



BRAINWARE UNIVERSITY

Term End Examination 2020 - 21

Programme – Bachelor of Science (Honours) in Biotechnology

Course Name – Biochemistry and Metabolism

Course Code - BBTC302

Semester / Year - Semester III

Time allotted : 75 Minutes

Full Marks : 60

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question)

1 x 60=60

1. (Answer any Sixty)

(i) Which of the following is a disaccharide?

- | | |
|-------------|--------------|
| a) Fructose | b) Glucose |
| c) Sucrose | d) Galactose |

(ii) Maltose is composed of which two sugars?

- | | |
|--------------------------|---------------------------|
| a) Glucose and Glucose | b) Glucose and Fructose |
| c) Glucose and Galactose | d) Fructose and Galactose |

(iii) Which of the amino acid participate in 'O' glycosylation?

- | | |
|------------|-----------------|
| a) Serine | b) Glycine |
| c) Alanine | d) All of these |

(iv) Which of the following glycosidic linkage found in glycogen?

- | | |
|------------------------------|-----------------------------|
| a) Glucose (1 – 2) Fructose | b) Glucose (1 – 4) Glucose |
| c) Galactose (1 – 4) Glucose | d) Glucose (1 – 4) Fructose |

(v) Amylose has

- | | |
|----------------------------------|----------------|
| a) 1-4 and α -1-6 linkage | b) 1-2 linkage |
| c) 1-4 linkage | d) 1-3 linkage |

(vi) Which of the following enzyme catalyzes the first step of Krebs cycle?

- a) Citrate synthase
- b) Pyruvate kinase
- c) Enolase
- d) Phosphofructokinase-1

(vii) The substrate used in the first step of glycolysis is

- a) Glyceraldehyde 3-phosphate
- b) Pyruvate
- c) Glucose
- d) 1, 3-bisphosphoglycerate

(viii) Enzyme involved in the pathway of synthesis of acetyl-coA from pyruvate

- a) Hexokinase
- b) Pyruvate decarboxylase
- c) Pyruvate dehydrogenase
- d) Pyruvate kinase

(ix) In Glycolysis cycle

- a) Energy is stored in the form of ATP
- b) Energy is stored in the form of ADP
- c) Energy is liberated from ADP
- d) Energy is liberated from ATP

(x) In Kreb's cycle, a six carbon compound is formed by the combination of Acetyl CoA and

- a) Citric acid
- b) malic acid
- c) oxaloacetic acid
- d) succinic acid

(xi) Most enzymes that take part in glycolysis cycle are located in

- a) cytoplasm
- b) mitochondrial matrix
- c) plasma membrane
- d) outer mitochondrial membrane

(xii) Products of glucose oxidation essential for oxidative phosphorylation are

- a) Pyruvate
- b) Acetyl co-A
- c) NADPH and ATP
- d) NADH and FADH₂

(xiii) The effect of pumping out of hydrogen ions in the inter-membrane space

of the mitochondria is

- a) Increase ATP production
- b) Decreased levels of oxidative phosphorylation
- c) Increased levels of water in inter-membrane space
- d) Decreased levels of chemiosmosis

(xiv) Electron accepted from FADH₂ in electron transport chain by

- a) Flavin mononucleotide
- b) Ubiquinone
- c) Cytochrome c
- d) Cytochrome a

(xv) biological redox reaction always involves

- a) an oxidizing agent
- b) a gain of electrons
- c) a reducing agent
- d) all of these

(xvi) What happens after glycolysis when oxygen is available as an electron acceptor?

- a) Pyruvate is formed
- b) Fermentation
- c) NADH is produced
- d) Oxidative phosphorylation

(xvii) Number of chiral centers in threonine is

- a) 1
- b) 2
- c) 3
- d) 4

(xviii) De novo synthesis of purine nucleotide occurs in

- a) Mitochondria
- b) Cytosol
- c) Microsomes
- d) Ribosomes

(xix) In naturally occurring unsaturated fatty acids, the double bonds are in_____ conformation.

