

Question Bank Zoology Paper VI Biochemistry

Nucleic Acids

1. In DNA double helix, the two DNA chains are held together by _____.
 - A. Covalent bonds between the complementary basepairs
 - B. Hydrogen bonds between the complementary base pairs
 - C. Ionic bonds between the complementary basepairs
 - D. None of the above
2. The 5' and 3' numbers are related to the
 - A. Length of the DNA strand
 - B. Carbon number in sugar
 - C. The number of phosphates
 - D. The base pair rule
3. In DNA, there are
 - A. Five bases known as adenine, guanine, thymine, tryptophan and cytosine
 - B. Four bases known as adenine, guanine, thymine and cytosine
 - C. Three bases known as adenine, guanine and cytosine
 - D. Only two bases known as adenine and cytosine
4. In DNA, guanine pairs with
 - A. Adenine
 - B. Cytosine
 - C. Thymine
 - D. Uracil
5. Which of the following is incorrect about DNA?
 - A. Two strands of the DNA are anti parallel to each other.
 - B. Adenine always pairs with thymine.
 - C. Guanine always pairs with the cytosine.
 - D. None of the above
6. If one cell has 40% A-T content, what will be the percentage of Guanine residue?
 - A. 60%
 - B. 15%
 - C. 30%
 - D. Guanine residue can't be calculated

7. Which of the following is the smallest of the RNAs?
 - A. Messenger RNA
 - B. Transfer RNAs
 - C. Ribosomal RNAs
 - D. All of these
8. What is the average size of a mature t-RNA?
 - A. 70 to 100 bases
 - B. 100 to 120 bases
 - C. 120 to 140 bases
 - D. 140 to 160 bases
9. What modified base is present at the 5' extremity of a capped eukaryotic m-RNA?
 - A. 1-methyl-guanosine
 - B. 3-methyl-guanosine
 - C. 5-methyl-guanosine
 - D. 7-methyl-guanosine
10. What is the function of messenger RNA?
 - A. It carries amino acids
 - B. It is a component of the ribosomes
 - C. It carries information about amino acid sequence in a protein
 - D. It is the genetic material of some organisms
11. Which of following RNA contains unusual purines and pyrimidines?
 - A. rRNA
 - B. tRNA
 - C. mRNA
 - D. None of the above
12. The anticodon is a structure on a
 - A. rRNA
 - B. ribosome
 - C. mRNA
 - D. tRNA
13. The genetic material of retroviruses such as HIV is
 - A. DNA
 - B. RNA
 - C. protein

- D. all of these
14. In deoxyribose sugar one oxygen atom is less at position _____
- 1' carbon atom
 - 2' carbon atom
 - 3' carbon atom
 - 4' carbon atom
15. Double helical structure of DNA was explained by _____ in 1953.
- J. D. Watson
 - F. H. C. Crick
 - Watson & Crick
 - None of the above
16. In a double stranded DNA molecule guanine forms _____ hydrogen bonds with cytosine.
- 1
 - 2
 - 3
 - 4
17. In a double stranded DNA molecule adenine forms _____ hydrogen bonds with thymine.
- 1
 - 2
 - 3
 - 4
18. In a DNA sample, there is 20% Adenine, what will be the percentage of cytosine?
- 20 %
 - 30 %
 - 40 %
 - 60 %
19. In a DNA sample, there is 30% guanine, what will be the percentage of thymine?
- 20 %
 - 30 %
 - 40 %
 - 60 %
20. Each turn of DNA helix has a length of _____.
- 24 Å
 - 28 Å

- c. 34 \AA
 - d. 36 \AA
21. Total width/diameter of DNA double helix is _____.
- a. 20 \AA
 - b. 10 \AA
 - c. 34 \AA
 - d. 3.4 \AA
22. A nucleoside is formed by the combination of _____.
- a. Sugar + Nitrogenous base
 - b. Sugar + phosphoric acid
 - c. Phosphoric acid+ Nitrogenous base
 - d. Sugar+ nitrogenous base + phosphoric acid
23. A nucleotide is formed by the combination of _____.
- a. Sugar + Nitrogenous base
 - b. Sugar + phosphoric acid
 - c. Phosphoric acid+ Nitrogenous base
 - d. Sugar+ nitrogenous base + phosphoric acid
24. The bond or linkage between two sugar molecules formed by phosphate group is called as _____.
- a. Glycosidic bond
 - b. Peptide bond
 - c. Phosphodiester bond
 - d. Ester bond
25. The attachment of purine base to the carbon 1' of the sugar is through position _____.
- a. 1
 - b. 3
 - c. 6
 - d. 9
26. Attachment of a pyrimidine to carbon 1' of sugar is through position _____.
- a. 1
 - b. 3
 - c. 6
 - d. 9
27. Ribonucleic acid (RNA) does not contain _____.
- a. Uracil

