scholareye.xyz

10th CLASS • CHEMISTRY

Chapter 13
BIOCHEMISTRY

85 Multiple Choice Questions

Answers Highlighted • Detailed Explanations

Carbohydrates • Proteins • Lipids
Nucleic Acids • Vitamins • Enzymes

Complete MCQ Bank

Learn smart. Practise more. Score higher.

www.scholareye.xyz

Section 1: Introduction & Carbohydrates

1 **Which of the following is the correct definition of Biochemistry?**

A) The study of rocks and minerals.

✔ **B) The study of chemical processes within and relating to living organisms.**

C) The study of electricity and magnetism.

D) The study of celestial bodies.

✔ Answer: B) The study of chemical processes within and relating to living organisms.

★ Explanation

Biochemistry focuses specifically on the chemical substances and reactions that occur inside living things, dealing with macromolecules like carbohydrates, proteins, lipids, and nucleic acids.

2 What is the general formula for carbohydrates?

A) $C_nH_{2n}O_n$

✔ **B) $C_n(H_2O)_n$**

C) $C_nH_nO_{2n}$

D) $C_n(OH)_n$

✔ Answer: B) $C_n(H_2O)_n$

★ Explanation

The name "carbohydrate" literally means "hydrate of carbon." The general formula $C_n(H_2O)_n$ reflects this, where carbon atoms are combined with water molecules in a specific ratio.

3 **Which gas is released as a byproduct during the photosynthesis of carbohydrates?**

A) Carbon dioxide

B) Nitrogen

✔ **C) Oxygen**

D) Hydrogen

✔ Answer: C) Oxygen

★ Explanation

During photosynthesis, plants use carbon dioxide and water in the presence of sunlight and chlorophyll to synthesize glucose, releasing oxygen gas as a byproduct.

4 **Carbohydrates are classified into how many main groups?**

A) Two

✔ **B) Three**

C) Four

D) Five

✔ Answer: B) Three

★ Explanation

Carbohydrates are broadly classified into three main categories based on their complexity: Monosaccharides (simple sugars), Oligosaccharides (few units), and Polysaccharides (many units).

5 **Which of the following is the simplest sugar that cannot be hydrolyzed?**

A) Sucrose

B) Starch

✔ **C) Monosaccharide**

D) Polysaccharide

✔ Answer: C) Monosaccharide

★ Explanation

Monosaccharides are the fundamental building blocks of carbohydrates. Because they are the simplest form, they cannot be broken down further by hydrolysis into smaller sugar units.

6 How many carbon atoms do monosaccharides generally contain?

A) 1 to 5

✔ **B) 3 to 9**

C) 10 to 15

D) 20 or more

✔ Answer: B) 3 to 9

★ Explanation

Monosaccharides are categorized by the number of carbon atoms they possess, typically ranging from 3 (trioses) to 9 (nonoses), with hexoses (6 carbons) being the most biologically important.

7 **Glucose is chemically classified as a:**

A) Polyhydroxy ketone

✔ **B) Polyhydroxy aldehyde**

C) Polysaccharide

D) Disaccharide

✔ Answer: B) Polyhydroxy aldehyde

★ Explanation

Looking at the open-chain structure of glucose in the text, it has an aldehyde group (-CHO) at the top and multiple hydroxyl (-OH) groups, making it a polyhydroxy aldehyde.

8 **Which of the following monosaccharides is a polyhydroxy ketone?**

A) Glucose

B) Galactose

✔ **C) Fructose**

D) Ribose

✔ Answer: C) Fructose

★ Explanation

Fructose contains a ketone group (C=O) on its second carbon atom along with multiple hydroxyl groups, distinguishing it structurally from glucose.

9 Why are monosaccharides and some oligosaccharides called "reducing sugars"?

A) They reduce the temperature of the solution.

✔ **B) They act as reducing agents in chemical reactions.**

C) They reduce body weight.

D) They reduce the amount of oxygen in the blood.

✔ Answer: B) They act as reducing agents in chemical reactions.

