



مقدم من فريق أفق الطبي



MCQ.H

1. net result of an aerobic glycolysis one mole of glucose is

- a) 2 pyruvic acid + 2NADH + 2 ATP
- b) 2 pyruvic acid + 2 NADPH + 2 ATP
- c) 2 lactic acid + 2 NADH + 2ATP
- d) 2 lactic acid + 2 ATP

2. Aerobic glycolysis one mole of glucose is give

- a) 2 moles pyruvate + 2 ATP + 2FADH
- b) 2 moles lactate + 2 ATP
- c) 2 moles pyruvate + 2 ATP + 2 NADPH
- d) 2 ATP + 2 pyruvate + 2 NADH

3. Fumarase catalyzes the formation of which product

- a) succinate
- b) Succinyl CoA
- c) Oxalo acetate
- d) Malate

4. For gluconeogenesis one mole of glucose will need

- a) 2 NADH + 4 ATP+2 pyruvic + 2 GTP
- b) 2 FADH+ 2 NADH +1 GTP + 2 pyruvic
- c) 2 NADPH + 2 FAD +1 ATP +2 pyruvic
- d) Nne of the Above

5. in glycolysis, which enzyme catalyses the rate limiting step

- a) glucokinase
- b) PFK
- c) pyruvate kinase
- d) enlase

6. D-amino acids are found in all the following tissues (EXCEPT)

- a) Hemoglobin B-chain
- b) Plants
- c) Bacterial cell walls
- d) Antibiotics

7. All the following about HbA1c are true EXCEPT

- a) concentration of (HbA1c) reflects average blood glucose for the last 2 months
- b) glycated Hb (HbA1c) is combination of glucose and B-globine chains
- c) the binding between glucose and hemoglobin is irreversible
- d) reaction is non-enzymatic and slow

8. All the following about G6PD deficiency are true EXCEPT

- a) Hemolytic anemia and jaundice will occur after oxidative stressor action
- b) The G6PDH gene is located on the X chromosome of the man and woman
- c) chemical like naphthalene and antifungal drugs should be avoided
- d) There is an impairment in the production of FADPH as a source of energy

9. Gluconeogenesis

- a) Is the formation of glucose from non-carbohydrate source, and takes place in liver mitochondria in fasting and low insulin levels
- b) Is the formation of glucose from non-carbohydrate source and takes place in cytosol in fasting and low Tinsulin level
- c) Is the formation of glucose from non-carbohydrate source, and takes place in liver cytosol and mitochondria after carbohydrate meal
- d) Is the formation of glucose from non-carbohydrate source and takes place in liver cytosol and mitochondria

10. In the presence of pyridoxal phosphate dependent dehydratase serine will give

- a) keto butyric acid +NH₃+H₂S
- b) keto butyric acid +NH₃+H₂O
- c) Pyruvic acid NH₃+H₂S
- d) Pyruvic acid + NH₃+H₂O

11. All the following about glucagon are true EXCEPT

- a) It activates glycogen synthase phosphatase
- b) It activates glycogen synthase kinase
- c) It activates pyruvate dehydrogenase kinase
- d) It activates adenyl cyclas

12. About Nitrogen balance (Nitrogen equilibrium)

- a) it is associated in growing children and lactating women
- b) it is associated in healthy adults where nitrogen loss and nitrogen intake are even
- c) it is associated in people suffering from burns and ulcers
- d) it is associated in cases of illness and malnutrition

13. About Nitrogen balance (Nitrogen equilibrium)

- a) it is associated in cases of illness and malnutrition
- b) it is associated in growing children and lactating women
- c) it is associated in healthy adults having balanced meals
- d) it is associated in people suffering from burns and ulcer

14. Glucagon inactivates all the following enzymes (EXCEPT)

- a) Acetyl CoA carboxylase
- b) pyruvic dehydrogenase
- c) Adenylate cyclase
- d) Phosphofructokinase

15. Dopamine has all the following functions (EXCEPT)

- a) Inhibitory neurotransmitter
- b) precursor of epinephrine and melanin biosynthesis
- c) Potent vasoconstrictor
- d) Administered to patients suffering from Parkinson's disease

16. All the following are cytoplasmic enzymes of hepatocyte (EXCEPT)

- a) Carbamyl phosphate synthase
- b) Arginosuccinase
- c) arginosuccinate synthase
- d) arginase

17. MCADD is associated with all the following (EXCEPT)

- a) decrease in fatty acid oxidation having 10-12 carbons due to inborn error
- b) It causes serious problems after having a meal rich in protein and fat
- c) Under conditions of health, it may not lead to significant problems if they do not fast for long time
- d) It may lead to fatty acid build up, hyperglycemia, hyperammonemia and possibly death

18. arginine amino acid is considered essential , amino acid for

- a) vegetarians
- b) lactating mother
- c) pregnant woman
- d) infant's growth

19. All the following can cause negative nitrogen balance EXCEPT

- a) gastrointestinal disease
- b) diet limited to one kind of plant source proteins
- c) malnutrition
- d) lactation and eating inadequate diet

20. All the following enzymes are found in the mitochondria (EXCEPT)

- a) Enol CoA hydratase
- b) Acyl CoA dehydrogenase
- c) ATP dependent citric acid lyase
- d) B-Ketothiolase

21. ketolysis is

- a) utilization of keton bodies in RBCs and liver only in case of severe dieting
- b) is the utilization of ketone bodies in all extra hepatic tissues except brain
- c) utilization of keton bodies in mitochondrial matrix of extra hepatic tissues
- d) is the utilization of ketone bodies by kidney, liver, and brain in fasting

22. oxidation of one mole of succinyl CoA in skeletal muscles will give

- a) 7 ATP + 1 GTP + one fumarate
- b) 6 ATP + 1 GTP + one oxalo acetate
- c) NADH + 1 FADH +1 GTP+ one oxalo 1 acetate
- d) None of the above

23. After a carbohydrate meal all the following are true EXCEPT

- a) decrease in production of cyclic AMP
- b) Insulin/glucagon ratio is high and glycogenesis is high
- c) Insulin/glucagon ratio is high and gluconeogenesis is low
- d) Insulin/glucagon ratio is high and gluconeogenesis is high

24. The most initial source of glucose during fasting is

- a) Adipocytes Triglycerides
- b) Liver glycogen
- c) Liver triglycerides
- d) Muscles glycogen

25. All the following are associated with atherosclerosis EXCEPT

- a) Elevated serum cholesterol ester
- b) Elevated serum cholesterol
- c) Elevated serum triglycerides
- d) Elevated HDL

26. Hydroxytryptamin serotonin is

- a) Neurotransmitter
- b) inhibitory neurotransmitter
- c) A vasoconstrictor
- d) A vasodialator

27. Elevation of AST (SGOT) is associated with

- a) Polyneuropathy
- b) Myocardial infarction
- c) Osteoblastic bone diseases
- d) Biliary obstruction

28. Insulin activates all the following enzymes (EXCEPT)

- a) Glycogen synthase
- b) Citrate synthase
- c) ATP depends Citrate lyase
- d) Glycogen phosphorylase

29. For the synthesis of one mole of stearic acid (18 carbons) you need

- a) Acetyl CoA + 7 MalonylCoA + 14 NADPH
- b) Acetyl CoA + 9 MalonylCoA + 14 NADPH
- c) acetyl CoA + 8 MalonylCoA + 16 NADPH
- d) Acetyl CoA + 7 MalonylCoA + 12 NADPH

30. All the following enzymes are mitochondrial enzymes except

- a) Succinate thiokinase
- b) Pyruvate carboxylase
- c) Malate dehydrogenase
- d) Phosphoenol pyruvate carboxy kinase (PEPCK)

31. Major amount of Cholesterol is synthesized

- a) in In the cytosol of all skin and intestine cells
- b) In the cytosol of liver cells
- c) In the matrix of liver mitochondria
- d) In the mitochondria of skin and intestine cells

32. All the following are true about secondary diabetes (EXCEPT)

- a) It might be due to pancreatic failure resulted from chronic pancreatitis
- b) it might be drug induced (glucocorticoid)
- c) it might be due to hormone induced (eg growth hormone) insulin resistance
- d) The case will be improved by regular exercise

33. How many moles of ATP will be produced from .the oxidation of 85.5 gm lactose in the liver

- a) ATP 36
- b) ATP 18
- c) ATP 38
- d) ATP 19

34. Ammonia from brain and other tissues is transported to the liver as

- a) Asparagin
- b) Alanine
- c) Glutamine
- d) lysine

35. Which enzyme is deficient in Alkaptonuria :

- a) (AKU) phenyl alanine hydroxylase
- b) Tyrosine transaminase
- c) hydroxy phenyl pyruvic acid oxidase
- d) Homogentisic acid oxidase

36. The cost of formation of one glucose in gluconeogenesis pathway is

- a) 2 alanine + 4 ATP+2 GTP+2 NADH
- b) 2 pyruvate +4ATP+2 GTP +2 FADH
- c) 2 alanine + 4 ATP+2 GTP+NADPH
- d) 2 pyruvate +4ATP+2 TTP +2 FADH

