



BRAINWARE UNIVERSITY

Term End Examination 2020 - 21

Programme – Bachelor of Science (Honours) in Biotechnology

Course Name – Biochemistry & Metabolism

Course Code - BBT302

Semester / Year - Semester III

Time allotted : 85 Minutes

Full Marks : 70

[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 70=70

1. (Answer any Seventy)

(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) In which of the following forms Glucose is use in bacterial cell membrane?

- | | |
|-------------|--------------|
| a) Starch | b) Dextrins |
| c) Glycogen | d) Cellulose |

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

- | | |
|-------------|---------------------|
| a) Starch | b) Keratan sulphate |
| c) Glycogen | d) Cellulose |

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

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

(vi) Starch is made up of repeating units of

- a) 1-4 linkage between glucose units
- b) 1-2 linkage between glucose units
- c) 1-5 linkage between glucose units
- d) 1-3 linkage between glucose units

(vii) Amylose has

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

(viii) In N-glycosylation, sugars are attached to ----

- a) Nitrogen
- b) Oxygen
- c) Hydrogen
- d) None of these

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

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

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

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

(xi) The enzyme which consumes oxygen during TCA cycle is

- a) citrate synthase
- b) α ketoglutarate dehydrogenase
- c) acotinase
- d) none of these

(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

c) Increased levels of water in inter-membrane space

phosphorylation

d) Decreased levels of chemiosmosis

(xiv) 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

(xv) Number of chiral centers in threonine is

a) 1

b) 2

c) 3

d) 4

(xvi) A nucleoside consists of

a) Nitrogenous base

b) Purine or pyrimidine base + sugar

c) Purine or pyrimidine base + phosphorous

d) Purine or pyrimidine base + sugar + Phosphorous

(xvii) De novo synthesis of purine nucleotide occurs in

a) Mitochondria

b) Cytosol

c) Microsomes

d) Ribosomes

(xviii) At isoelectric pH, an amino acids has

a) positive charge

b) negative charge

c) no net charge

d) all of these

(xix) Acidic and basic amino acids are

a) hydrophilic

b) hydrophobic

c) neutral

d) all of these

(xx) 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

(xxi) The sugar molecule in a nucleotide is

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

(xxii) The following coenzyme is a nucleotide

- a) FAD
- b) CoASH
- c) NAD⁺
- d) All of them

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

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

(xxiv) The nitrogenous base not present in DNA structure

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

(xxv) Which of the following statement is true?

- a) Cholesterols are present in both plants and animals
- b) Sterol is the only type of cholesterol in plants
- c) Cholesterols are not found in plants
- d) Blood of female individuals do not contain LDL

(xxvi) 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

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

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

(xxviii) Which of the following is a Sphingophospholipid?

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

(xxix) 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

(xxx) All are non -essential fatty acids except

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

(xxxii) 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

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

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

(xxxiiii) The essential amino acids

- a) histidine
- b) isoleucine
- c) leucine
- d) all of these

(xxxiv) Glycerol is present in-

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

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

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

(xxxvi) One aromatic amino acid

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

(xxxvii) Name the coenzyme of riboflavin (B2)?

- a) NAD or NADP
- b) FAD and FMN
- c) Coenzyme A
- d) Thiamine pyrophosphate

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

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

(xxxix) 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

(xl) Oxidative phosphorylation occurs in

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

(xli) Which of the following is not a disaccharide?

- a) Fructose
- b) Maltose

c) Lactose

d) Sucrose

(xlii) Sucrose is composed of which two sugars?

a) Glucose and Glucose

b) Glucose and Fructose

c) Glucose and Galactose

d) Fructose and Galactose

(xliii) In which of the following forms Glucose is stored in plants

a) Starch

b) Dextrins

c) Glycogen

d) Cellulose

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

a) Starch

b) Heparin

c) Glycogen

d) Cellulose

(xlv) Which of the following Mucopolysaccharides is non sulfated and most abundant in tissues?

a) Hyaluronic acid

b) Keratan sulphate

c) Heparin

d) Dermatan sulphate

(xlvi) 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

(xlvii) 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

(xlviii) Amylopectin has

a) 1-4 and ?-1-6 linkage

b) 1-2 linkage

c) 1-4 and ?-1-3 linkage

d) 1-3 linkage

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

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

(l) 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

(li) The substrate used in the last step of glycolysis is

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

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

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

(liii) In Kreb's 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

(liv) Most enzymes that take part in Kreb's cycle are located in

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

(lv) 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

(lvi) 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

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

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

(lviii) Number of chiral centers in isoleucine is

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

(lix) What is the maximum wavelength that Tryptophan and tyrosine absorb?

- a) 260nm
- b) 257nm
- c) 280nm
- d) 230nm

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

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

(lxi) 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

(lxii) 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

(lxiii) 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

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

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

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

- a) Phospholipid
- b) Glycolipid
- c) Triacyl glycerol
- d) Sulfolipid

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

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

(lxvii) 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

(lxviii) All are non -essential fatty acids except

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

(lxix) 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

(lxx) The normal level of serum Total cholesterol is

a) 150-220 mg/dl

c) 1.5-2.5g/dl

b) 100-200 mg/dl

d) 20-40 mg/dl