Yashwantrao Chavan College of Science, Karad.

B.Sc. Part II Zoology

Paper- VI (Biochemistry)

Question Bank

Multiple choice questions

1. Urea is also called ----------.
   a) carbohydrate b) carboxyl group
   c) amino group d) carbamide

2. Synthesis of carbamoyl phosphate takes place in the ----------of the liver cells.
   a) nucleus b) mitochondria
   c) lysosomes d) Golgi complex

3. To produce one urea molecule --------- molecules are used.
   a) 4 ATP b) 5 ATP
   c) 6 ATP d) 7 ATP

4. The enzyme arginase is found only in the ---------cells.
   a) liver b) kidney
   c) heart d) brain

5. The urea cycle is also called----------.
   a) Kreb's cycle b) ornithine cycle
   c) glycogenolysis d) glycolysis

6. The first enzyme discovered was amylase, by----------.
   a) Anselem Payen b) F.W. Kuhne
   c) James Sumner d) Edward Buchner

7. DNA strands are composed of monomers called----------.
   a) nucleotides b) nucleosides
   c) nuclein d) none of these

8. In cell ---------- is the site of biosynthesis of Ribosomal RNA.
   a) Nucleolus b) Cytoplasm
   c) Endoplasmic reticulum d) Golgi complex

9. The bond formed by sugar molecule and phosphate group is called as ---------- bond.
   a) phosphodiester bonds b) glycosidic bonds
   c) diester bonds d) covalent bonds

10. -------- found in the ribosomes.
   a) rRNA b) mRNA
   c) tRNA d) hnRNA

11. Each of the --------- naturally occurring amino acids undergoes its own metabolism.
   a) 10 b) 20
   c) 30 d) 40

12. The transfer of amino (~NH2) group from an amino acid to a keto acid is known as --------.
   a) transamination b) deamination
   c) glycogenolysis d) glycolysis

13. The removal of amino group from the amino acids is ----------.
   a) transamination b) deamination
   c) glycogenolysis d) glycolysis

14. The multiple forms of enzyme in the same organism and with similar activity are--------.
   a) Allosteric enzymes b) Isoenzymes
   c) Co enzymes d) Pro-Enzyme

15. Lock and Key Hypothesis was put forward by ----------.
   a) Edward Buchner b) F.W. Kuhne
   c) James Sumner d) Emil Fischer

16. In enzyme reaction, ---------- is also called end-product inhibition.
   a) Competitive inhibition b) Non-Competitive inhibition
   c) Feedback inhibition d) Allosteric Modulation

17. The enzymes of TCA cycle are located in --------
   a) Ribosomes b) endoplasmic reticulum
   c) Golgi complex d) matrix of mitochondria

18. ---------- is the net gain of ATP during the conversion of glucose to pyruvate.
   a) 2 ATP b) 4 ATP
   c) 6 ATP d) 1 ATP +1 GTP

19. Fatty acid synthase is enzyme complex in fatty acid synthesis catalyzes ---- number of reactions.
   a) 6 b) 7
   c) 5 d) 4

20. Induced-Fit Theory was proposed by ----------.
    a) Edward Buchner b) F.W. Kuhne
    c) James Sumner d) Koshland

21. Only a small portion of enzyme is active and is called ---------.
    a) allosteric sites b) active site
    c)effectors d) modulators

22. ---------- glucose transporters are important in fructose transport in the intestine.
    a) GLUT5 b) GLUT 3
    c)GLUT4 d) GLUT7

23. -------- is a milk sugar.
    a) Maltose b) galactose
    c) mannose d) lactose

24. Fatty acid synthase (FAS) is the enzyme complex composed of --------number of enzymes.
    a) 4 b) 7
    c) 3 d) 5

25. --------- is lipolysis.
    a) Hydrolysis of triacylglycerol b) Formation of lipids
    c) Breakdown of ketone bodies d) Formation of ketone bodies.

26. The ------ is rate limiting step in the oxidation of fatty acid in the mitochondria.
    a) carnitine shuttle b) acetyl CoA Carboxylase
    c) NADPH D d) acetyl CoA

27. --------is the simple lipid.
    a) Lecithin b) Fatty acid
    c) Triacylglycerol d) Steroids

28. A process of β oxidation is stopped by ------ enzymes of fatty acid synthesis.
    a) acetyl CoA b) malonyl CoA
    c) acetyl CoA ACP trans acylase d) B ketoacyl ACP

29. A fatty acid that is not synthesized in man is---------
    a) Linoleic acid b) Oleic acid
    c) Palmitic acid d) Stearic acid

30. ----------is the most active organs in the animal body which have the ability to synthesize triacylglycerol.
    a) Spleen b) Kidney
    c) Liver and intestines d) Adipose tissues

31. A deficiency of choline in the diet causes abnormalities in the metabolism of----------
    a) Carbohydrates b) Proteins
    c) Minerals d) Lipids.

32. The formation of new glucose molecule from non –carbohydrate precursor compound is called as -------
    a) glycolysis b) glycogenesis
    c) gluconeogenesis d) none of these

33. ---------- enzyme is known as the rate-limiting step in glycolysis.
    a) Enolase b) Phosphofructokinase
    c) Phosphohexose isomerase d) Glyceraldehyde-3-phosphate Dehydrogenase

34. Enzymes are basically formed of----------.
    a) amino acids b) lipids
    c) Carbohydrates d) nucleoproteins

35. ---------- is water insoluble carbohydrate.
    a) Glucose b) Cellulose
    c) Sucrose d) Fructose

36. ---------- enzymes is not involved in galactose metabolism.
    a) Galactokinase b) Glucokinase
    c) Galactose-1-Phosphate Uridyl transferase d) UDP-Galactose 4- epimerase

37. --------is example of polysaccharide.
    a) Maltose b) Glucose
    c) Starch d) Fructose.

