BRAINWARE UNIVERSITY

Term End Examination 2019 - 20

Programme – Bachelor of Science Honours in Biotechnology

Course Name – Biochemistry and Metabolism

Course Code – BBT302

(Semester – 3)

Time allotted: 3 Hours | 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) 20 x 1 = 20

1. *Choose the correct alternative from the following* (Answer any Twenty)

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

a. Fructose b. Maltose

c. Lactose d. Sucrose

(ii) Sucrose 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 following is not a homopolysaccharide?

a. Starch b. Heparin

c. Glycogen d. Cellulose

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

a. Hexokinase b. Pyruvate kinase

c. Enolase d. Phosphofructokinase-1

(v) 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

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

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

(vii) 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

(viii) 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

(ix) 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. α ketoglutarate dehydrogenase
c. acotinase
d. none of the above

(x) 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

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

a. Flavin mononucleotide
b. Ubiquinone
c. Cytochrome c
d. Cytochrome a

(xii) biological redox reaction always involves

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

(xiii) 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

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

a. 260nm
b. 257nm
c. 280nm
d. 230nm

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

a. Proline
b. Valine
c. Isoleucine and leucine
d. Threonine

(xvi) 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

(xvii) What is the composition of nucleotide?

a. a sugar + a phosphate
b. a base + a sugar
c. a base + a phosphate
d. a base + a sugar + phosphate

(xviii) The sugar molecule in a nucleotide is

a. Pentose
b. Hexose
c. Tetrose
d. Triose

(xix) Which of the following is true about phosphodiester linkage?

a. 5'-phosphate group of one nucleotide unit is joined to the 3'-hydroxyl group of the next nucleotide
b. 5'-phosphate group of one nucleotide unit is joined to the 5'-hydroxyl group of the next nucleotide
c. 3'-phosphate group of one nucleotide unit is joined to the 5'-hydroxyl group of the next nucleotide
d. 3'-phosphate group of one nucleotide unit is joined to the 3'-hydroxyl group of the next nucleotide

(xx) One of the following nucleic acids has a left handed helix

a. M-RNA
b. A-DNA
c. T-RNA
d. Z-DNA

(xxi) Which of the following options is true about Z-DNA helix?

a. It has alternating GC sequences
b. It tends to be found at the 3' end of the genes
c. It is a permanent conformation of DNA
d. It has fewer base pairs per turn than B-DNA

(xxii) Which of the following options 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

(xxiii) 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

(xxiv) All are non -essential fatty acids except

a. Oleic acid
b. Linolenic
c. Palmitic acid
d. Stearic acid

(xxv) 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

Group – B

(Short Answer Type Questions) 4 x 5 = 20

Answer any *four* from the following

2. Write a short note about on protein tertiary structure. 5
3. Discuss Mucopolysaccharide structure and function. 5
4. Write a short note about on protein secondary structure. 5
5. Write a short note about on dextran. 5
6. Write a short note about on cation exchange Chromatography. 5
7. What is salting in and salting out protein solubility? 5

Group – C

(Long Answer Type Questions) 3 x 10 = 30

Answer any *three* from the following

8.	(a)	Why do NADH and FADH2 produce different amounts of ATP?	2
	(b)	Explain how many molecules of ATP are produced from one molecules of glucose during aerobic respiration.	8
9.	(a)	What is branched Chain polysaccharide?	2
	(b)	Write a note about protein glycosylation	8
10.	(a)	Write down the method of salting in and salting out of proteins precipitation	6
	(b)	How would dialysis be used to remove salts after proteins precipitation?	4
11.	(a)	How Glucose 6-Phosphate is metabolized by the Pentose Phosphate Pathway?	6
	(b)	What is the significance of Pentose Phosphate Pathway?	4
12.	(a)	Why is the Krebs cycle aerobic?	2
	(b)	What is the importance of Krebs cycle?	3
	(c)	What are energy producing steps of glycolysis?	5
