M.B.B.S. DEGREE EXAMINATION
FIRST YEAR
PAPER I – BIOCHEMISTRY

MULTIPLE CHOICE QUESTIONS

Q.P. Code: 526055

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

Answer All Questions

Write one correct answer in the box provided in the Answer Script. No overwriting should be done.

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

1. The marker enzyme of lysosome is

   A) Lactate dehydrogenase.
   B) Cathepsin.
   C) Galactosyl transferase.
   D) Glucose - 6 - phosphatase.

2. One of the following is a lysosomal disorder

   A) Inclusion cell disease.
   B) Cystic Fibrosis.
   C) Alport's syndrome.
   D) Prions disease.

3. What is the biochemical basis for using sodium fluoride while collecting sample for glucose estimation?

   A) For inhibiting glycolysis.
   B) For better separation of serum.
   C) For better separation of plasma.
   D) For better estimation of cholesterol.

4. A three-month-old child exclusively on breast feeds presented with incessant crying, poor weight gain. Clinical examination revealed enlarged liver, cataract and positive benedict's test of the urine. The most likely condition is

   A) Von Gierke's Disease.
   B) McArdle's Disease.
   C) Galactosemia.
   D) Lactose intolerance.

5. Which of the following is derived lipid?

   A) Triacyl glycerol.
   B) Plasmalogen.
   C) Prostaglandin.
   D) Ganglioside.

6. The major apolipoprotein seen in chylomicron is

A) Apo B_{48}.
B) Apo B_{100}
C) Apo AI
D) Apo AII

7. One of the following enzyme is not a protein

A) Lactase
B) Hydrolase
C) Ribozyme
D) Ligase

8. To which class of enzymes is aldolase classified

A) Oxidoreductase.
B) Isomerase.
C) Lyase
D) Ligase

9. Which Vitamin is excreted as oxalic acid?

A) Retinoic Acid
B) Ascorbic Acid
C) Folic Acid
D) Pantothenic Acid

10. The Vitamin required for the synthesis of catecholamines is

A) Vitamin K
B) Vitamin B_{12}
C) Vitamin C
D) Vitamin B6

11. Which of the following is an uncoupler of oxidative phosphorylation?

A) Carbon Monoxide.
B) Cyanide.
C) Oligomycin.
D) 2,4 Dinitrophenol.

12. Physiological uncoupler of oxidative phosphorlyation is one of the following

A) Thyroxine
B) Tyrosin
C) Vascomycin
D) Carboxin

13. Citric acid cycle is otherwise called as Amphibolic cycle because it has both

A) Anabolic and catabolic
B) Mitochondrial and cytoplasmic
C) Reversible and irreversible
D) Protein and lipid substrates

14. Total number of ATP's generated in one cycle of citric acid cycle is

A) 8
B) 10
C) 16
D) 14

15. Which of the following causes negative nitrogen balance?

A) Growth hormone
B) Insulin
C) Corticosteroid
D) Androgen

16. Factors affecting basal metabolic rate are all of the following EXCEPT

A) Temperature
B) Exercise
C) Fever
D) Glucagon

17. Which of the following amino acid is required for synthesis of heme?

A) Lysine
B) Cysteine
C) Phenylalanine
D) Glycine

18. Sickle cell anemia is characterized by the following EXCEPT

A) Homozygous Recessive Inheritance
B) Chronic hemolytic anemia, episodes of pain hyperbilirubinemia.
C) Polymerization of deoxyhemoglobin and under hypoxia.
D) Valine in position six of beta chain replaced by glutamate.

19. Factors affecting the fluidity of the cell membrane are all of the following EXCEPT

A) Trans fatty acids
B) Cholesterol
C) Tight junction
D) Transition temperature

20. Impaired functions of aquaporins leads to

A) Diabetes Mellitus
B) Cirrhosis
C) Nephrogenic Diabetes Insipidus
D) Hartnup's Disease

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M.B.B.S. DEGREE EXAMINATION
FIRST YEAR
PAPER I – BIOCHEMISTRY

MULTIPLE CHOICE QUESTIONS

Q.P. Code: 526055

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

Answer All Questions

Write one correct answer in the box provided in the Answer Script. No overwriting should be done.