38. ---------- molecules of ATP are synthesized via glycolysis, Krebs cycle and ETS from a single molecule of glucose.
    a) 32 b) 5
    c) 38 d) 36

39. The nitrogen bases found in DNA are adenine, cytosine, guanine, and---------.
    a) uracil b) thymine
    c) inosine d) pseudouridine

40. In RNA, instead of nitrogen base thymine ---------- is present.
    a) Cytosine b) Adenine
    c) Uracil d) Guanine

41. There are ---------- hydrogen bonds in a G: C bases.
    a) 1 b) 2
    c) 3 d) 4

42. The structure of DNA was first proposed by --------in 1953.
    a) Embden & Meyerhof b) Watson and Crick
    c) Morgan & Mendel d) Franklin & Lamarck

43. A Function of carbohydrate in diet is to --------
    a) Supply lipid b) supply energy
    c) supply protein d) all of these

Long answer questions

1. Describe in detail hexose monophosphate shunt pathway.
2. Explain in brief glycolysis with its significance.
3. Explain the various reactions involved in the Kreb's cycle.
4. Explain chemical nature of enzymes.
5. Give an account of β – oxidation.
6. Define enzyme inhibition. Explain in detail the different types of inhibitions with suitable examples.
7. Explain Michaelis Menten constant.
8. Describe factors influencing enzyme activity.
9. Explain the structure and functions of Ribonucleic acid.
10. What are nucleic acids? Give the molecular structure of DNA.
11. Discuss DNA in terms of its chemical composition, structure and functions.
12. Explain the electron transport chain
13. Describe Watson and Crick model of DNA. Add a note on different forms of DNA (DNA polymorphism).
14. Explain the structure and functions of different type of RNAs.
15. Describe fatty acid synthesis in eukaryotic cell.
16. Describe the reactions of gluconeogenesis.
17. Describe in details transamination in animals.
18. Explain urea cycle of ureotelic animals.
19. Describe transportation of Acyl CoA from cell cytosol to mitochondrial matrix.
20. Describe nomenclature and classification of enzymes with suitable examples.

Short answer questions

1. Watson – crick model of DNA
2. Glycolysis
3. Gluconeogenesis
4. Glycogenolysis
5. Biological significance of DNA
6. Significance of Ornithine cycle
7. Deamination
8. Transamination
9. Cofactors
10. Classification of enzymes
11. Mechanism of Enzyme Action
12. Lock & key hypothesis
13. Induced fit hypothesis
14. Pentose Phosphate Pathway
15. β oxidation
16. Conjugated enzymes
17. Factors Influencing Enzyme Activity
18. Structure of t-RNA
19. Structure of r-RNA
20. Different forms of DNA
21. Cytochromes
22. Energetics of Kreb's cycle
23. Electron transport chain
24. Structure of m-RNA

25. Types of RNA

26. Inhibition of Enzyme Action

Seat No.

Seat No.

B.Sc. Part II SEM-III (NEP-2020) Examination, Oct-Nov 2023

Yashwantrao Chavan College of Science, Karad.

Subject: Zoology (Paper - VI)

Subject Code: 91569

Day and Date: Tuesday, 28/11/2023

Time: 10:30 am to 12:30 pm

Marks: 40

Q1. Rewrite the following sentence by choosing the correct alternatives [8]

1) The enzymes of TCA cycle are located in _____.

a) Endoplasmic reticulum
b) Golgi complex
c) Cytosol
d) Mitochondria

2) Each molecule of NADH2 yield _____ number of ATPs.

a) Three
b) Two
c) Four
d) One

3) _____ is a milk sugar.

a) Galactose
b) Lactose
c) Maltose
d) Mannose

4) _____ proved that something in the yeast cells is responsible to produce alcohol by fermentation of sugar.

a) Wilhelm Kuhne
b) Louis Pastire
c) Anselme Payen
d) Eduard Buchner

5) In urea cycle citruline is formed in the _____.

a) Cytoplasm of liver cell
b) Cytoplasm of kidney cell

c) Mitochondria of kidney cells

d) Mitochondria of liver cells

6) Which of the following is the most abundant biomolecule on the earth?

a) Proteins

b) Lipids

c) Carbohydrates

d) Nucleic acids

7) _____ amino acid is called as scavenger of ammonia.

a) Thrionin

b) Serine

c) α-ketoglutanic acid

d) Glysine

8) Glutamate dehydrogenase enzyme useful in deamination is present in _____.

a) Kidney

b) Liver cell mitochondria

c) Pancreatic acini

d) Kuffer cell

Q2. Attempt any TWO of the following [16]

i) What are carbohydrates? Explain in detail TCA cycle with significance.
ii) Explain mechanism of breakdown of fatty acids in the eukaryotic cell.
iii) Describe in detail electron transport chain (ETC) and add a note on ATP synthase complex.
iv) Explain urea cycle of ureotelic animals.

Q3. Attempt any FOUR of the following [16]

i) Transport of Acyl CoA into mitochondria.
ii) Glycolytic pathway.
iii) Lock and key hypothesis.
iv) Explain ornithine cycle.
v) Carbohydrates.
vi) Absorption of proteins.