37. glucagon is a hyperglycemic hormone, and-it acts by

- a) increases the uptake of glucose by tissues
- b) Stimulates the oxidation of glucose by tissues
- c) stimulates glycogenesis and lipogenesis
- d) stimulates glycogenolysis and lipolysis

38. Histamine has the following functions (EXCEPT)

- a) Inhibitory neurotransmitter
- b) Stimulates secretion of pepsin and acid in the stomach
- c) Released in localized areas of inflammation
- d) Vasodilator

39. All the following amino acids are glucogenic EXCEPT

- a) Lysine
- b) Alanine
- c) Valine
- d) tyrosine

40. All the following about adenylyl cyclase are correct except

- a) It activates glycogen synthase kinase
- b) It downregulates Glycogen synthase
- c) It activates glycogen synthase phosphatase
- d) It is activated by Glucagon and adrenaline

41. The enzyme that produces the first mole of reduced potential in TCA cycle is
- a) Citric acid synthase
 - b) Aconitase
 - c) Citric acid dehydrogenase
 - d) Alpha keto glutaric dehydrogenase
42. The net energy produced by the oxidation of half mole of palmitoleic acid , is
- a) mole of ATP 63.5
 - b) mole of ATP 65.5
 - c) mole ATP 64.5
 - d) mole of ATP 66.5
43. All the following about Lactic acidosis are true (EXCEPT)
- a) In lack of oxygen pyruvic acid cannot be handled and is changed into lactic
 - b) It is caused by uncontrolled DM, starvation, and severe dieting
 - c) Tissue hypoxia and hypoperfusion force cells to breakdown glucose anaerobically
 - d) Is a condition caused by the buildup of lactic acid in the body
44. All the following are symptoms of Alkaptunurea EXCEPT
- a) dangerous softening of heart valves
 - b) formation of prostate and kidney stones
 - c) Thickening and dark blue discoloration of ear cartilage
 - d) painful joint disease including back, hips, and knees
45. Ketogenesis is
- a) The formation acetone, hydroxybutyrate, and aceto acetate in liver mitochondria, due un controlled DM, starvation, and severe dieting
 - b) The formation of acetone, hydroxybutyrate, and aceto acetate in the liver, and due un controlled DM, starvation, and severe dieting
 - c) The formation of acetone, hydroxybutyrate and aceto acetate primarily in the liver and kidney due to un controlled DM, starvation, and severe dieting
 - d) The formation of acetone, hydroxybutyrate and aceto acetate primarily in the liver and kidney due to the lack of carbohydrate
46. Cholecystokinin (CCK) will do all the following (EXCEPT)
- a) Will stimulate liver to secrete watery solution rich in bicarbonate
 - b) Will stimulate pancreas to release pancreatic lipase
 - c) Will decrease gastric motility
 - d) Cause contraction of gall bladder and release bile acids

47. How many moles of ATP will be produced from the oxidation of 45 gm galactose if Asp-Malate shuttle is applied

- a) 19
- b) 9.5
- c) 9.0
- d) 18.0

48. Secretin is a mucosal peptide hormone that

- a) stimulates gall bladder secretion, lower gastric motility, and stimulates pancreatic lipase
- b) stimulates the pancreas to release bicarbonate to rise the PH of intestine
- c) stimulates the pancreas and liver to release watery solution rich in bicarbonate
- d) stimulates the release of bile to emulsify fats

49. The product of the enzyme enoyl CoA hydratase is

- a) Acyl CoA
- b) Hydroxy-acyl CoA
- c) Acetyl CoA
- d) CoASH

50. If you know that pancreatic lipase hydrolyzes 50% of TAG completely, and the other 50% partially, if you have 10 moles of TAG, select the right answer

- a) 5 moles FAS + 5 moles glycerol + 5 moles 2-Monoglycerides 25
- b) 5 moles FAs + 9 moles glycerol + 1 mole 2-Monoglycerides 20
- c) 5 moles FAs + 5 moles glycerol + 5 moles 2-Monoglycerides 15
- d) 5 moles FAS + 10 moles glycerol + 10 moles 2-Monoglycerides 20

51. All the following about Maple syrup urine disease are true EXCEPT

- a) the pattern of inheritance is autosomal dominant pattern
- b) it leads to build up of leucine, isoleucine, and valine in blood and urine
- c) Only persons with homozygous chromosomes can develop the disease
- d) A metabolic disorder caused by a deficiency in branched chain amino acids dehydrogenase

52. Glycogenin

- a) Is a protein that initiates glycogen synthesis
- b) CO is an enzyme that catalysis the attachment of galactose to one of its tyrosine residues
- c) k an enzyme that catalysis the attachment of glucose to one of its tyrosine residues
- d) Is an enzyme that catalysis the attachment of UDP-glucose to one of its tyrosine residues

53. In MCADD disorder all the following are true (EXCEPT)

- a) It must be insured that patients never go without food for more than 10-12 hours
- b) Complete cure of the disease can be achieved by proper management
- c) Patient should take daily carnitine doses
- d) Patients should not depend on fats for energy

54. Acetyl CoA is the fuel keeping TCA cycle running and is derived from all food stuff and can produce

- a) 3 NADH + 1 FADH + 1 ATP+1 CoA
- b) 3 NADH + 1 FADH +1 GTP
- c) 1 GTP+1 COA 3+ NADPH+ 1 FADH
- d) 3 NADH+ 1 FADH+1 GTP + 1COA

55. The enzymes of hexose monophosphate pathway are located in the cytoplasm of all the following tissues (EXCEPT)

- a) Liver
- b) Adipose tissue
- c) Adrenal glands
- d) White blood cells

56. Gastric lipase has limited value in adults because

- a) All the above are wrong
- b) Emulsified fat PH in stomach due to gastric juice is 5, and its optimum PH is 7
- c) To act on fat. fat should be emulsified and its optimum PH is 7, while gastric PH is 1-2
- d) To Optimum PH is 2 but short chain fatty acid needs to be emulsified first

57. If a patient with galactosemia is placed on a galactose-free diet, the galactose required for glycoprotein biosynthesis would be derived from

- a) Mannose
- b) Gluco
- c) Galactose-I p
- d) Galactose amine

58. Hydroxy-3-methylglutaryl-CoA reductase is

- a) The rate limiting step in cholesterol synthesis produces mevalonate, and 2NADP and COA
- b) The rate limiting step in cholesterol synthesis produces mevalonate, and FADPH
- c) The enzyme that produces NADH from .acyl COA and HMG COA
- d) The rate limiting step in cholesterol synthesis produces HMG-COA, and FADPH

59. Glycogenesis is the formation of glycogen

- a) occurs in liver and muscles cytoplasm and needs, a primer, UDP-glucose, glycogen synthase
- b) occurs in liver and muscles mitochondria and needs, a primer, UDP-glucose, glycogen synthase and branching enzyme
- c) occurs in liver and muscles cytoplasm and needs, a primer, glucose, glycogen synthase and branching enzyme
- d) occurs in liver and muscles cytoplasm and needs , a primer, UDP-glucose, and .branching enzyme

60. In glycerol phosphate - DHA phosphate shuttle all the following are correct EXCEPT

- a) It takes place in all muscles except heart muscles
- b) NADH reduced potential is transferred to DHA phosphate
- c) cytosolic NADH end up as mitochondrial NADH
- d) Reduced potential is transferred from D .glycerol 3 P, to FAD

61. The net of complete oxidation of one mole of tri acyl palmitate is

- a) ATP 387
- b) ATP 129
- c) ATP 408
- d) ATP 258

62. Essential fructosuria is an inherited disease resulted from the lack of

- a) Fructokinase
- b) Aldolase
- c) Hexokinase
- d) phosphofructokinase

63. TAG is hydrolyzed by lipoprotein lipase to free fatty acids and glycerol, it is found in all the following (EXCEPT)

- a) In the capillaries of the mucosa
- b) In the capillaries of adipose tissue
- c) In the capillaries of skeletal and cardiac muscles
- d) In the capillaries of lungs and kidneys

64. Reduced nucleotides such as FADH are 1 produced by which pathway

- a) Pentose Phosphate pathway
- b) aerobic glycolysis
- c) TCA cycle
- d) gluconeogenesis

65. Ketolysis take place in all the following tissues (except)

- a) muscles
- b) kidney
- c) Brain
- d) RBCS

66. HDL have the following functions (EXCEPT)

- a) Transports cholesterol from blood to tissues
- b) Transfers protein to other lipoproteins
- c) picks up cholesterol from cell membrane
- d) picks up lipids from other lipoproteins