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

1. Cystic Fibrosis is due to the defect in the transport of

A) Copper ions.
B) Chloride ions.
C) Cysteine.
D) Potassium ions.

2. The predominant cation of intracellular fluid compartment is

A) Potassium.
B) Sodium.
C) Calcium.
D) Magnesium.

3. Which of the following is not a reducing sugar?

A) Glucose.
B) Fructose.
C) Lactose.
D) Sucrose.

4. Anderson's glycogen storage disease is caused by deficiency of

A) Branching Enzyme.
B) Debranching Enzyme.
C) Muscle Phosphorylase.
D) Liver Phosphorylase.

5. The following are lipotropic factor EXCEPT

A) Choline.
B) Lecithin.
C) Methionine.
D) Sphingomyelin.

6. The regulatory enzyme of cholesterol biosynthesis is

A) HMG-Co-A Synthase.
B) Aceto Acetyl-Co-A Synthase.
C) HMG-Co-A Reductase.
D) Mevalonate Kinase.

7. Following are the factors affecting enzyme activity EXCEPT

A) Temperature.
B) pH.
C) Substrate concentration.
D) Active site of the Enzyme.

8. Which metalloenzyme contains copper?

A) Alcohol Dehydrogenase.
B) Hexokinase.
C) Tyrosinase.
D) Lipase.

9. Which hypervitaminosis causes histamine release and itching?

A) Thiamine.
B) Riboflavin.
C) Niacin.
D) Biotin.

10. Which vitamin plays a role in regulation of gene expression and tissue differentiation?

A) Vitamin – E.
B) Vitamin – K.
C) Vitamin – D.
D) Vitamin – A.

11. All of the following diseases are transmitted maternally EXCEPT

A) Mitochondrial encephalopathy, lactic acidosis stroke like episodes (MELAS).
B) Lebers Hereditary Optic Neuropathy.
C) Myoclonic Epilepsy.
D) Hemophilia.

12. Iron-sulfur proteins are found in

A) Complex IV and V.
B) Mitochondrial outer membrane.
C) Complex I and II.
D) Ubiquinone.

13. The Biologic effect of glucagon over metabolism include all of the following EXCEPT

A) Increased Glycogenolysis.
B) Increased Ketogenesis.
C) Increased Glycogenesis.
D) Increased Gluconeogenesis.

14. Which of the following enzyme is inhibited by fluoroacetate?

A) Fumarase.
B) Succinate Thiokinase.
C) Aconitase.
D) Citrate Synthase.

15. Value of specific dynamic action of carbohydrate is

A) 25%.
B) 5%.
C) 30%.
D) 15%.

16. Negative nitrogen balance is associated with following situations EXCEPT

A) Lack of an essential Amino Acid.
B) Inadequate Dietary Protein.
C) Burns.
D) Recovery from Acute illness.

17. The following are congenital hyper bilirubinemia's EXCEPT

A) Dubin-Johnson Syndrome.
B) Turner's Syndrome.
C) Gilbert's Syndrome.
D) Rotor Syndrome.

18. Which of the following intermediate of citric acid cycle is the precursor of haem synthesis?

A) Acetyl CoA.
B) Glutatryl CoA.
C) Succinyl CoA.
D) Isocitrate.

19. In porphyria cutanea tarda, the enzyme that is affected is

A) Uroporphyrinogen III Cosynthase.
B) Uroporphyrinogen Decarboxylase.
C) Uroporphyrinogen – I Synthase.
D) Coproporphyrinogen Oxidase.

20. Which vitamin deficiency causes homocysteinemia?

A) Thiamin
B) Niacin.
C) Folate.
D) Biotin.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[MBBS 0222] FEBRUARY 2022 **Sub.Code : 6055**

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

PAPER I – BIOCHEMISTRY

MULTIPLE CHOICE QUESTIONS

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.

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

1. Which of the following is a lipotropic factor?
   A. Sphingomyelin.
   B. Choline.
   C. Cardiolipin.
   D. Orotic acid.