- b. Adenine
 - c. Cytosine
 - d. Thymine
28. Ribose sugar is a _____.
- a. Triose
 - b. Tetrose
 - c. Pentose
 - d. Hexose

Carbohydrate Metabolism

1. What is glycolysis?
 - A. Utilization of glucose
 - B. synthesis of glucose
 - C. synthesis of glycogen
 - D. breakdown of glycogen
2. Which of the following is the first enzyme of glycolysis?
 - A. Pyruvate dehydrogenase
 - B. Phosphofructokinase
 - C. Hexokinase
 - D. None of the above
3. Which enzyme converts pyruvate to lactate?
 - A. Pyruvate kinase
 - B. Pyruvate dehydrogenase
 - C. Pyruvate carboxylase
 - D. Enolase
4. Which hormone stimulates glycolysis?
 - A. Insulin
 - B. Glucagon
 - C. Growth hormone
 - D. All of the above
5. Which hormone inhibits glycolysis?
 - A. Insulin

- B. Glucagon
 - C. Growth hormone
 - D. All of the above
6. Glycolysis is also known as?
- A. Kreb's cycle
 - B. Respiratory cycle
 - C. Embden Meyerhof pathway
 - D. HMP-shunt
7. Which process shares the same pathway as glycolysis but in opposite direction?
- A. Glycogenesis
 - B. Gluconeogenesis
 - C. Glycogenolysis
 - D. HMP-shunt
8. Which of the following statement is NOT true about glycolysis?
- A. It occurs in cytoplasm of the cell
 - B. It also helps in fructose metabolism
 - C. Glycolysis generates ATP
 - D. Glycolysis generates CO₂
9. Which of the following enzymes participate in first phase of glycolysis?
- A. Hexokinase
 - B. Phospho-fructokinase
 - C. Aldolase
 - D. All of the above
10. Hexokinase is — dependent enzyme.
- A. Zinc
 - B. Magnesium
 - C. sodium dependent
 - D. Iron
11. TCA cycle is also known as?
- A. Citric acid cycle
 - B. Kreb's cycle
 - C. Both
 - D. None

12. Which is the first compound formed in the TCA cycle?
 - A. Oxaloacetate
 - B. Citrate
 - C. Isocitrate
 - D. None of the above
13. The TCA cycle occurs in?
 - A. Mitochondrial matrix
 - B. Cytosol
 - C. Nucleus
 - D. Ribosomes
14. Which compound generates acetyl-Co A?
 - A. Lactate
 - B. Pyruvate
 - C. Glucose
 - D. Fructose
15. Which enzyme catalyzes the conversion of isocitrate to alpha-ketoglutarate?
 - A. Isocitrate dehydrogenase
 - B. Isocitrate carboxylase
 - C. Alpha-ketoglutarate dehydrogenase
 - D. Aldolase
16. For _____ biomolecule/s the TCA cycle is the final common oxidative pathway.
 - A. Carbohydrates
 - B. Fats
 - C. Amino acids
 - D. All of the above
17. Which of the following reaction requires FAD as hydrogen acceptor?
 - A. Fumaric acid to Malic acid
 - B. Succinic Co A to Succinic acid
 - C. Succinic acid to fumaric acid
 - D. None of these
18. Which of the following statement is NOT true about Kreb's cycle?
 - A. It occurs in mitochondria matrix of the cell
 - B. It also helps in fructose metabolism

- C. TCA cycle generates ATP
 D. TCA cycle generates O₂
19. There is no direct participation of oxygen in the Krebs's cycle, but the cycle operates only in aerobic conditions. Why?
- A. Oxaloacetate is generated only in presence of oxygen
 B. FAD is generated only in presence of oxygen
 C. NAD is generated only in presence of oxygen
 D. Both B and C
20. The process of Glycolysis occurs in _____.
- a. Ribosomes
 b. Golgi complex
 c. Cytoplasm
 d. Mitochondria
21. The enzymes of TCA cycle are located in _____.
- a. Endoplasmic Reticulum
 b. Golgi complex
 c. Ribosomes
 d. Matrix of mitochondria
22. The formation of new glucose molecule from non-carbohydrate precursor compound is called as
- a. Glycolysis
 b. Glycogenesis
 c. Gluconeogenesis
 d. None of these

Lipid Metabolism

1. What is lipogenesis?
- A. synthesis of lipid
 B. catabolism of phospholipid
 C. synthesis of fatty acids
 D. catabolism of fatty acids
2. Which fatty acid contains 16 carbon skeleton?
- A. Palmitic acid
 B. glutamic acid
 C. Lauric acid
 D. Myristic acid
3. Where does lipogenesis takes place?
- A. cytoplasm
 B. mitochondria
 C. ribosomes
 D. nucleus