★ Explanation

Monosaccharides possess free aldehyde or ketone groups that allow them to act as reducing agents (they can donate electrons to other molecules) in various chemical tests.

10 **Which of the following is an example of an oligosaccharide?**

A) Starch

✔ **B) Sucrose**

C) Cellulose

D) Glucose

✔ Answer: B) Sucrose

★ Explanation

Oligosaccharides yield 2 to 9 units of monosaccharides upon hydrolysis. Sucrose is a disaccharide (composed of two units: glucose and fructose) and falls under this category.

11 Upon hydrolysis, sucrose yields:

A) Two units of glucose

✔ **B) One unit of glucose and one unit of fructose**

C) One unit of glucose and one unit of galactose

D) Two units of fructose

✔ Answer: B) One unit of glucose and one unit of fructose

★ Explanation

Sucrose is a disaccharide. When it is broken down by water (hydrolysis) in the presence of acid or enzymes, it splits into its constituent monosaccharides: glucose and fructose.

12 Polysaccharides are macromolecules consisting of:

A) 2 to 9 monosaccharides

✔ **B) Hundreds to thousands of monosaccharides**

C) Only 3 to 9 carbon atoms

D) Single amino acids

✔ Answer: B) Hundreds to thousands of monosaccharides

★ Explanation

Polysaccharides are complex carbohydrates. They are massive polymers formed by the linking of hundreds or thousands of simple sugar units (monosaccharides).

13 **Which of the following is a characteristic property of polysaccharides?**

A) Sweet in taste

B) Crystalline solids

✔ **C) Tasteless and insoluble in water**

D) Highly soluble in water

✔ Answer: C) Tasteless and insoluble in water

★ Explanation

Unlike simple sugars, large polysaccharides like starch and cellulose are too big to interact with taste receptors (tasteless) and do not dissolve easily in water due to their massive size and structure.

14 **Which of the following is NOT a source of simple sugars?**

A) Fruits

B) Vegetables

C) Honey

✔ **D) Cotton**

✔ Answer: D) Cotton

★ Explanation

Cotton is almost pure cellulose, which is a polysaccharide. Simple sugars (monosaccharides) are found naturally in sweet items like fruits, vegetables, and honey.

15 **Lactose is primarily found in:**

A) Cereals

B) Sugar cane

✔ **C) Milk and dairy products**

D) Fruits

✔ Answer: C) Milk and dairy products

★ Explanation

Lactose is commonly known as milk sugar. It is a disaccharide composed of glucose and galactose, naturally occurring in the milk of mammals.

16 **Which form of carbohydrate is directly used by muscles for energy?**

A) Starch

B) Glycogen

✔ **C) Glucose**

D) Cellulose

✔ Answer: C) Glucose

★ Explanation

While we eat complex carbohydrates, our digestive system breaks them down into glucose. Glucose is the only form of sugar that cells, including muscle cells, can directly use for energy.

17 **Which organ exclusively relies on glucose for energy because it cannot use fat for this purpose?**

A) Heart

B) Liver

✔ **C) Brain**

D) Kidneys

✔ Answer: C) Brain

★ Explanation

The human brain is highly metabolically active and requires a constant supply of glucose. It lacks the ability to utilize fat as an energy source, making glucose vital for brain function.

18 Carbohydrates provide approximately how much energy per gram?

A) 10 kilojoules

✔ **B) 17 kilojoules**

C) 25 kilojoules

D) 38 kilojoules

✔ Answer: B) 17 kilojoules

★ Explanation

The text explicitly states that carbohydrates provide 17 kilojoules of energy per gram, making them a primary energy source.

19 **A low sugar level in the body results in a condition called:**

A) Diabetes

B) Obesity

✔ **C) Hypoglycemia**

D) Hypertension

✔ Answer: C) Hypoglycemia

★ Explanation

The prefix "hypo-" means low, and "glycemia" refers to sugar in the blood. Therefore, low blood sugar is termed hypoglycemia.

20 How does dietary fiber help the human body?

A) It provides most of our energy.