2. Co enzyme A is derived from which of the following Vitamin ?
   A. Niacin.
   B. Biotin.
   C. Pantothenic acid.
   D. Cobalamin.

3. Pernicious anemia may result due to the dietary deficiency of which of the following vitamin ?
   A. Folic acid.
   B. Pyridoxine.
   C. Pantothenic acid.
   D. Cobalamin.

4. In premature newborns, the deficiency of which lipid is associated with respiratory distress syndrome
   A. Phosphatidyl choline.
   B. Phosphatidyl ethanolamine.
   C. Phosphatidyl inositol.
   D. Phosphatidyl glycerol.

5. Aspirin inhibits the activity of the enzyme
   A. Lipoxygenase
   B. Cyclooxygenase
   C. Phospholipase A1
   D. Phospholipase A2

6. Pulses are deficient in
   A. Lysine
   B. Threonine
   C. Methionine
   D. Tryptophan

7. Niemann-pick disease is due to defect in the which enzyme ?
   A. Beta-glucosidase
   B. Sphingomyelinase
   C. Beta-galactosidase
   D. Hexosaminidase A

8. Normal plasma cholesterol level is
   A. 40 – 60 mg/100 ml.
   B. 70 – 110 mg/100 ml.
   C. 120 – 150 mg/100 ml.
   D. 150 – 200 mg/100 ml.

9. The following vitamins has antioxidant property except
   A. Vitamin C.
   B. Vitamin E.
   C. Vitamin A.
   D. Vitamin K.

10. All of the following are substrates for gluconeogenesis except
   A. Alanine.
   B. Leucine.
   C. Glycerol.
   D. Methionie.

11. In TCA cycle, substrate level phosphorylation takes place in
   A. Alpha ketoglutarate to succinyl CoA.
   B. Succinyl CoA to succinate.
   C. Succinate to fumarate.
   D. Oxaloacetate to citrate.

12. Renal threshold for glucose is
   A. 80 mg %
   B. 120 mg %
   C. 180 mg %
   D. 200 mg %

13. The product of oxidation of odd chain fatty acids is
   A. Aceto Acetyl CoA
   B. Malonyl CoA
   C. Propionyl CoA
   D. Fumaryl CoA

14. Rate limiting step in Cholesterol synthesis is
    A. HMG CoA synthase.
    B. HMG CoA lyase.
    C. HMG CoA reductase.
    D. Squalene synthase.

15. NADPH is required for
    A. Gluconeogenesis.
    B. HMP Shunt.
    C. Glycolysis.
    D. Fatty acid Synthesis.

16. Glycogen synthesis is increased by
    A. Cortisone.
    B. Insulin.
    C. Glucagon.
    D. Epinephrine.

17. An example of competitive inhibition of an enzyme is
    A. Succinate dehydrogenase by malonate.
    B. Cytochrome oxidase by cyanide.
    C. Hexokinase by glucose-6-phosphate.
    D. Phosphofructokinase by citrate.

18. In a cell, digestive enzymes mostly occurs in
    A. Mitochondria.
    B. Lysosomes.
    C. Ribosome.
    D. Golgi apparatus.

19. Net yield of ATP from one molecule of palmitic acid is
    A. 8 ATP
    B. 32 ATP
    C. 38 ATP
    D. 106 ATP

20. Which factor decreases the affinity of hemoglobin for oxygen binding ?
    A. An increase in 2,3 BPG level in blood
    B. A rise in pH
    C. Oxidation of iron to ferric state in one subunit
    D. Vomiting

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[MBBS 0522] **MAY 2022** **Sub.Code : 6055**

M.B.B.S. DEGREE EXAMINATION

(For the candidates admitted from the Academic Year 2019-2020)

FIRST YEAR – SUPPLEMENTARY (CBME)

PAPER I – BIOCHEMISTRY

MULTIPLE CHOICE QUESTIONS

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.