4. In which organ, lipogenesis occur mostly?
- A. liver
B. lungs
C. mammary glands
D. both A and C
5. Which of the following statement is NOT true?
- A. lipogenesis is same as lipolysis
B. fatty acids are synthesized from acetyl-CoA.
C. Insulin activates the acetyl-CoA carboxylase enzyme.
D. Glucagon inhibits the acetyl-CoA carboxylase enzyme.
6. Which type of diet inhibits lipogenesis?
- A. carbohydrate rich
B. fat rich diet
C. protein rich diet
D. all of the above
7. How many enzymatic sites does fatty acid synthase complex have?
- A. 8
B. 6
C. 7
D. 5
8. Which form of energy is required for the conversion of acetyl-CoA to malonyl-CoA?
- A. NADH
B. GTP
C. AMP
D. ATP
9. Which of the following is correct sequence of reactions occurring on enzyme fatty acid synthase complex?
- A. condensation-reduction-dehydration-reduction-Translocation
B. dehydration-reduction-condensation-reduction-Translocation
C. reduction-condensation-dehydration-reduction-Translocation
D. reduction-condensation-reduction-dehydration-Translocation
10. Synthesis of fatty acids begins from which compound?
- a. acyl-CoA
b. acetyl-CoA
c. phospholipid
d. lipoproteins
11. Carboxyl group of bicarbonate is transferred to _____ molecule of Acetyl Co A carboxylase enzyme during Malonyl Co A synthesis.
- a. Biotin carrier protein
b. Biotin Carboxylase
c. Transcarboxylase
d. Biotin

12. β oxidation takes place in _____.
- A. cytosol
B. mitochondria
C. ribosomes
D. nucleus
13. Activation of fatty acid for β oxidation requires _____.
- A. NADH
B. GTP
C. AMP
D. ATP
14. Transport of fatty acyl Co A to mitochondrial matrix for β oxidation is brought about by ___?
- A. Carnitine acyl transferase
B. Fatty acid synthase
C. Fatty acyl Co A synthetase
D. None of the above
15. β oxidation is completed in _____ steps.
- A. 1
B. 3
C. 4
D. 7
16. Acetyl CoA is converted into malonyl CoA with the help of enzyme _____.
- A. Acetyl CoA synthase
B. Acetyl CoA Carboxylase
C. Acetyl CoA reductase
D. Thioesterase
17. How many carbons are removed from fatty acid molecule in each β oxidation cycle?
- A. 1
B. 2
C. 3
D. 4
18. Which of the following product is released from fatty acid during β oxidation cycle?
- A. Acyl CoA
B. Acetyl CoA
C. CO₂
D. H₂O

Protein Metabolism

1. In which form ammonia is disposed in the liver?
- A. Urea
B. Uric acid
C. Bile
D. All of the above
2. Urea is formed from which toxic material?
- A. CO₂
B. Ammonia
C. Uric acid
D. All of the above
3. Urea cycle provides intermediate for which pathway?

- A. Glycolysis
 - B. HMP-shunt
 - C. TCA cycle
 - D. Gluconeogenesis
4. Where does urea cycle occur?
- A. Heart cells
 - B. Liver cells
 - C. Kidney cells
 - D. Heart
5. From where are the two amino groups of urea derived?
- A. both derived from ammonia
 - B. Both derived from aspartate
 - C. One from ammonia and one from aspartate
 - D. None of the above
6. Which of the following is the rate limiting step of urea cycle?
- A. Synthesis of citrulline
 - B. Synthesis of carbamoyl phosphate
 - C. synthesis of arginine
 - D. Synthesis of ornithine
7. Which of the following is the first reaction of urea cycle?
- A. Formation of ornithine
 - B. Formation of urea
 - C. Formation of arginosuccinate
 - D. Formation of citrulline
8. How many ATP are required for the formation of carbamoyl phosphate?
- A. 2
 - B. 3
 - C. 4
 - D. 1
9. Carbamoyl phosphate donates its phosphate group to which compound to form citrulline?
- A. Arginosuccinate
 - B. Ornithine
 - C. Fumerate
 - D. Urea

10. Which of the following compound/s is/are intermediate/s of urea cycle?

A. Argininosuccinate

B. Ornithine

C. Citrulline

D. All of the above

11. Which of the following is the significance of urea cycle?

A. Regulates BP

B. Regulates blood volume

C. Regulate blood flow

D. Regulate blood Ph

12. What enhances urea synthesis?

A. increased level of N-acetyl glutamate (NAG)

B. Decreased level of NAG

C. Protein rich diet

D. Both A and C