What is the co enzyme form of this vitamin? Write one biochemical reaction dependent on this nutrient. (1+1+1)

20. What is the sorbitol pathway? Write the significance of sorbitol pathway. (1+2)

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

21 i) Which one of the following subcellular organelle is involved in protein sorting
    a. Lysosome
    b. Golgi apparatus
    c. Peroxisomes
    d. Ribosames

21 ii) Ehlers-Danlos syndrome is due to the defective formation of -
    a. Type I Collagen
    b. Type II Collagen
    c. Type III Collagen
    d. Type IV Collagen

21 iii) Serum acid phosphatase enzyme level is increased in
    a. Hepatic disease
    b. Myocardial Infarction
    c. Muscle disease
    d. Prostate cancer

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21 iv) All are an example of Monosaccharide EXCEPT
a. Glucose
b. Galctose
c. Trehalose
d. Mannose

21 v) _____ is the nitrogen containing phospholipid
a. Phosphatidylcholine
b. Phosphatidylinositol
c. Phosphatidylglycerol
d. Diphosphatidylglycerol

22 i) The site of action of Hormone sensitive lipase is in -
a. small intestine
b. capillary walls
c. mouth
d. adipocytes

22 ii) Glucose transporter 4 is the major glucose transporter in
a. RBC
b. neurons
c. adipose tissue
d. intestine

22 iii) _____ is known to act as a physiological uncoupler
a. Valinomysin
b. Thyroxine
c. Carboxine
d. Oligomycin

22 iv) Which one of the lipoprotein fraction is elevated in hyperlipoproteinemia Type II A
a. VLDL
b. LDL
c. HDL
d. Chylomicrons

22 v) _____ is the marker of Bone formation.
a. Telopeptides
b. Tartrate resistant acid phosphatase
c. Osteocalcin
d. Pyridinium cross links derived from collagen

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