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

1. Which of the following tissues can not utilise ketone bodies?

   A. Renal Cortex.
   B. Erythrocytes.
   C. Brain.
   D. Skeletal Muscle.

2. Burning foot syndrome is due to deficiency of which of the following vitamin

   A. Riboflavin.
   B. Niacin.
   C. Pantothenic acid.
   D. Thiamin.

3. Classic Galactosemia due to deficiency of which enzyme ?

   A. Galactokinase.
   B. Galactose – 1 – phosphate uridyltransferase.
   C. Aldose reductase.
   D. UDP Hexose-4-epimerase.

4. Essential pentosuria due to deficiency of which enzyme?

   A. UDP – Glucose dehydrogenase.
   B. Glucose-6-phosphate dehydrogenase.
   C. Xylulose reductase.
   D. Gulonolactone oxidase.

5. Which of the following is an Insulin dependent transporter

   A. Glut 1
   B. Glut 2
   C. Glut 3
   D. Glut 4

6. Which of the following is a Non Reducing sugar?

   A. Maltose.
   B. Lactose.
   C. Cellobiose.
   D. Sucrose.

7. HMG CoA reductase is inhibited by

   A. Clofibrate.
   B. Gemfibrosyl.
   C. Lovastatin.
   D. Cholestyramine.

8. Calories generated per gram of fat is

   A. 4 K Cal.
   B. 5 K Cal.
   C. 8 K Cal.
   D. 9 K Cal.

9. Congenital Erythropoietic porphyria is caused by deficiency of

   A. ALA Synthase.
   B. Uroporphyrinogen III Co synthase.
   C. Coproporphyrinogen oxidase.
   D. Uroporphyrinogen decarboxylase.

10. Daily requirement of Vitamin B1 (Thiamine) for a normal healthy adult is

    A. 1 microgram.
    B. 5 microgram.
    C. 100 microgram.
    D. 1 milligram.

11. All the compounds act as antivitamins except
    A. Avidin.
    B. Menadione.
    C. INH.
    D. Methotrexate.

12. Which enzyme is useful in treating myocardial infarction?

    A. Pepsin
    B. Trypsin
    C. Asparaginase
    D. Streptokinase

13. What is the enzyme used in diagnostic technique of ELISA?

    A. Restriction endonuclease.
    B. Horse radish peroxidise.
    C. Reverse transcriptase.
    D. Urokinase.

14. The glycosaminoglycans that serves as an anticoagulant

A. Heparin.
B. Hyaluronic acid.
C. Chondroitin sulphate.
D. Dermatan sulphate.

15. In humans, a dietary essential fatty acid is

A. Palmitic acid.
B. Stearic acid.
C. Oleic acid.
D. Linoleic acid.

16. Dietary fats after absorption appear in the circulation as
A. HDL.
B. VLDL.
C. LDL.
D. Chylomicron.

17. According to MICHAELIS-MENTEN equation Km of an enzyme

A. Is substrate concentration at maximal rate.
B. Is substrate concentration at half maximal rate.
C. Enzyme concentration at maximum rate.
D. Enzyme concentration at half minimum rate.

18. Which of the following mineral is required by glutathione peroxidase

A. Magnesium.
B. Copper.
C. Iron.
D. Selenium.

19. In liver, the conjugation of bilirubin is catalysed by which of the following enzyme ?

A. Ferrochelatase.
B. UDP – glucuronyltransferase.
C. Pyruvate carboxylase.
D. Beta – glucuronidase.

20. Human insulin differs from bovine insulin in

A. Biological activity.
B. Number of amino acids.
C. Position of disulphide bonds.
D. Sequence of amino acids.

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[MBBS 0522]

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[MBBS 0123] **JANUARY 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. Two sugars which differ from one another only in configuration around a single carbon atom are termed
   A) Anomers B) Epimers C) Optical isomers D) Stereoisomers

2. A 25 year old man presents with diarrhea, bloating, flatulence and frothy stools after consumption of milk and dairy products. Mention the enzyme deficient in this individual
   A) Galactose-1-phosphate uridyl transferase B) Fructokinase
   C) Aldolase B D) Lactase