67. How many moles of ATP will be produced from the oxidation of 342 gm milk sugar in skeletal muscles

- a) 36
- b) 72**
- c) 38
- d) 76

68. How many moles of ATP will be produced from the oxidation of half a mole of B-hydroxybutyrate ATP?

- a) 13.5 ATP**
- b) 27 ATP
- c) 12 ATP
- d) 24 ATP

69. The net energy product of complete B-oxidation of one mole of stearic acid is

- a) 129 ATP
- b) 131 ATP
- c) 148 ATP
- d) 146 ATP**

70. The complete B-oxidation of one mole of linoleic acid (net yield of ATP) is

- a) 148
- b) 142**
- c) 144
- d) 146

71. Which enzyme is defected in galactosemia

- a) galactose kinase
- b) uridine diphospho glucose epimerase
- c) phosphogalactose uridyle transferase**
- d) phosphogalactose uridyle epimerase

72. All of the following enzymes are cytoplasmic (EXCEPT)

- a) G6PDH
- b) glutathione reductase
- c) glutathione peroxidase
- d) pyruvate dehydrogenase**

73. Essential fructoseuria is

- a) a metabolic disorder resulted from the lack of fructokinase**
- b) a metabolic disorder resulted from the lack of aldolase
- c) a metabolic disorder resulted from the lack of hexokinase
- d) a metabolic disorder resulted from the lack of glyceroldehydrogenase

74. The fate of lactic acid

- a) metabolized to ATP and CO_2
- b) oxidized and decarboxylated to pyruvic acid
- c) decarboxylated to Acetyl CoA

75. The enzyme that catalyzes the last step in Krebs cycle is

- a) succinate thiokinase
- b) malate dehydrogenase
- c) fumarase
- d) citrate synthase

76. All of the following is true about reactive oxygen species (ROS) EXCEPT

- a) they are normal by products of oxygen metabolism
- b) have important role in cell signaling
- c) increase during environmental stress
- d) they are oxygen containing species including mineral acids

77. Bioenergetics is

- a) studying the thermodynamics of anabolic enzyme reactions
- b) studying the thermodynamics of catabolic enzyme reactions
- c) studying the thermodynamics of enzyme catalyzed reactions
- d) studying energy changes of exothermic and endothermic reactions

78. Isocitrate dehydrogenase

- a) acts on isocitric acid producing alpha keto glutaric and FADH
- b) it acts on citric acid producing alpha keto glutaric and NADH
- c) it acts on isocitric acid producing succinyl CoA and NADH
- d) it produces substrate for alpha keto glutaric dehydrogenase complex

79. How many moles of ATP are needed for the synthesis of glycogen (glucose) 500

- a) 500 ATP
- b) 1000 ATP
- c) 1500 ATP
- d) 2000 ATP

80. Transport of Na from cells to lumen is

- a) active mediated symport transport
- b) mediated uniport transport
- c) Passive mediated transport
- d) active mediated antiport transport

81. in Malate- Aspartate shuttle

- a) Malate moves from cytosol to mitochondria
- b) malate moves from mitochondria to cytosol
- c) Glutamate moves from mitochondria to cytosol
- d) alpha ketoglutarate moves from cytosol to mitochondria

82. Glucose 6 phosphat Dehydrogenase (G6PDH)

- a) Enzyme Of HMP shunt in the cytosol of mammary, glands, .testes, adrenal cortex
- b) Enzyme Of PPP shunt in the cytosol of mammary, glands, .testes, adrenal cortex, liver
- c) Enzyme Of PPP shunt in the cytosol of mammary glands, .testes, adrenal cortex, and liver
- d) Enzyme Of HMP shunt in the cytosol of mammary glands, testes, adrenal cortex, RBCS, .adipose tissue, and liver

83. About pentose phosphate pathway

- a) it is an alternative pathway of glycolysis, producing NADH, pentoses, CO₂, and trioses
- b) it is an alternative pathway of glycolysis.producing NADPH, pentoses, trioses, CO₂, and ATP
- c) It is an alternative pathway of glycolysis, producing NADPH, pentoses, CO₂ and trioses
- d) It is alternative pathway of glycolysis, .D producing FADPH, pentoses, CO₂, and trioses

84. Oxidation of one mole of succinyl CoA in skeletal muscles will give

- a) 5 ATP +1 GTP+ one oxaloacetate
- b) 6 ATP + 1 GTP + one oxaloacetate
- c) 6 ATP + 1 GTP + one fumarate
- d) None of the above

85. All the following about lipids are true (EXCEPT)

- a) Insoluble in water, but soluble in fat solvents like alcohol ether and benzene
- b) source of energy and thermal insulator
- c) found in animal tissues
- d) specific gravity less than one

86. According to Krebs- Kornberg 3 stages of metabolism

- a) Stage one takes place in the lumen and produce little energy
- b) Stage two takes place in the cytoplasm and produce the major part of energy
- c) Stage three takes place in the mitochondria and produce the major part of energy .
- d) A and C are correct

87. which enzyme produces substrate for triose phosphate Isomerase

- a) Aldolase
- b) Phosphorfructo kinase
- c) Enolase
- d) Glyceraldehyde 3phosphate dehydrogenase

88. The enzyme that ends TCA cycle is

- a) Malate dehydrogenase
- b) Succinate thiokinase
- c) Fumarase
- d) Enolase

89. How many moles of ATP will be produced from the oxidation of 171 gm milk sugar in skeletal muscles

- a) 36
- b) 72
- c) 38
- d) 76

90. In Cori cycle

- a) Exercising muscles consume glucose producing lactic acid from NADH and Pyruvic
- b) Lactic acid moves from liver to blood
- c) Glucose is synthesized in liver from lactic acid directly
- d) All the above are true

91. what is the result of oxidizing 1 mole of succinyl CoA into one mole of Oxaloacetate

- a) 6 ATP
- b) 5 ATP
- c) 7 ATP
- d) 8 ATP

92. cholesterol undergoes all the following pathways (EXCEPT)

- a) transported to intestine
- b) converted to bile acids and bile salts
- c) catabolized to CO₂, energy and H₂O in humans
- d) reduced by bacteria to neutral sterols (cholestanol) and excreted in feces

93. The attachment of one molecule of glucose to the growing chain glycogen will cost

- a) 2 ATP
- b) one ATP
- c) 2 GTP
- d) GTP

94. All the following enzymes are mitochondrial enzymes except

- a) Succinate thiokinase
- b) Malate dehydrogenase
- c) Phosphoenol pyruvate carboxy kinase (PEPCK)
- d) Pyruvate carboxylase

95. NADPH has the following functions (except)

- a) Keeping glutathione in the reduced form
- b) Having a role in Nitrogen oxide synthesis
- c) Transported to mitochondria via asp-malate shuttle
- d) Fatty acids and cholesterol synthesis

96. Glutathione

- a) is formed of glutamic and cystein and glycine is neurotransmitter
- b) Is glut-cystein-glycine and is antioxidant, immune booster, and skin whitener
- c) is formed of glutamic and cystein and arginine, and is antioxidant, immune booster
- d) Is formed of glutamic, alanine, and D cystein, and is anti aging, detoxifier, and antioxidant

97. The complete β -oxidation of one mole of cholesterol (27 carbons) is

- a) 135 ATP
- b) 131 ATP
- c) None of the above
- d) 129 ATP

98. Cholesterol is synthesized in

- a) In the cytosol of skin, liver and intestine cells
- b) In the mitochondrial of liver cells
- c) In the cytosol of all nucleated cells
- d) In the cytosol of liver cells

99. In fed and fasting states

- a) After carbohydrate meal brain consumption of sugar is stable while consumption is max
- b) In fasting brain consumption of sugar is max while liver consumption is max
- c) In basal condition glucagon and insulin secretion are even and consumption of energy by brain and muscles is
- d) minimum
- e) After carbohydrate meal brain consumption of sugar is stable while liver consumption is minimum

100. in Malate- Aspartate shuttle all the following are correct EXCEPT

- a) Reduced potential of NADH is transferred to oxaloacetate in cytoplasm
- b) Reduced potential entered mitochondria in the form of malate
- c) The shuttle takes place in the liver and cardiac muscle
- d) malate transferred reduced potential to FAD in the mitochondria

101. All the following are mitochondrial enzymes EXCEPT

- a) citric acid synthase
- b) succinyl CoA thio kinase
- c) Alpha ketoglutaric dehydrogenase
- d) Lactate dehydrogenase

102. About Taurine select the best answer

- a) It is incorporated in our tissue protein in the L-form
- b) It is never incorporated into any tissue protein of our bodies
- c) Taurine can be incorporated in all tissue except nervous tissues
- d) It is the most common free amino acid in plants

103. For the synthesis of one mole of Cholesterol we need

- a) 18 Acetyl CoA + 18 ATP + 4 NADPH
- b) 6 HMGCoA + 16 ATP + 2 NADPH
- c) 6 HMGCoA + 16 ATP + 2 NADPH
- d) 16 Acetyl CoA + 9 ATP + 4 NADPH

104. Disposal of ammonia from tissues take place by the following (EXCEPT)

- a) In the form of glutamic in cardiac muscle
- b) In the form of glutamine in brain and other tissues
- c) In the form of glutamine in the kidney
- d) In the form of alanine in muscles

105. All of the following about lipoproteins are true except

- a) Lipid transport and membrane components
- b) Some lipoproteins mediate the transport and uptake of cholesterol
- c) Cofactors for enzymes and ligands for cell surface receptors
- d) Source of essential amino