✔ **B) It helps lower cholesterol and regulate blood pressure.**

C) It builds muscle tissue.

D) It acts as a primary source of vitamins.

✔ Answer: B) It helps lower cholesterol and regulate blood pressure.

★ Explanation

Dietary fiber (roughage) is an indigestible carbohydrate that aids in digestion, keeps the bowel functioning properly, and helps manage cholesterol levels and blood pressure.

21 Dextrose is a crystallized form of:

A) Fructose

✔ **B) Glucose**

C) Sucrose

D) Maltose

✔ Answer: B) Glucose

★ Explanation

Dextrose is simply the commercial or chemical name for pure, crystallized glucose, often used in medical and food industries.

22 **A 5% dextrose solution (D5W) contains how many grams of dextrose per 100 ml?**

✔ **A) 5 grams**

B) 10 grams

C) 50 grams

D) 100 grams

✔ Answer: A) 5 grams

★ Explanation

The "5%" indicates the concentration. A 5% solution means 5 grams of the solute (dextrose) are dissolved in 100 ml of the solvent (water).

Section 2: Proteins

23 **Proteins are highly complicated compounds made up of:**

A) Fatty acids

✔ **B) Amino acids**

C) Nucleotides

D) Simple sugars

✔ Answer: B) Amino acids

★ Explanation

Amino acids are the fundamental building blocks (monomers) that link together in long chains to form complex protein molecules.

24 **Which of the following elements is characteristic of proteins but NOT found in carbohydrates and lipids?**

A) Carbon

B) Hydrogen

C) Oxygen

✔ **D) Nitrogen**

✔ Answer: D) Nitrogen

★ Explanation

While carbohydrates and lipids contain carbon, hydrogen, and oxygen, proteins are unique because they always contain nitrogen (and sometimes sulfur).

25 **What is the name of the bond that links amino acids together?**

A) Glycosidic bond

B) Ester bond

✔ **C) Peptide linkage**

D) Hydrogen bond

✔ Answer: C) Peptide linkage

★ Explanation

The specific chemical bond formed between the carboxyl group of one amino acid and the amino group of another is called a peptide bond.

26 What process occurs to form a peptide bond between two amino acids?

A) Addition of water

✔ **B) Elimination of water**

C) Addition of oxygen

D) Elimination of carbon dioxide

✔ Answer: B) Elimination of water

★ Explanation

This is a dehydration synthesis (or condensation) reaction. As the two amino acids join, one molecule of water is removed to create the bond.

27 **Proteins make up approximately what percentage of the dry weight of animal cells?**

A) 10%

B) 25%

✔ **C) 50%**

D) 90%

✔ Answer: C) 50%

★ Explanation

Proteins are the most abundant macromolecules in cells, constituting about half (50%) of the dry weight of animal tissues, excluding water.

28 **Which of the following is NOT a component of an amino acid?**

A) Amino group

B) Carboxyl group

C) Side chain (R group)

✔ **D) Phosphate group**

✔ Answer: D) Phosphate group

★ Explanation

Amino acids consist of an amino group (-NH_2), a carboxyl group (-COOH), and a variable side chain (R group). Phosphate groups are found in nucleic acids, not standard amino acids.

29 How many standard amino acids are involved in protein synthesis?

A) 10

✔ **B) 20**

C) 64

D) 100

✔ Answer: B) 20

★ Explanation

Although there are many amino acids in nature, only 20 specific ones are commonly encoded by the genetic code to build human proteins.

30 **Amino acids that CANNOT be synthesized by the human body and must be obtained from the diet are called:**

A) Non-essential amino acids

✔ **B) Essential amino acids**

C) Complex amino acids

D) Simple amino acids

✔ Answer: B) Essential amino acids

★ Explanation

Because the body cannot manufacture them from other compounds, they are "essential" to consume in our food. (There are 10 of these).

31 Which of the following is a rich animal source of protein?

A) Beans

B) Pulses

✔ **C) Mutton**

D) Olive oil

✔ Answer: C) Mutton

★ Explanation

Mutton (meat), along with chicken, fish, and eggs, are standard animal-based sources of protein. Beans and pulses are plant-based.