3. All of the following are branched except
   A) Amylopectin B) Starch C) Amylose D) Glycogen

4. Which of the following is not a lipid?
   A) Glycerol B) Palmitic acid C) Triacylglycerol D) Cholesterol

5. An infant, born at 28 weeks of gestation, rapidly gave evidence of respiratory distress. Lab and x-ray results supported the diagnosis of infant respiratory distress syndrome (RDS). Which of the following compound is the lung surfactant?
   A) Dipalmitoyl Phosphatidyl Choline B) Phosphatidyl serine
   C) Phosphatidyl ethanolamine D) Phosphatidyl inositol

6. Which type of fatty acid is arachidonic acid?
   A) 20:ω6 B) 20:ω3 C) 18:ω6 D) 22:ω3

7. A postoperative patient on intravenous fluids develops lesions in the mouth (angular stomatitis). His Riboflavin level is found to be abnormally low. Which of the following TCA cycle enzymes is most likely to be affected?
   A) Citrate synthase B) Isocitrate dehydrogenase
   C) Malate dehydrogenase D) Succinate dehydrogenase

8. Chylomicron transports triacylglycerol from intestine to:
   A) Liver B) Kidney C) Extrahepatic tissues D) Brain

9. The apoprotein present in nascent chylomicron is:
   A) apo B100 B) apo B48 C) apo CII D) apo E

10. Coenzymes of PDH complex are all except:
    A) TPP B) Biotin C) FAD D) NAD

11. All the following causes shift of oxyhemoglobin dissociation curve to right except
    A) Alkalosis B) 2, 3 BPG C) Hypoxia D) Anemia

12. A newborn is found to have fasting hypoglycemia. The nursery staff begins overnight feeds by nasogastric tube because they find that the child has consistently low blood sugars. A liver biopsy and molecular studies demonstrate an absence of glycogen synthase. The normal function of this enzyme is to do which of the following?
    A) Remove glucose residues one at a time from glycogen in the liver.
    B) Transfer glucose from UDP-glucose to the non-reducing end of a glycogen primer.
    C) Hydrolyze α--1, 6 bonds of glycogen.
    D) Function as a glucosyl 4:6 transferase.

13. Propionic acid accumulation from amino acid degradation will result from a deficiency of which one of the following vitamins?
    A) Vitamin B_6 B) Biotin C) Folic acid D) Vitamin B_1

14. The storage form of vitamin A in mammals is
    A) Retinyl esters B) Retinoic acid C) Retinal D) Beta carotene

15. A muscular 25-year-old man presents with dermatitis and an inflamed tongue. A history reveals that he has been consuming raw eggs as part of his training regimen for the past 6 months. Which of the following vitamins is most likely to be deficient in this patient?
    A) Biotin B) Cobalamin (vitamin B_{12})
    C) Folic acid D) Niacin (vitamin B_3)

16. Which one of the following is characteristic of low insulin levels?
    A) Increased glycogen synthesis
    B) Decreased gluconeogenesis from lactate
    C) Decreased glycogenolysis.
    D) Increased formation of Beta-hydroxybutyrate

17. A deficiency in thiamine (vitamin B_1) would most likely lead to which of the following clinical manifestations?
    A) Decrease in carboxylase enzyme activity
    B) Decrease in serum lactate concentrations
    C) Decrease in red blood cell transketolase activity
    D) Increase in urinary methylmalonate

18. The genetic disease which results from a mutation in the gene coding for the enzyme β-hexosaminidase A is called:
    A) Huntington disease B) Lesch-Nyhan syndrome
    C) Tay-Sachs disease D) Amyotrophic lateral sclerosis

19. A patient with hereditary type 1 hyperlipidemia presents with elevated levels of chylomicrons and VLDL triglycerides in the blood. The main function of the chylomicrons in circulation is to do which of the following?
    A) Transport lipids from the liver
    B) Transport dietary lipids from the intestine to target tissues
    C) Transport cholesterol from IDL to LDL
    D) Act as a receptor for triacylglycerols in the liver

20. You decide to treat a patient who has very high levels of serum cholesterol with the statin drug atorvastatin. You know that this drug acts in the metabolic pathway leading to the synthesis of cholesterol. The substrate for the enzyme inhibited by the statin drugs is which of the following?
    A) Acetoacetyl-CoA B) HMG-CoA
    C) Isopentenyl pyrophosphate D) Mevalonate.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[MBBS 0323] **MARCH 2023** **Sub. Code : 6055**

