[MBBS 1123] **NOVEMBER 2023** **Sub. Code : 6055**

M.B.B.S. DEGREE EXAMINATION
(For the candidates admitted from the Academic Year 2019-2020)

FIRST YEAR – (CBME)
PAPER I – BIOCHEMISTRY
Q.P. Code: 526055

Time: 30 Minutes **Maximum : 20 Marks**

Answer All Questions

Choose one correct answer in the box provided in the Answer Script. No overwriting should be done. Choice should be given in Capital Letters.

III. Multiple Choice Questions: **(20 x 1 = 20)**

1. All of the following are trioses except:
   A) Maltotriose B) Glycerose C) Dihydroxyacetone D) Glyceraldehyde

2. The Glycosaminoglycan without uronic acid is
   A) Dermatan sulphate B) Keratan sulphate
   C) Chondroitin sulphate D) Heparan sulphate

3. A 67-year-old man suffers from congestive heart failure. He is taking digoxin, an effective inotrope, which contains a sugar component (glycol) and a nonsugar (aglycone) component. Digoxin would be best classified as which of the following?
   A) Glycoprotein B) Glycoside C) Oligosaccharide D) Thioester

4. A young infant, who was nourished with a synthetic formula, was found to have a serum and urine sugar compound that yielded a positive reducing-sugar test but was negative when measured with glucose oxidase. Treatment of the urine and serum with acid to cleave glycosidic bonds did not increase the amount of reducing sugar measured. Which of the following compounds is most likely to be present in this infant's urine and serum?
   A) Glucose B) Fructose C) Maltose D) Lactose

5. Proton pump inhibitors are a mainstay in the treatment of peptic ulcer disease and inhibit the gastric hydrogen ATPase. The hydrogen ATPase in the gastric mucosal parietal cell utilizes this energy to exchange one hydrogen ion from the cytoplasm for one extracellular potassium ion. What type of transport is this enzyme catalyzing?
   A) Antiport coupled transport B) Symport coupled transport
   C) Facilitated diffusion D) Simple diffusion

6. Allopurinol is used in the treatment of gout because of its ability to inhibit xanthine oxidase. This inhibition makes it impossible for the enzyme to degrade xanthine and hypoxanthine, which reduces the synthesis of urate, the culprit of gout. Allopurinol works through which one of the following mechanisms?
   A) Suicide inhibition
   B) Non-competitive inhibition
   C) Allosteric interaction with the enzyme that increases V_{max}
   D) Feedback inhibition

7. A 47-year-old obese man complains of having to get out of bed three times a night to urinate (polyuria), being constantly thirsty (polydipsia), and eating more often (polyphagia). The patient is diagnosed with insulin- resistant diabetes mellitus (type 2). If the patient's symptoms are due to a problem at the level of the glucose transporter, which one of the tissues indicated below will be most affected?
   A) RBCs B) Muscle C) Brain D) Liver

8. A 24-year-old woman presents with diarrhea, dysphagia, jaundice, and white transverse lines on the fingernails (Mee lines). The patient is diagnosed with arsenic poisoning, which inhibits which one of the following enzymes?
   A) Isocitrate dehydrogenase B) Pyruvate dehydrogenase
   C) Malate dehydrogenase D) Succinate dehydrogenase

9. A 3-year-old boy presents to the pediatric clinic with the symptoms of hypotonia, lactic acidosis, and seizures. After an extensive workup, he is diagnosed with PDHC deficiency, an X-linked recessive disorder. Which one of the following cofactors is not required by this enzyme to convert pyruvate to acetyl CoA?
   A) Thiamine B) Lipoic acid C) Pantothenate D) Ascorbic acid

10. Which of the following is inhibited by the carbon monoxide poisoning?
   A) Complex I of the ETC B) Cytochrome oxidase
   C) The ATP-ADP antiporter D) ATP-synthase

11. True regarding competitive inhibition of an enzyme is,
   A) Km is increased B) km is unaltered
   C) Km is decreased D) Vmax is decreased

12. All are TRUE regarding lipoprotein structure, EXCEPT :
   A) Phospholipid is present in the non-polar lipid core
   B) TAG and Cholesterol ester are present in the lipid core
   C) Cholesterol is present in the amphipathic layer
   D) Cholesterol ester is in the non-polar part

13. The rationale for the treatment of patient having gallstones with chenodeoxycholic acid is that this compound:
   A) interferes with the enterohepatic circulation
   B) inhibits cholesterol synthesis
   C) increases de novo bile acid production
   D) increases cholesterol solubility in bile

14. The following transport mechanism do not require energy except
   A) osmosis B) sodium potassium pump
   C) Simple diffusion D) facilitated diffusion

15. Glucose is trapped inside cells in the form of:
   A) β D glucopyranose B) UDP glucose
   C) Glucose 6 phosphate D) Fructose 6 phosphate

16. In anaerobic glycolysis, lactate is formed,
   A) for the generation of ATP B) for the regeneration of lactate
   C) for the regeneration of pyruvate D) for the regeneration of NAD

17. Fetal hemoglobin exhibits higher affinity for oxygen because
   A) It exhibits higher affinity for 2,3 BPG
   B) It has lower affinity for Carbon monoxide
   C) It has lower affinity for 2,3 BPG
   D) It exists in Taut structure

18. Deficiency of which vitamin causes fasting hypoglycaemia
   A) Vitamin B6 B) Vitamin B12 C) Vitamin C D) Vitamin B2

19. A patient presents in your office with very high levels of serum cholesterol. He states that he has tried to follow the diet and exercise regimen you gave him last year. You decide that this patient would benefit from a drug such as atorvastatin. This class of drugs is effective in treating hypercholesterolemia because it has what effect.
    A) Stimulates phosphorylation of the β-hydroxy-β-methylglutaryl-CoA reductase enzyme (HMG CoA reductase)
    B) Binds cholesterol preventing it from being absorbed by the intestine
    C) Directly prevents the deposition of cholesterol on artery walls
    D) Inhibits the enzyme β-hydroxy-β-methylglutaryl-CoA reductase (HMG CoA reductase)

20. Criggler Najjar syndrome type 1 is a genetic disorder associated with unconjugated hyperbilirubinemia. What enzyme deficiency is responsible for the disease?
    A) Heme oxygenase
    B) Biliverdin reductase
    C) UDP-glucuronosyltranseferase
    D) G-6 -phosphate dehydrogenase.

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