106. All the following are true (EXCEPT)

- a) D-amino acids can be deaminated first and then aminated to L-form before being used in our tissues
- b) D-amino acids are natural amino acids and found in all our tissues
- c) L-amino acids are natural amino acids and found in all our tissues
- d) D-amino acids are natural amino acids and found in antibiotics and plants

107. All the following are causes of negative nitrogen balance (EXCEPT)

- a) starvation and malnutrition
- b) Gastrointestinal disease and chronic
- c) hemorrhage lactation on an inadequate diet
- d) adopting ketodiet

108. Production of reduced nucleotides such as NADH is possible by all of the following metabolic pathways (EXCEPT)

- a) anaerobic glycolysis
- b) aerobic glycolysis
- c) Cori cycle
- d) TCA cycle

109. All the following about chylomicrons are true (EXCEPT)

- a) Degraded into chylomicrons remainants by lipoprotein lipase
- b) Formed exogenously in the mucosa from the diet and extruded into blood
- c) Degraded into chylomicrons remainants by pancreatic lipase
- d) Chylomicron is a capsule of phospholipids and cholesterol in the inside and TG and cholesterol ester in the outside

110. Fumarase catalyses the formation of which product

- a) malate
- b) succinate
- c) Oxalo acetate
- d) Succinyl CoA

111. About essential amino acids

- a) Histidine and arginine are essential only for infants
- b) All amino essential acids should be present to synthesize protein except histidine and arginine
- c) Arginine can be obtained in adults from intestinal flora
- d) Histidine and arginine are essential for adults

112. All the following are functions of nitrogen oxide (NO) EXCEPT

- a) Neurohumoral agent, potent vasoconstrictor
- b) prevents platelets aggregation
- c) brain neurotransmitter
- d) Smooth muscles relaxant

113. Urea synthesis is the process that detoxifies NH₃ into urea, Gout

- a) It takes place in the cytoplasm of both liver and kidney
- b) It takes place in the liver cytoplasm and mitochondria
- c) It takes place in the mitochondria of both kidney and liver
- d) It takes place in the cytoplasm and mitochondria of the kidney

114. How many moles of ATP will be produced from the oxidation of 171 gm milk sugar if asp-malate shuttle is applied

- a) 19
- b) 36
- c) 18
- d) 38

115. All the following are cytoplasmic liver enzyme (EXCEPT)

- a) arginosuccinase
- b) argininosuccinate synthase
- c) Carbamoyl phosphate synthase
- d) Arginase

116. In glutathione transport of amino acid

- a) none of the above
- b) amino acid from lumen binds first to glycine acid from glutathione and .glutamic-cysteine will be separated
- c) amino acid from lumen binds first to cysteine acid from glutathione and .glutamic-glycine will be separated
- d) amino acid from lumen binds first to glutamic acid from glutathione and cysteine glycine will be separate

117. HMG -CoA reductase is the enzyme that makes

- a) Mevalonate and consumes 2NADPH and 3 Actyl CoA
- b) Mevalonate and consumes 6 NADPH and one HMG CoA
- c) None of the above
- d) Mevalonate and consumes 2 NADPH and one HMG CoA

118. All of the following are sources of ammonia except

- a) Urease
- b) creatin kirsse (CK) action
- c) transdeamination and giutaminase
- d) glutaminase

119. ALT enzyme catalyzes which reaction

- a) glutamic + oxalo acetic
- b) glutamic + alanine
- c) glutamic + pyruvic
- d) alpha ketoglutaric + pyruvic

120. All the following are symptoms of PKU (EXCEPT)

- a) Lack of pigmentation and white skin
- b) mental retardation
- c) dangerous softening of heart valves
- d) failure to grow white hair

121. Biological value of protein (BV) means

- a) a measure of the ability of protein to provide adequate amino acids
- b) a measure of the ability of dietary protein to provide non-essential amino acids
- c) a measure of the ability of dietary protein to provide essential amino acids
- d) plant proteins contain adequate amounts of essential amino acids

122. Reactive Oxygen Species (ROS) are

- a) peroxides, superoxide, and OH radicals, and have only dangerous effect on tissues
- b) are very dangerous and cause oxidative stress and must be eliminated from the circulation by taking high doses of antioxidants
- c) are oxygen containing compounds naturally produced and have important role in cell signaling and homeostasis
- d) peroxides, superoxide, and OH radicals are natural byproducts of metabolism, and having no useful function

123. Non oxidative deamination of serine will produce

- a) pyruvic + ammonia + water
- b) alpha ketobutyric + ammonia + water
- c) pyruvic + urea + water
- d) pyruvic + hydrogen sulphide + water

124. All the following action about insulin are true (EXCEPT)

- a) increase the activity of ATP-citrate lyase and citrate synthase
- b) increase the activity of PFK and acetyl COA carboxylase
- c) increase the activity of glucokinase and glycogen synthase
- d) increase the activity of PEPCK and HMG- COA reductase

125. AST value of liver enzyme increases in all the following cases (EXCEPT)

- a) Myocardial infraction
- b) liver cinhosis
- c) liver cell damagece
- d) kidney failure

126. Albinism is

- a) A disorder due to lack of tyrosine oxidase and leads to light skin, hair, and eyes color
- b) A metabolic disorder due to lack of phenyl alanine hydroxylase, and leads to death from liver failure
- c) A metabolic disorder due to lack of tyrosine hydroxylase. And leads to mental retardation And albinism
- d) A metabolic disorder due to lack of tyrosinase

127. The enzyme that produces substrate for phosphoglycerate kinase is

- a) glyceraldehyde 3 phosphate
- b) dehydrogenase Aldolase
- c) Pyruvate kinase
- d) Pyruvate decarboxylase

128. Net result of TCA is

- a) One pyruvate will give $\text{acetyl CoA} + \text{CO}_2 + 3 \text{ NADH} + 1 \text{ FADH} + \text{GTP}$
- b) One glucose will give $\text{pyruvate} + 2 \text{ NADH} + 2 \text{ ATP}$
- c) One Acetyl CoA will give $3 \text{ NADH} + 1 \text{ FADH} + \text{CO}_2 + 1 \text{ GTP}$
- d) $\text{Acetyl CoA} + 3 \text{ NAD} + 1 \text{ FAD} + \text{GDP} + \text{P} \text{ will give } 3 \text{ NADH} + 1 \text{ FADH} + \text{GTP} + 2 \text{ CO}_2$

129. HDLs have the following functions (EXCEPT)

- a) picks up cholesterol from cell membrane
- b) Transfers protein to other lipoproteins
- c) picks up lipids from other lipoproteins
- d) transports cholesterol from blood to tissues

130. All the following about amino acid transport from lumen to cell are true (EXCEPT)

- a) D-amino acids are transported actively and need carrier, Na, and ATP
- b) L-amino acids are transported actively by special carrier
- c) L-amino acids are transported by simple diffusion
- d) there are carriers for neutral, acidic, basic, imino acids

131. In Cori cycle

- a) none of the above
- b) Lactate moves from the exercising muscles into the liver to be transformed into glucose, to be reused by the liver for storage
- c) Exercising muscles use sugar in the lack of Oxygen and the produced lactic is transported into the liver to be changed into glucose
- d) Glucose moves from liver to resting muscles to be changed into glycogen as stored sugar

132. PKU IS

- a) a metabolic disorder due to lack of phenylalanine hydroxylase , and leads to light skin color and muscles tension
- b) a metabolic disorder due to lack of phenyl alanine hydroxylase , and leads to death from liver failure
- c) a metabolic disorder due to lack of tyrosine hydroxylase
- d) a metabolic disorder due to lack of phenylalanine hydroxylase , and leads to dark urine and cartilage pigmentation

Complete oxidation of 1 mole of $\begin{array}{c} \text{CH}_3 \\ | \\ \text{O}=\text{C} \\ | \\ \text{CH}_3 \end{array}$ will give

133.