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

FIRST YEAR – SUPPLEMENTARY (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 aldoses except:
   A) Glucose B) Ribose C) Galactose D) Ribulose

2. The Glycosaminoglycan without any sulphate conjugation is
   A) Dermatan sulphate B) Keratan sulphate C) Hyaluronic acid D) Heparin

3. Dipalmitoyl Phosphatidyl choline is an example of
   A) Lecithin B) Plasmalogen C) Cardiolipin D) Cephalin

4. The marker enzyme of lysosome is
   A) Lactate dehydrogenase B) Cathepsin
   C) Galactosyl transferase D) Glucose - 6 – phosphatase

5. A three-month-old child exclusively on breast feeds presented with incessant crying, poor weight gain. Clinical examination revealed enlarged liver, cataract and positive Benedict's test of the urine. The most likely condition is
   A) Von Gierke's Disease B) McArdle's Disease
   C) Galactosemia D) Lactose intolerance

6. The apoprotein which activates Lipoprotein lipase is:
   A) Apo B48 B) Apo B100 C) Apo CII D) Apo A1

7. True regarding chylomicron are all except:
   A) HDL is involved in activation of chylomicron
   B) Lipoprotein Lipase helps in the conversion of chylomicron to chylomicron remnant
   C) Chylomicron remnant reaches the extrahepatic tissues
   D) Chylomicron reaches the extrahepatic tissues

8. A 15 year old child presents with repeated episode of pancreatitis. Serum triglyceride concentration is 1100mg/dL, Cholesterol is 250mg/dL. Lipoprotein lipase activity is low. The diagnosis is:
   A) Type I hyperlipoproteinemia B) Type II hyperlipoproteinemia
   C) Type III hyperlipoproteinemia D) Type IV hyperlipoproteinemia

9. The mucopolysaccharide present in the glomerular basement membrane is:
   A) Heparan sulphate B) Keratan sulphate
   C) Hyaluronic acid D) Chondroitin sulphate

10. All of the following cells are dependent on glycolysis except?
    A) Neurons B) RBC C) Renal medulla D) Red muscle fibres

11. Glucose enters into skeletal muscle by:
    A) Simple passive diffusion B) Facilitated passive diffusion
    C) Primary active transport D) Secondary active transport

12. The significance of Rappaport Leubering Shunt is:
    A) ATP production B) Lactate formation
    C) Source of fatty acid D) 2, 3 BPG production

13. All the following causes shift of oxyhemoglobin dissociation curve to right except
    A) Increase in body temperature B) 2, 3 BPG
    C) Alkalosis D) Acclimatisation

14. A mutation in complex II of the ETC will cause impairment of electron transfer from which of the following substrates?
    A) α-Ketoglutarate B) Isocitrate C) Succinate D) Pyruvate

15. Which one of the following statements concerning vitamin B12 is correct?
    A) The cofactor form is vitamin B12 itself
    B) It is involved in the transfer of amino groups
    C) It requires a specific glycoprotein for its absorption
    D) It is present in plant products

16. A 30-year-old man goes to his dentist complaining of loosening teeth. Examination also reveals his gums are swollen, purple, spongy and multiple splinter haemorrhages near the distal ends of the finger nails and that a wound on the patient's forearm has failed to heal properly. Which of the following vitamins is most likely to be deficient in this patient?
    A) Ascorbic acid (vitamin C) B) Biotin
    C) Cobalamin (vitamin B_{12}) D) Riboflavin (vitamin B_2)

17. Prior to a race, many marathon runners will try to increase their glycogen concentrations by loading up with foods with high starch content, such as pasta. α- Amylase secreted by the pancreas will digest the starch into which of the following major products?
    A) Amylose, amylopectin, and maltose B) Glucose, galactose, and fructose
    C) Limit dextrins, maltose, and maltotriose D) Limit dextrins, lactose, and sucrose

18. Enzymes act by reducing the
    A) Activation energy B) Binding energy C) Heat energy D) All the above

19. Iron sulphur proteins are components of
    A) Citric acid cycle B) ATP synthase C) Beta- oxidation D) Respiratory chain

20. Tay-Sachs disease involves the metabolism of gangliosides. Gangliosides are composed of a ceramide backbone with at least which one of the following?
    A) Phosphorylated sugar residue B) Glucose residue
    C) Galactose residue D) Sialic acid residue.