- a) Cis conformation
- b) Trans conformation
- c) A mixture of cis and trans conformation
- d) Cis and trans conformation alternatively

(xx) The sugar molecule in a nucleotide is

- a) Pentose
- b) Hexose
- c) Tetrose
- d) Triose

(xxi) Which of the following is a cyclic fatty acid?

- a) Cerebronic acid
- b) Ricinoleic acid
- c) Chaulmoorgic acid
- d) Oleic acid

(xxii) The nitrogenous base not present in DNA structure

- a) Guanine
- b) Adenine
- c) Cytosine
- d) Uracil

(xxiii) Which of the following is false about lipids?

- a) They are either strongly hydrophobic or amphipathic
- b) They are more soluble in water
- c) Extraction of lipids from tissues require organic solvents
- d) They are insoluble in water

(xxiv) The backbone of nucleic acid structure is constructed by

- a) Peptide bonds
- b) Phosphodiester bridges
- c) Glycosidic bonds
- d) All of them

(xxv) A dipeptide has

- a) 2 amino acids and 1 peptide bond
- b) 2 amino acids and 3 peptide bond
- c) 2 amino acids and 2 peptide bond
- d) 3 amino acids and 2 peptide bond

(xxvi) Which of the following is a Sphingophospholipid?

- a) Cardiolipin
- b) Plasmalogen
- c) Lecithin
- d) Sphingomyelin

(xxvii) Dietary triacylglycerols are transported from intestine to hepatic and

extra hepatic tissues by which of the following lipoproteins?

- a) Chylomicrons
- b) VLDL
- c) LDL
- d) HDL

(xxviii) All are non -essential fatty acids except

- a) Oleic acid
- b) Linolenic
- c) Palmitic acid
- d) Stearic acid

(xxix) For which out of the following compounds cholesterol does not serve as a precursor?

- a) Bile pigments
- b) Bile salts
- c) Vitamin D
- d) Sex hormones

(xxx) Glycerol is required for the formation of all of the following compounds except-

- a) Glucose
- b) Triacyl glycerol
- c) Phospholipids
- d) Glycolipids

(xxxi) Glycerol is present in-

- a) Cerebrosides
- b) Gangliosides
- c) Sphingomyelin
- d) Plasmalogen

(xxxii) Which phospholipid out of the following is a component of inner mitochondrial membrane?

- a) Cardiolipin
- b) Lecithin
- c) Plasmalogen
- d) Cephalin

(xxxiii) What is the nature of an enzyme?

- a) Vitamin
- b) Lipid
- c) Carbohydrate
- d) Protein

(xxxiv) One aromatic amino acid

- a) Tyrosine
- b) Alanine
- c) Lysine
- d) Arginine

(xxxv) Name the enzyme which catalyzes the oxidation-reduction reaction?

- a) Transaminase
- b) Glutamine synthetase
- c) Phosphofruktokinas
- d) Oxidoreductase

(xxxvi) Mark the correct function of enzyme, Peptidase?

- a) Cleave phosphodiester bond
- b) Cleave amino bonds
- c) Remove phosphate from a substrate
- d) Removal of H₂O

(xxxvii) Oxidative phosphorylation occurs in

- a) Cytoplasm
- b) ER
- c) Mitochondria
- d) Golgi apparatus

(xxxviii) Sucrose is composed of which two sugars?

- a) Glucose and Glucose
- b) Glucose and Fructose
- c) Glucose and Galactose
- d) Fructose and Galactose

(xxxix) Which of the following is not a homopolysaccharide?

- a) Starch
- b) Heparin
- c) Glycogen
- d) Cellulose

(xl) Which of the following glycosidic linkage found in maltose?

