2025/06

BACHELOR OF PHYSIOTHERAPY
SECOND SEMESTER
BIOCHEMISTRY
BPT – 205

SET B

[USE OMR SHEET FOR OBJECTIVE PART]

Duration: 3 hrs. **Full Marks: 70**

Objective

Time: 30 min. **Marks: 20**

Choose the correct answer from the following: ***1×20=20***

1. Which fat-soluble vitamin functions as a powerful antioxidant?
   a. Vitamin A
   b. Vitamin D
   c. Vitamin E
   d. Vitamin K

2. Which vitamin deficiency causes scurvy?
   a. Vitamin A
   b. Vitamin D
   c. Vitamin C
   d. Vitamin K

3. Which glycolytic enzyme uses NAD^+ as a coenzyme?
   a. Hexokinase
   b. Glyceraldehyde-3-phosphate dehydrogenase
   c. Phosphoglycerate kinase
   d. Enolase

4. How many net ATP molecules are produced per glucose molecule during glycolysis?
   a. 2
   b. 4
   c. 6
   d. 8

5. The Cori cycle is most active under which physiological condition?
   a. After a carbohydrate-rich meal
   b. During prolonged fasting
   c. During intense anaerobic exercise
   d. During REM sleep

6. During anaerobic glycolysis in muscle, which molecule is primarily exported to the liver in the Cori cycle?
   a. Pyruvate
   b. Glucose
   c. Lactate
   d. Alanine

7. Which intermediate of the TCA cycle can be used for gluconeogenesis via conversion to phosphoenolpyruvate (PEP)?
   a. Succinyl-CoA
   b. Malate
   c. Citrate
   d. Fumarate

8. What is the total ATP (or ATP equivalents) yield from one turn of the Krebs cycle per acetyl-CoA oxidized?
   a. 10 ATP
   b. 12 ATP
   c. 8 ATP
   d. 6 ATP

9. Which molecule donates electrons to Complex I of the ETC?
   a. $FADH_2$
   b. NADH
   c. Cytochrome c
   d. Ubiquinone

10. What is the final electron acceptor in the ETC?
   a. NAD^+
   b. FAD
   c. Oxygen
   d. Water

11. Which complex in the ETC does not pump protons across the membrane?
   a. Complex I
   b. Complex II
   c. Complex III
   d. Complex IV

12. Which of the following is a common symptom of hyperkalemia?
   a. Muscle cramps
   b. Bradycardia
   c. Tetany
   d. Constipation

13. Which coenzyme is required for the synthesis of fatty acids?
   a. NAD^+
   b. FAD
   c. NADPH
   d. CoA

14. Ketone bodies are produced in the liver primarily from:
   a. Glucose
   b. Amino acids
   c. Acetyl-CoA
   d. Pyruvate

15. Which of the following nutrients provides the most energy per gram?
   a. Carbohydrates
   b. Proteins
   c. Fats
   d. Vitamins

16. Which mineral is essential for the formation of thyroid hormones?
   a. Iodine
   b. Zinc
   c. Iron
   d. Magnesium

17. Which of the following sugars is a non-reducing sugar?
   a. Maltose
   b. Lactose
   c. Sucrose
   d. Cellobiose

18. Which of the following buffer systems is most important for maintaining intracellular pH?
   a. Bicarbonate buffer
   b. Hemoglobin buffer
   c. Phosphate buffer
   d. Protein buffer

19. Which enzyme catalyzes the committed step of glycolysis?
   a. Hexokinase
   b. Glucokinase
   c. Phosphofructokinase-1 (PFK-1)
   d. Pyruvate kinase

20. Which vitamin is required for the conversion of homocysteine to methionine?
   a. Vitamin B1
   b. Vitamin B6
   c. Vitamin B2
   d. Vitamin B12

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Descriptive

Time : 2 hrs. 30 min. **Marks : 50**

[Answer question no.1 & any four (4) from the rest]

1. Define Glycolysis in detail. **10**

2. Write about Acid-base balance in our body in detail. **10**

3. Classify the vitamins and their use with examples. **10**

4. Differentiate between DNA and RNA with their structures. **10**

5. Write the whole process of gluconeogenesis **10**

6. Define Kreb cycle and ETC. **10**

7. Write about enzymes actions and Classify them. **10**

8. Write the process of absorption of digested food. **10**

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