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THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[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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[MBBS 1123]

THE TAMIL NADU DR. M.G.R. MEDICAL UNIVERSITY

[MBBS 0124] JANUARY 2024 Sub. Code : 6055

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

FIRST YEAR – SUPPLEMENTARY (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 storage form of vitamin A in mammals is
   A) Retinol B) Retinoic acid C) Retinal D) Beta carotene

3. Marilyn Manroe, the famous American model, actress and singer was suffering from insomnia. Her friend introduced her to a street drug "Lilly 33s.", which is amobarbital!! She died at the age of 36, following intake of few "Lillies"!! Amobarbital acts by inhibiting electron transport from
   A) Complex I to Q B) Complex II to Q
   C) Complex III to Q D) Complex IV to Oxygen

4. CPTI is activated by all, EXCEPT:
   A) Acyl CoA B) Malonyl CoA
   C) High ADP/ATP ratio D) Glucagon

5. Liver cannot utilize ketone bodies because of lack of:
   A) Thiolase B) Thioesterase
   C) Thiophorase D) Aconitase

6. All of the following cells are dependent on glycolysis except
   A) Neurons B) RBC C) Renal medulla D) Red muscle fibres

7. A neonate presented with hemolytic anemia. Peripheral smear revealed that it's case of non-spherocytic hemolytic anemia. Pyruvate kinase activity was remarkably low (0.675 U/g Hb). Which of the following explains haemolytic anaemia in this condition?
   A) Low 2,3 BPG production B) High 2,3 BPG production
   C) High ATP production D) Failure of Sodium Potassium ATPase pump

8. Coenzymes of PDH complex are all except
   A) TPP B) Biotin C) FAD D) NAD

9. ALA synthase is an example of
   A) Lyase B) Ligase C) Transferase D) Hydrolase

10. A breast fed infant begins to vomit frequently and lose weight. Several days later she is jaundiced, her liver is enlarged and cataracts are noticed in her lenses. She is diagnosed with classical galactosemia. The enzyme responsible for cataract in this condition is?
    A) Galactose 1 phosphate uridyl transferase B) Lactase
    C) Aldose reductase D) Aldolase B

11. The mucopolysaccharide with galactose instead of uronic acid is
    A) Hyaluronic acid B) Heparin C) Heparan sulphate D) Keratan sulphate

12. A premature child presents with Infant Respiratory Distress Syndrome. The neonatologist says the neonate is yet to produce lecithin adequately. All of the following are components of lecithin except
    A) Glycerol B) Choline C) Phosphatidate D) Ceramide

13. The inner non polar lipid core of Chylomicron is made up of
    A) Phospholipid B) Monoacyl glycerol
    C) Diacyl glycerol D) Cholesterol ester

14. Arachidonic acid is a fatty acid of which type?
    A) 20:ω6 B) 20:ω3 C) 18:ω6 D) 22:ω3

15. Glucagon stimulates:
    A) Liver glycogen phosphorylase B) Muscle glycogen phosphorylase
    C) Glucokinase D) Hexokinase

16. Which of the following is true about uncompetitive inhibition of an enzyme?
    A) Increases Km B) Low Vmax
    C) High Vmax D) Normal Km

17. Thiamine deficiency is diagnosed by the estimation of
    A) RBC transketolase B) RBC NAD concentration
    C) RBC Glutathione peroxidise D) RBC Glutathione reductase

18. The enzyme marker for peroxisome is
    A) Catalase B) Perioxidase
    C) Glucose 6 phosphatase D) Hexokinase

19. Number of ATPs produced by complete oxidation of stearic acid is
    A) 102 B) 120 C) 106 D) 160

20. Fatty acid oxidation happens in:
    A) Cytoplasm B) Mitochondria
    C) Endoplasmic reticulum D) Nucleus

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[MBBS 0124]