- a) 24 ATP
- b) 12 ATP
- c) 27 ATP
- d) None of the above

134. AST enzyme catalyzes which reaction

- a) Alanine + oxalo acetic
- b) Oxalo acetic + alpha ketoglutaric
- c) Glutamic + aspartic
- d) Glutamic + oxalo acetic

135. after having a heavy carbohydrate meal all the following are true (EXCEPT)

- a) Insulin is high and glycogenesis is activated
- b) Pyruvate dehydrogenase and Pyruvate dehydrogenase phosphatase are active
- c) Glycogen phosphatase and adenylate cyclase are active
- d) Glucagon , and pyruvate dehydrogenase kinase are low

136. NADPH produced by HMP or PPP is used in all the following processes (EXCEPT)

- a) Reductive biosynthesis
- b) Reduction of hydrogen peroxide
- c) Synthesis of Nitric oxide
- d) Synthesis of arginine

137. net result of aerobic glycolysis of one mole of glucose is

- a) 2 pyruvic acid + 2NADH + 2 ATP
- b) 2 pyruvic acid + 2 NADPH + 2 ATP
- c) 2 lactic acid + 2 NADH + 2ATP
- d) 2 lactic acid + 2 ATP

138. How many moles of ATP will be produced from the oxidation of 342 gm lactose if asp malate shuttle is used

- a) 38
- b) 136
- c) 76
- d) 72

139. How many moles ATP will be produced from complete oxidation of 88 gm of pyruvic acid ($C_3H_4O_3$) in the liver

- a) 15 ATP
- b) 7.5 ATP
- c) 3.75 ATP
- d) 1.8 ATP

140. glutathione peroxidase catalyses which reaction

- a) $2H_2O + GS - SG \rightarrow H_2O_2 + 2GSH$
- b) $H_2O_2 + 2GSH \rightarrow 2H_2O + GS-GS$
- c) $NADP + + 2GSH \rightarrow NADPH + GS-SG$
- d) $G6P + NADP \rightarrow 6P\text{ gluconate} + NADPH$

141. The net energy produced by the oxidation of one mole of stearic acid , is

- a) None of the above
- b) 146mole of ATP
- c) 144mole of ATP
- d) mole ATP 148

142. pyruvate dehydrogenase phosphatase is activated by

- a) Insulin
- b) Glucagon
- c) Adrenaline
- d) Growth hormone

143. All the following about (LDL) are true (EXCEPT)

- a) Transport cholesterol from tissues to liver
- b) Cause atherosclerosis , hypertension , and coronary and cerebro - vascular disease
- c) Increase plasma cholesterol and cholesterol ester
- d) Transport cholesterol from blood to tissues

144. What is the source of ammonia in urea molecule?

- a) one from free ammonia in mitochondria and one from fumaric acid
- b) one from free ammonia in mitochondria and one from arginine
- c) one from free ammonia in mitochondria and one from ornithine
- d) one from free ammonia in mitochondria and one from aspartic in cytosol

145. linolenic acid is

- a) Saturated fatty acid having 16 carbons
- b) Essential fatty acid having 18 carbons and 3 double bonds
- c) Essential fatty acid having 18 carbons
- d) Saturated fatty acid having 18 carbons and 2 double bonds

146. Glutathione is

- a) precursor of epinephrine and melanin biosynthesis
- b) composed of glycine - glutamine and cysteine and is an antioxidant
- c) composed of glycine - glutamic and cysteine and is an immune booster
- d) Potent vasoconstrictor

147. Insulin activates all the following enzymes (EXCEPT)

- a) Glycogen synthase
- b) citric acid synthase
- c) Aldolase
- d) Glycogen phosphorylase

148. All the following about Maple syrup urine disease are true EXCEPT

- a) A metabolic disorder caused by a deficiency of branched chain keto acid dehydrogenase
- b) the inheritance mode is autosomal recessive
- c) it leads to the buildup of isovaleric , methyl butyric , isobutyricCoAs.
- d) it leads to build up of leucine , isoleucine , and valine in blood and urine.

149. How many moles of ATP will be produced from the oxidation of 90 gm fructose if asp - malate shuttle was performed

- a) ATP 19
- b) ATP 18
- c) ATP 38
- d) ATP 36

150. Transport of fructose from lumen to first line of epithelial cells in microvillae is

- a) active mediated antiport transport
- b) Passive mediated uniport transport
- c) active mediated uniport transport
- d) active mediated symport transport

151. fructose intolerance is an inherited disease resulted from the lack of

- a) Fructokinase
- b) Aldolase
- c) Hexokinase
- d) Phosphofructokinase

152. all the following about pyruvate dehydrogenase are true (EXCEPT)

- a) it is activated in the presence of high insulin/glucagon ratio
- b) it is deactivated by pyruvate dehydrogenase kinase
- c) it is an oxidizing decarboxylating enzyme and the step is irreversible
- d) it is deactivated by pyruvate dehydrogenase phosphatase

153. essential fructoseuria is an inherited disease resulted from the lack of:

- a) Fructokinase
- b) Aldolase
- c) Hexokinase
- d) Phosphofructokinase

154. Insulin is a hypoglycemic hormone, and it acts at least by

- a) decreases the uptake of glucose by tissues
- b) Stimulates the oxidation of glucose by tissues
- c) inhibits glycogenesis and lipogenesis
- d) Stimulates glycogenolysis and gluconeogenesis

155. Seretin is a peptide hormone produced by mucosa cells of small intestine

- a) Cause contraction of gall bladder and release bile acids
- b) Will decrease gastric motility
- c) Will stimulate pancreas to release pancreatic lipase
- d) Will stimulate liver and pancreas to secrete watery solution rich in bicarbonate

156. this enzyme is responsible to move C3H4O3 resulted from glycolysis to the mitochondria

- a) Pyruvate translocase

157. what fuel is being used by resting muscles

- b) Free fatty acids

158. All the following pathways take place in mitochondria (EXCEPT)

- c) Gluconeogenesis.

159. How many moles of ATP will be produced from the oxidation of 171 gm lactose if asp-malate shuttle is applied.

- d) 38

160. How many moles of ATP will be produced from complete oxidation of $\frac{1}{2}$ mole of Dihydroxy acetone phosphate in cardiac muscles.

- e) 19 ATP

161. How many moles ATP will be produced from complete oxidation of 44 gm of pyruvic acid in the liver. Atomic weights (carbon= 12, oxygen = 16, Hydrogen =1)

f) 7.5 ATP

162. How many moles of ATP can be produced from the oxidation of 1 mole of succinyl CoA into one mole of Oxaloacetate.

g) 6 ATP

163. In Krebs Kornberg 3 stages of metabolism

h) The major part of energy is produced in 3rd stage during TCA cycle.

164. Starch is completely digested in

i) in the small intestine.

165. Ammonia from muscles are transported in the form of

- a) alanine
- b) glutamine
- c) free ammonia
- d) Asparagine

166. All the following are mitochondrial enzymes (EXCEPT)

- a) lactate dehydrogenase
- b) Alpha ketoglutaric dehydrogenase
- c) Citric acid synthase
- d) Succinyle CoA thio kinase

167. In amino acid transport.

- a) All amino acids use the same carrier.
- b) Ionic amino acids are transported with the same carrier
- c) The charge, the size, and the kind of amino acid, decide t kind of carrier to be used.
- d) Non of the above

168. Under exercise condition

- a) Insulin secretion is high and muscle consumption of glucose is max
- b) Glucagon secretion is high and muscle consumption of glucose is max.
- c) Insulin secretion is high and muscle consumption of glucose is min
- d) Glucagon secretion is high and muscle consumption of glucose is min

169. After a carbohydrate meal

- a) Glucagon secretion is high and liver is utilizing max. glucose for storage
- b) Glucagon secretion is low and liver is utilizing min. glucose.
- c) Insulin secretion is high and liver, muscle and adipocytes utilize max glucose for storage.
- d) Non of the above

170. NADH and FADH yield different amount of energy because:

- a) They utilize different amount of oxygen
- b) The loss of electrons by NADH oxidation is higher than that of FADH oxidation
- c) The yield of electrons by FADH oxidation is higher than those of NADH.
- d) The amount of free energy produced by NADH is higher only if oxidation takes place in the mitochondria.

171. All of the following statements concerning carbamyl phosphate synthase are true EXCEPT

- a) It requires ATP.
- b) It combines CO₂ and NH₃.
- c) It produces carbamyl phosphate.
- d) it is a cytosolic enzyme.

172. Argininosuccinate synthase couples aspartate with which compound

- a) ornithine.
- b) citrulline.
- c) fumarate.
- d) arginine.

173. Arginase results in the formation of what compound

- a) ornithine.
- b) citrulline.
- c) carbamyl phosphate.
- d) fumarate.

174. Ornithine transcarbamylase combines ornithine and carbamyl phosphate to form which compound

- a) Argininosuccinate
- b) Fumarate.
- c) arginine
- d) citrulline.

175. Urea cycle can be summarized in one equation

- a) CO₂ + NH₃ + 3 ATP + H₂O + arginine ----- fumarate + urea + 2 P + 2ADP + AMP
- b) CO₂ + NH₃ + 3 AIP + H₂O + Aspartate ----- arginine + urea + 2 P + 2ADP + AMP
- c) CO₂ + NH₃ + 3 ATP + H₂O + Aspartate ----- fumarate + urea + 2 P + 2ADP + AMP
- d) CO₂ + NH₃ + 3 AIP + H₂O + fumarate ----- aspartate + urea + 2 P + 2ADP + AMP

176. For the synthesis of one mole of palmitic acid you need

- a) 1- Acetyl CoA + 8 Malonyl coA + 16 NADH
- b) 1-Acetyl CoA + 7 Malonyl coA + 12 NADH
- c) 1-acetyl CoA + 7 Malonyl coA + 14 NADPH
- d) 1- Acetyl CoA + 7 Malonyl coA + 14 NADH.

177. Non oxidative deamination of threonine will give

- a) pyruvic, ammonia and wateralanine,
- b) ammonia and waterpyruvic,
- c) Sulphur oxide and ammonia
- d) alpha keto butyric, ammonia and water.