- a) Glucose (?-1 – 2?) Fructose
- b) Glucose (?1 – 4) Glucose
- c) Galactose (?1 – 4) Glucose
- d) Glucose (?1 – 4) Glucose

(xli) Cellulose is made up of repeating units of

- a) 1-4 linkage between D-glucose units
- b) 1-2 linkage between D-glucose units

- c) 1-6 linkage between D-glucose units d) 1-3 linkage between D-glucose units

(xlii) Which of the following enzyme catalyzes the first step of glycolysis?

- a) Hexokinase b) Pyruvate kinase
c) Enolase d) Phosphofructokinase-1

(xliii) Dihydroxyacetone phosphate is rapidly and reversibly converted to

- a) Glyceraldehyde 3-phosphate b) 1, 3-bis-phosphoglycerate
c) Fructose 1, 6-bisphosphate d) Fructose 6-phosphate

(xliv) Enzyme involved in the pathway of synthesis of acetyl-coA

- a) Hexokinase b) Pyruvate decarboxylase
c) Pyruvate dehydrogenase d) Pyruvate kinase

(xlv) The TCA cycle is an oxidative pathway requiring oxygen for operation. The enzyme which consumes oxygen during the operation of the cycle is

- a) isocitrate dehydrogenase b) ? ketoglutarate dehydrogenase
c) acotinase d) none of these

(xlvi) The effect of increased levels of hydrogen ions in the inter-membrane space of the mitochondria is

- a) Increase ATP production b) Decreased levels of oxidative phosphorylation
c) Increased levels of water in inter-membrane space d) Decreased levels of chemiosmosis

(xlvii) Electron accepted from FADH₂ in electron transport chain by

- a) Flavin mononucleotide b) Ubiquinone
c) Cytochrome c d) Cytochrome a

(xlviii) Number of chiral centers in isoleucine is

- a) 1
- b) 2
- c) 3
- d) 4

(xlix) Which of the following are known as helix breakers?

- a) Proline
- b) Valine
- c) Isoleucine and leucine
- d) Threonine

(l) In Sickle cell anemia

- a) Glutamic acid is replaced with valine in hemoglobin ? chain
- b) Glutamic acid is replaced with valine in hemoglobin ? chain
- c) Valine is replaced with Glutamic acid in hemoglobin ? chain
- d) Valine is replaced with Glutamic acid in hemoglobin ? chain

(li) In gel filtration chromatography, separation of proteins are based on their

- a) Size and net charge
- b) size and specific affinity
- c) size and shape
- d) shape and net charge

(lii) Increased dietary uptake of trans fatty acid causes blood level

- a) Increase of HDL
- b) Increase of LDL
- c) Increase of LDL and decrease of HDL
- d) Increase of HDL and decrease of LDL

(liii) Which of the following is a cyclic fatty acid?

- a) Cerebronic acid
- b) Ricinoleic acid
- c) Chaulmoorgic acid
- d) Oleic acid

(liv) Which of the following is NOT an essential fatty acid?

- a) Linoleic acid
- b) Linolenic acid
- c) Arachidonic acid
- d) None of these

(lv) Which out of the following is a storage form of lipid?

- a) Phospholipid
- b) Glycolipid

c) Triacyl glycerol

d) Sulfolipid

(lvi) Choose the monounsaturated fatty acid out of the following

a) Oleic acid

b) Linoleic acid

c) Linolenic acid

d) Stearic acid

(lvii) Dietary triacylglycerols are transported from intestine to hepatic and extra hepatic tissues by which of the following lipoproteins?

a) Chylomicrons

b) VLDL

c) LDL

d) HDL

(lviii) All are non -essential fatty acids except

a) Oleic acid

b) Linolenic

c) Palmitic acid

d) Stearic acid

(lix) For which out of the following compounds cholesterol does not serve as a precursor?

a) Bile pigments

b) Bile salts

c) Vitamin D

d) Sex hormones

(lx) The normal level of serum Total cholesterol is

a) 150-220 mg/dl

b) 100-200 mg/dl

c) 1.5-2.5g/dl

d) 20-40 mg/dl