178. All the following about ALT is true (EXCEPT)

- a) its activity is increased in liver cells damage
- b) its activity is increased liver cirrhosis
- c) it is known as SGOT
- d) d) it is known as SGPT

179. The net energy produced by the oxidation of one mole of Arachidonic acid is

- a) 158 ATP
- b) 152 ATP
- c) 155 ATP
- d) 148 ATP

180. Phospho Enol Pyruvate Carboxy Kinase (PEPCK) is activated by all the following (EXCEPT)

- a) Insuline
- b) Growth hormone
- c) Adrenaline
- d) Glucagon

181. The source of ammonia in urea comes from

- a) free ammonia from liver + ammonia from arginine amino acid
- b) free ammonia from liver + ammonia from glutamin amino acid
- c) free ammonia from liver + ammonia from aspartic acid
- d) free ammonia from liver + ammonia from alanine amino acid

182. All the following are symptoms of Alkaptonurea EXCEPT

- a) formation of prostate and renal stones
- b) thickening and dark blue discoloration of ear cartilage
- c) painful joint disease including back, hips, and knees
- d) dangerous softening of heart valves

183. All the following enzymes are found in the mitochondria EXCEPT

- a) Enol CoA hydratase
- b) Acyl CoA dehydrogenase
- c) Acyl CoA synthetase
- d) B-Ketothiolase

184. AST level is high in all the following disease EXCEPT

- a) liver cells damage
- b) myocardial infraction
- c) liver cirrhosis
- d) osteoplastic bone disease

185. ketolysis is

- a) is the utilization of ketone bodies in the mitochondria of kidney, liver, and brain in fasting
- b) it takes place in RBCs and liver only in case of severe dieting
- c) is the utilization of ketone bodies in all extra hepatic tissues except brain
- d) none of the above

186. HDL have the following functions (EXCEPT)

- a) picks up cholesterol from cell membrane
- b) transports cholesterol from liver to tissues
- c) Transfers protein to other lipoproteins
- d) picks up lipids from other lipoproteins

187. All the following about Taurine are true (EXCEPT)

- a) never incorporated into body protein
- b) most common free amino acid in body
- c) taurine is found conjugated to cholic acid
- d) taurine is found only in soft tissue proteins

188. Colipase is

- a) It has significant action only in infants because its optimum PH is 7
- b) Liver and pancreatic watery solution rich in bicarbonate that neutralize food from stomach
- c) A protein present in pancreatic secretion, fixes lipase to the surface of lipid particles
- d) An enzyme that hydrolyses TAG at positions 1 and 3 producing 2-monoglycerides and 2 Fatty Aids.

189. How many moles of ATP will be produced from the oxidation of 684 gm milk sugar in skeletal muscles

- a) 152
- b) 144
- c) 72
- d) 76

190. The net energy produced by the oxidation of one mole of Arachidonic acid is

- a) 158 ATP
- b) 152 ATP
- c) 148 ATP
- d) 155 ATP

191. How many moles of ATP will be produced from the oxidation of 360 gm galactose if Asp-Malate shuttle is applied

- a) 72
- b) 76
- c) 36
- d) 38

192. From 1 mole of succinyl CoA into one mole of Oxaloacetate in TCA cycle the sequence of the resulted products is

- a) GTP, FADH, NADH, oxalo acetate
- b) GTP, NADH, FADH, oxalo acetate
- c) GTP, NADH, Oxalo acetate, FADH
- d) GTP, NADPH, FADH, oxalo acetate

193. How many moles ATP will be produced from complete oxidation of 22 gm of pyruvic acid in muscle
Atomic weights

(carbon = 12 , oxygen = 16 Hydrogen = 1)

- a) 7.5 ATP
- b) 3.75 ATP
- c) 15 ATP
- d) 1.8 ATP

195. Production of reduced nucleotides such as NADPH is possible by the action of which enzyme

- a) Glyceraldehyde 3 P-dehydrogenase
- b) pyruvate dehydrogenase
- c) all of the above
- d) Glucose 6-phosphate dehydrogenase

197. Oxidation of one mole of succinyl CoA in skeletal muscles to CO₂ will give

- a) 23 ATP
- b) 22 ATP
- c) 21 ATP
- d) None of the above

198. Transport of glucose from lumen to the first line of epithelial cells in microvillae is

- a) Indirect active mediated uniport transport
- b) Direct active mediated antiport transport
- c) Indirect active mediated symport transport
- d) Direct active mediated symport transport

199. Starch is completely digested by the action of

- a) alpha and beta amylases in the mouth and dextrinase in the small intestine
- b) alpha and beta amylases in the small intestine
- c) alpha and dextrinase in the small intestine
- d) alpha and beta amylases in the mouth and small intestine

200. The normal renal threshold of glucose is 180mg/dl , this means that

- a) If blood glucose is higher than 180mg/dl, the kidney secretes glucose to the blood stream
- b) If blood glucose is lower than 180mg/dl glucose reabsorption occurs
- c) If blood glucose is lower than 180mg/dl, the kidney secretes glucose to the blood stream
- d) If blood glucose is higher than 180mg/dl glucose reabsorption occurs

201. glycogen phosphorylase acts on glycogen to give

- a) (Glucose) $n-x$ and (glucose-1P) x
- b) (Glucose) $n-x-1$ and glucose
- c) (glucose) $n-x$ and (glucose) x
- d) (Glucose-1-P) x and (glucose) $n-x-1$ and Glucose

202. All the following is true about Reactive Oxygen species (ROS) EXCEPT

- a) they are normal byproducts of oxygen metabolism
- b) have important role in cell signaling and homeostasis
- c) increase during environmental stress
- d) they could be generated exogenously by non-ionizing radiation

203. Regulation of cholesterol synthesis is achieved by all the following mechanisms (EXCEPT)

- a) Regulation of HMG CoA reductase gene by excess cholesterol
- b) AMP activates protein kinase which deactivates HMG CoA reductase
- c) Insulin induces HMG CoA reductase
- d) Glucagon (upregulates) HMG CoA reductase

204. Ketogenesis is

- a) The formation of ketone bodies as acetone and acetoacetate primarily in the liver due to inavailability of carbohydrate.
- b) The formation of ketone bodies as acetone and acetoacetate primarily in the liver due to inavailability and/or improper utilization of carbohydrate and/or The Improper utilization.
- c) The formation of ketone bodies as acetone, hydroxybutyrate and acetoacetate in the liver, and kidney due to inavailability and/or improper utilization of carbohydrate and/or the improper utilization
- d) none of the above

205. Lipogenesis

- a) The formation of triglycerides from a glycerol skeleton and 3 molecules of palmitic acid in the adipose tissues and hepatocytes
- b) the formation of fatty acids in the adipose tissue cytoplasm from all kinds of food stuffs
- c) formation of fatty acids and the triglycerides in the cytoplasm of mammary glands adipocytes, and hepatocytes
- d) the formation of fatty acids in the liver mitochondria from any food that can give acetyl CoA

206. Glucagon inactivates all the following enzymes (EXCEPT)

- a) Pyruvate dehydrogenase kinase.

207. For the synthesis of one mole of Cholesterol we need

- a) 16 Acetyl CoA
- b) 18 Acetyl CoA
- c) 15 Acetyl CoA
- d) None of the above

208. The net result of oxidation of one mole of Acetyl CoA in TCA cycle is

- a) $\text{NADH} + \text{FADH} + 1 \text{ GTP} + 2 \text{ CO}_2 + 1 \text{ CoA}$

209. Medium chain acyl CoA dehydrogenase deficiency (MCADD) is

- a) metabolic disorder associated with inborn errors of Acyl CoA having 12 carbons
- b) Fatty acid oxidation disorder associated with inborn errors in metabolism of medium chain fatty acids in the mitochondria
- c) Fatty acid oxidation disorder associated with inborn errors in metabolism of 6-12 carbons fatty acids in the cytosol
- d) Fatty acid oxidation disorder associated with inborn errors in metabolism of fatty acids with over 14 carbons

210. Regulation of cholesterol synthesis is achieved by all of the following mechanisms (EXCEPT)

- a) AMP deactivates protein kinase which activate HMG coA reductase
- b) down regulation of HMG coA reductase gene by excess cholesterol
- c) SREBP enhancing the transcription of HMG- CoA reductase mRNA
- d) Insulin induces production of HMG CoA reductase

211. glycogen phosphorylase acts on glycogen to give

- a) n-x-1 and glucose (Glucose)
- b) n-x(glucose-1P)x(Glucose)
- c) n-x and (glucose)x(glucose)
- d) (glucose)nx-1 and Glucose (Glucose-1-P)

212. How many moles of ATP will be produced from complete oxidation of $\frac{1}{2}$ mole of Dihydroxy aceton phosphate in skeletal muscles

- a) 20 ATP
- b) 19 ATP
- c) 18 ATP
- d) 18.5 ATP

213. How many moles of ATP will be produced from the oxidation of one mole of saturated fatty acid having 7 carbons

- a) 52
- b) 58
- c) 54
- d) 56

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214. Select the enzyme that makes product to alpha keto glutaric

- a) dehydrogenase Citric acid synthase
- b) Aconitase
- c) Citric acid dehydrogenase
- d) Alpha keto glutaric dehydrogenase

215. Adenylate cyclase is

- a) activated by insulin producing c AMP activating pyruvate dehydrogenase
- b) is activated by glucagon and adrenaline and produces CAMP that in activates glycogen synthase kinase
- c) is activated by insulin and produces CAMP that in activates glycogen synthase
- d) is activated by glucagon and adrenaline and produces CAMP that activates glycogen phosphatase

216.the source of the two nitrogen in urea are from

- a) one from ammonia and one from aspartic.
- b) one from ammonia and from ornithine.
- c) one from ammonia and from arginine
- d) the two nitrogen are from ammonia

217.All of the following are true concerning fate of glucose in human body EXCEPT

- a) red blood cells oxidize glucose to $\text{CO}_2 + \text{H}_2\text{O}$.
- b) liver cells oxidize glucose to $\text{CO}_2 + \text{H}_2\text{O}$.
- c) brain cells oxidize glucose to $\text{CO}_2 + \text{H}_2\text{O}$.
- d) Anaerobically muscles oxidize glucose to Pyruvic + Lactic.

218.All of the following biochemical adjustments would result from fast EXCEPT

- a) insulin levels increase and glucagon levels decrease.
- b) liver supplies glucose to blood.
- c) gluconeogenesis increases.
- d) adipocyte triglycerides are released as free fatty acids.

219.Galactosemia is

- a) genetic disease characterized by the accumulation of galactose 1-P. in the blood due to the absence of P.Gala, uridyl transferase enzyme
- b) A genetic disease characterized by the accumulation of galactose in the blood due to the absence of Gala. uridyl transferase enzyme
- c) A genetic disease characterized by the accumulation of galactose. in the blood due to the absence of Galacto kinase enzyme.
- d) non of the above.

220.Keton bodies formation is the liver

- a) The formation of keton bodies as acetone and aceto acetate primirly in the liver due to in availability of carbohydrate .
- b) The formation of ketone bodies as acetone and aceto acetate primirly in the due to in availability and / or improper utilization of carbohydrate and / or Improper utilization. acetate
- c) The formation of keton bodies as acetone , hydroxybutyrate and aceto in the liver , and kidney due to in availability and / or improper utilization of carbohydrate and / or the Improper utilization.
- d) Non of the above.

221. for the formation of one mole of palmitic acid you need

- a) 1-acetyl CoA + 8 Malonyl coA + 16 NADH.
- b) 1-acetyl CoA + 7 Malonyl coA +14 NADH.
- c) 2-Acetyl CoA + 7 Malonyl coA + 14 NADH.
- d) 7-Acetyl CoA +2 Malonyl coA + 2 NADH.
- e) 1-Acetyl CoA +14 Malonyl coA + 14 NADH.

222. Action of Insulin

- a) Glucose entry and utilization of cell increase.
- b) Increase of Glucose entry and utilization of cell and increase lipogenesis
- c) Increase of Glucose entry and utilization of cell and increase of lipolysis.
- d) Increase of Glucose entry, glycogenesis and l, lipogenesis

223. aldolase enzyme is

- a) catalyzing the formation of 2 moles of triose phosphate
- b) catalyzing the break down of glucose 1,6 diphosphate.
- c) catalyzing the formation of fructose 1,6 diphosphate.
- d) catalyzing the formation of 2 moles of ATP.

224. All of the following events would occur in a hyperglycemia person EXCEPT

- a) insulin secretion
- b) increase in pyruvate dehydrogenase phosphatase activity
- c) increase in rate of glucose transport into cells
- d) decreased glycogen synthesis.

T & F.H

1. Biochemistry is the study of chemical composition of living things and changes taking place in those living things

- a) True
- b) False

2. Heterotrophs depend on sun energy in building their food, while Autotrophs use others to build their food

- a) True
- b) False

3. Proteins represent about 50% of the dry weight of most living things

- a) True
- b) False

4. Phosphoglycerate kinase acts on 3-phosphoglycerate and produces ATP and 1,3-bisphosphoglycerate

- a) True
- b) False

5. All living things share the ability to reproduce, but only animals can respond to external stimuli

- a) True
- b) False

6. Glycokinase catalyzes the first step in glycolysis and produces substrate for phosphofructokinase

- a) True
- b) False

7. Catabolism is a degradative process in which large molecules are broken down into smaller ones and always yields energy

- a) True
- b) False

8. Anabolism is a degradative process in which large molecules are broken down into smaller ones

- c) True
- d) False

9. Glucokinase catalyzes the first step in glycolysis and produces substrate for phosphofructokinase (PFK)

- a) True
- b) False

10. According to Krebs kornberg 3 stages of metabolism, the major amount of .energy is produced in stage 2

- a) True
- b) False

11. Glucose is transported from cells to blood by passive mediated transport system

- a) True
- b) False

12. Glycolysis is the breakdown of glucose and release of some energy in the cytoplasm in absence of oxygen

- a) True
- b) False

13. Metabolism is the sum of all enzyme catalyzed reactions taking place in the cytoplasm of living cells

- a) True
- b) False

14. PFK is the rate limiting step in glycolysis and produces substrate for aldolase

- a) True
- b) False

15. An aerobic glycolysis takes place in the cytoplasm and produces 2ATP + 2 NADH + 2 pyruvate per each one glucose

- a) True
- b) False

16. Aerobic glycolysis takes place in the mitochondria and produces 2ATP + 2 NADH + 2 pyruvate per each one glucose

- a) True
- b) False

17. Aerobic glycolysis takes place in the mitochondria and produces, 2ATP + 2 NADH + 2 pyruvate per each one glucose

- a) True
- b) False

18. Transport of glucose from lumen to first line of epithelial cells take place by indirect active mediated symport system

- a) True
- b) False

19. Sucrose is table sugar and is broken down in lumen into one glucose and one galactose

- a) True
- b) False

20. Aldolase acts on fructose 1,6 diphosphate and produces substrate for triose phosphate isomerase

- a) True
- b) False

21. Glycolysis take place in the cytoplasm of almost all living organisms with the exception of mammals

- a) True
- b) False

22. Transport of fructose from lumen to the microvilli by facilitated passive transport

- a) True
- b) False

23. Glucokinase catalyzes the first step in glycolysis and produces substrate for phosphor fructokinase (PFK)

- a) True
- b) False

24. Anabolism is a degradative process in which large molecules are broken down into smaller ones

- a) True
- b) False

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Question 40

Not yet answered

 [Flag question](#)

Which enzyme initiates the removal of RNA primers from Okazaki fragments by first nicking the RNA strand?

- ☐ a. DNA ligase I
- ☒ b. Ribonuclease H1
- ☐ c. DNA polymerase ϵ
- ☐ d. Topoisomerase I

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Question 39

Answer saved

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Human mitochondrial DNA (mtDNA) is organized differently from nuclear DNA. Where is the mitochondrial chromosome found?

- ☐ a. In the cell nucleus
- ☐ b. On the rough endoplasmic reticulum
- ☒ c. In the mitochondrial matrix (inside mitochondria)
- ☐ d. Scattered freely in the cytosol outside organelles

[Clear my choice](#)



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Question 38

Answer saved

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In the DNA double helix, how are the sugar-phosphate backbone and bases oriented?

- ☐ a. Sugar-phosphate backbone is on the inside of the helix and bases are exposed on the outside.
- ☐ b. Both backbone and bases are on the outside surface.
- ☒ c. Sugar-phosphate backbone is on the outside and the bases stack on the inside of the helix.
- ☐ d. The backbone and bases alternate inside and outside along the helix.

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Question 37

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Meiotic nondisjunction refers to the failure of chromosomes to separate properly during meiosis. Which scenario describes nondisjunction in Meiosis I?

- ☐ a. Sister chromatids of a chromosome fail to separate during Anaphase I.
- ☒ b. Homologous chromosomes fail to segregate during Anaphase I, so a gamete receives two of the same chromosome.
- ☐ c. Both paternal and maternal chromosomes move to the same pole, leaving none to the other cell.
- ☐ d. Chromosomes do not condense during Prophase I.

[Clear my choice](#)

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Question 36

Answer saved

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The eukaryotic replicative helicase (Mcm2–7 complex, with GINS and Cdc45) moves along DNA in which direction on the template strand?

- ☐ a. 5' → 3' on the leading-strand template
- ☒ b. 3' → 5' on the leading-strand template
- ☐ c. 5' → 3' on the lagging-strand template
- ☐ d. It does not move; it acts as a static clamp.

[Clear my choice](#)



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Question 35

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Which statement about histone proteins is FALSE?

- ☐ a. They are basic and rich in lysine and arginine.
- ☐ b. They carry a positive charge at physiological pH.
- ☐ c. They form an octamer core in nucleosomes.
- ☒ d. They are composed largely of acidic amino acids.

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Question 34

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Which statement about genes is correct?

- ☐ a. Each gene is made of protein.
- ☐ b. Genes are circular DNA molecules in the nucleus.
- ☐ c. Genes are RNA segments that code for proteins.
- ☒ d. Genes are linear segments of DNA with a specific location (locus) on a chromosome.

[Clear my choice](#)



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Question 33

Answer saved

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Which nitrogenous base is found in DNA but not in RNA?

- ☐ a. Adenine
- ☐ b. Guanine
- ☐ c. Cytosine
- ☒ d. Thymine

[Clear my choice](#)



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Question 32

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In human oogenesis, meiotic nondisjunction most commonly occurs during:

- ☒ a. Anaphase I of meiosis (failure of homologous chromosomes to separate)
- ☐ b. Anaphase II of meiosis (failure of sister chromatids to separate)
- ☐ c. Metaphase I (failure of pairing)
- ☐ d. S phase of meiosis (failure of DNA replication)

[Clear my choice](#)

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Question 31

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Pyrimidine nucleosides end in the suffix "-dine." Which of the following is a pyrimidine nucleoside?

- ☐ a. Adenosine
- ☐ b. Guanosine
- ☒ c. Cytidine
- ☐ d. Deoxyadenosine

[Clear my choice](#)



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Question 30

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How does Anaphase I of meiosis differ from Anaphase of mitosis?

- ☐ a. In meiosis I, only sister chromatids separate, whereas in mitosis homologs separate.
- ☒ b. In meiosis I, homologous chromosomes (each still with sister chromatids attached) are pulled to opposite poles, rather than sister chromatids separating.
- ☐ c. Spindle fibers do not attach to centromeres in meiosis I.
- ☐ d. There is no difference; the processes are identical.

[Clear my choice](#)

Question 29

Answer saved

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Approximately how many base pairs of DNA are associated with each nucleosome, including both the core DNA and the linker DNA?

- ☐ a. 146 bp
- ☐ b. 200 bp
- ☒ c. ~200 bp (approximately 146 bp core + ~50 bp linker)
- ☐ d. 300 bp

[Clear my choice](#)



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Question 28

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Conversely, which base is found in RNA but not in DNA?

- ☐ a. Adenine
- ☐ b. Guanine
- ☐ c. Cytosine
- ☒ d. Uracil

[Clear my choice](#)



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Question 27

Answer saved

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What is the term for the structure of four chromatids (two homologous chromosomes, each with two sister chromatids) that forms during prophase I of meiosis?

- ☐ a. Dyad
- ☒ b. Bivalent
- ☐ c. Monohybrid
- ☐ d. Tetranuclear

[Clear my choice](#)



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Question 26

Answer saved

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Among dietary components, which one is least likely to raise plasma uric acid levels, because its metabolism does not produce uric acid?

- ☐ a. Beer (yeast-derived purines)
- ☐ b. Red meat (purine-rich)
- ☒ c. Caffeinated coffee (caffeine is a methylated purine that is metabolized differently)
- ☐ d. Shellfish (high in nucleic acids)

[Clear my choice](#)



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Question 25

Answer saved

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The ~300 nm chromatin loops are attached to a nuclear scaffold. These looped domains are anchored to:

- ☐ a. Histone H1 molecules
- ☐ b. The nuclear lamina under the nuclear envelope
- ☒ c. Protein scaffold/matrix
- ☐ d. The plasma membrane

[Clear my choice](#)



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Question 24

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After Telophase I of meiosis, the cells enter a brief interphase before Meiosis II. Which of the following events does NOT occur during this interphase?

- ☐ a. Chromosome decondensation and partial nuclear envelope reformation
- ☐ b. A brief pause in the cell cycle without DNA replication
- ☐ c. Completion of spindle disassembly
- ☒ d. Replication of the DNA (S phase)

[Clear my choice](#)



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Question 23

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Which set of bases are all present in RNA?

- ☐ a. A, T, G, C
- ☒ b. A, G, C, U
- ☐ c. A, G, T, U
- ☐ d. T, C, G, U

[Clear my choice](#)

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Question 22

Answer saved

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Which eukaryotic DNA polymerase is primarily responsible for continuous leading-strand DNA synthesis during replication?

- ☐ a. DNA polymerase α (alpha)
- ☐ b. DNA polymerase β (beta)
- ☐ c. DNA polymerase δ (delta)
- ☒ d. DNA polymerase ϵ (epsilon)

[Clear my choice](#)

Question 21

Answer saved

 [Flag question](#)

What technique is used to diagnose microdeletion syndromes?

- ☐ a. PCR (Polymerase Chain Reaction)
- ☒ b. FISH (Fluorescent In-Situ Hybridization)
- ☐ c. Southern Blotting
- ☐ d. Gel Electrophoresis

[Clear my choice](#)

Question 20

Answer saved

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Which of the following best describes the role of telomeres?

- ☐ a. They code for ribosomal RNA
- ☒ b. They maintain chromosome structural integrity
- ☐ c. They control cell division by acting as a centromere
- ☐ d. They regulate the synthesis phase of the cell cycle

[Clear my choice](#)

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Question 19

Answer saved

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Which online platform provides comprehensive information on Mendelian genetic disorders?

- ☐ a. GenBank
- ☐ b. Genome Database
- ☐ c. OMIM
- ☒ d. All of the above

[Clear my choice](#)

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Question 19

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Which online platform provides comprehensive information on Mendelian genetic disorders?

- ☐ a. GenBank
- ☐ b. Genome Database
- ☒ c. OMIM
- ☐ d. All of the above

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Question 18

Answer saved

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Which disorder was first described by Archibald Garrod as an example of an 'inborn error of metabolism'?

- ☐ a. Cystic fibrosis
- ☐ b. Phenylketonuria
- ☒ c. Alkaptonuria
- ☐ d. Down syndrome

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Question 17

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Mendel's findings were rediscovered by

- ☐ a. Correns
- ☐ b. Tschermak
- ☐ c. De Vries
- ☒ d. All

[Clear my choice](#)

Question 16

Answer saved

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Which structure in the nucleus is responsible for ribosomal RNA synthesis?

- ☐ a. Chromosomes
- ☐ b. Nuclear envelope
- ☒ c. Nucleolus
- ☐ d. Centromere

[Clear my choice](#)



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Question 15

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What percentage of all recognized first-trimester miscarriages is attributed to chromosomal abnormalities?

- ☐ a. 10-20%
- ☐ b. 30-40%
- ☒ c. 40-50%
- ☐ d. 60-70%

[Clear my choice](#)

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Question 13

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 [Flag question](#)

What percentage of all childhood hospital admissions in developed countries is due to genetic disorders and congenital malformations?

- ☐ a. 10-20%
- ☐ b. 20-30%
- ☒ c. 30-40%
- ☐ d. 40-50%

[Clear my choice](#)

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Question 12

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What is the function of telomerase?

- ☒ a. It adds telomeric DNA to the ends of chromosomes
- ☐ b. It repairs DNA mutations
- ☐ c. It transcribes messenger RNA
- ☐ d. It initiates DNA replication at the centromere

[Clear my choice](#)

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Question 10

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Which of the following statements is true about 'acquired somatic genetic disease'?

- ☐ a. It results from inherited genetic mutations present at birth
- ☒ b. It arises due to mutations occurring in body cells during a person's lifetime
- ☐ c. It is always passed down through generations
- ☐ d. It has no relation to aging or cancer

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Question 9

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What was the primary goal of the Human Genome Project, which started in 1990?

- ☐ a. To find a cure for cancer
- ☐ b. To develop gene therapy for genetic disorders
- ☒ c. To sequence the entire human genome
- ☐ d. To study genetic diseases exclusively in humans

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Question 8

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What is the primary function of the nucleus in a cell?

- ☐ a. Protein synthesis
- ☐ b. Energy production
- ☒ c. Storage of hereditary material
- ☐ d. Waste disposal

[Clear my choice](#)

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Question 7

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Why is gene therapy challenging for conditions like cystic fibrosis?

- ☐ a. The genetic mutations cannot be corrected
- ☒ b. It is difficult to target the correct cells and overcome immune defenses
- ☐ c. There are no suitable non-immunogenic vectors available
- ☐ d. The disease is not genetic in origin

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Question 6

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Which of the following statements about transposons is correct?

- ☐ a. They are stable and do not move within the genome
- ☒ b. They can cause mutations by inserting into functional genes
- ☐ c. They only exist in prokaryotic organisms
- ☐ d. They always function as coding sequences

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Question 5

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The process of transcription results in the formation of:

- ☐ a. DNA
- ☒ b. mRNA
- ☐ c. Protein
- ☐ d. Ribosomes

[Clear my choice](#)

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Question 4

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Which of the following statements about Barr bodies is correct?

- ☐ a. They are present in both male and female cells
- ☒ b. They represent an inactivated X chromosome
- ☐ c. They are found in somatic cells of males
- ☐ d. They determine the number of Y chromosomes in a cell

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