32 What is the biological function of enzymes in the body?

A) To store genetic information

B) To insulate the body

✔ **C) To catalyze chemical reactions**

D) To act as a primary source of long-term energy

✔ Answer: C) To catalyze chemical reactions

★ Explanation

Enzymes are specialized proteins that act as biological catalysts. They speed up chemical reactions necessary for life without being consumed in the process.

33 **When bones are heated, they yield a protein called:**

A) Casein

✔ **B) Gelatin**

C) Collagen

D) Keratin

✔ **Answer: B) Gelatin**

★ **Explanation**

The protein collagen found in bones breaks down and forms gelatin when heated, which is commonly used in making bakery items and jellies.

34 **Which of the following is a plant source of protein?**

A) Hides

B) Eggs

✔ **C) Pulses**

D) Milk

✔ Answer: C) Pulses

★ Explanation

Pulses (like lentils and beans) are excellent plant-based sources of protein, essential for vegetarian diets.

Section 3: Lipids

35 Lipids are macromolecules made up of:

A) Amino acids

B) Nucleotides

✔ **C) Fatty acids**

D) Monosaccharides

✔ Answer: C) Fatty acids

★ Explanation

Lipids, which include oils and fats, are primarily composed of fatty acid chains attached to a glycerol backbone.

36 Chemically, fats and oils are esters of:

A) Glycerol and amino acids

✔ **B) Glycerol and fatty acids**

C) Fatty acids and glucose

D) Glycerol and phosphates

✔ Answer: B) Glycerol and fatty acids

★ Explanation

Specifically, they are triglycerides, which means one glycerol molecule esterified with three fatty acid molecules.

37 Triglycerides are composed of three fatty acids and:

A) Three glycerol molecules

✔ **B) One glycerol molecule**

C) One phosphate group

D) One nitrogen base

✔ Answer: B) One glycerol molecule

★ Explanation

The prefix "tri-" refers to the three fatty acid chains, all attached to a single central glycerol molecule.

38 **What is the main structural difference between oils and fats at room temperature?**

A) Oils are solid, fats are liquid.

✔ **B) Oils are liquid, fats are solid.**

C) Both are gases.

D) Oils are inorganic, fats are organic.

✔ Answer: B) Oils are liquid, fats are solid.

★ Explanation

Oils remain liquid at room temperature, while fats are solid. This physical difference is due to the type of fatty acids they contain.

39 Oils are triglycerides of:

A) Saturated fatty acids

✔ **B) Unsaturated fatty acids**

C) Amino acids

D) Nucleic acids

✔ Answer: B) Unsaturated fatty acids

★ Explanation

Unsaturated fatty acids have double bonds in their carbon chains that create "kinks," preventing the molecules from packing tightly, which keeps them liquid (oils).

40 **Fats are triglycerides of:**

✔ **A) Saturated fatty acids**

B) Unsaturated fatty acids

C) Simple sugars

D) Phosphates

✔ **Answer: A) Saturated fatty acids**

★ **Explanation**

Saturated fatty acids have straight carbon chains without double bonds, allowing them to pack closely together, making them solid at room temperature.

41 **Which of the following is an example of a saturated fatty acid?**

A) Oleic acid

B) Linoleic acid

✔ **C) Palmitic acid**

D) Arachidonic acid

✔ **Answer: C) Palmitic acid**

★ **Explanation**

The text lists Palmitic acid ($C_{15}H_{31}COOH$) and Stearic acid as examples of saturated fatty acids.

42 Fats and oils are high energy foods and act as carriers for which vitamins?

A) Vitamins B and C

✔ **B) Vitamins A, D, and E**

C) Vitamins C and K

D) Only Vitamin C

✔ Answer: B) Vitamins A, D, and E

★ Explanation

Fat-soluble vitamins require the presence of lipids to be absorbed and transported within the body.

43 Why does fat act as an insulator in the body?

A) It is a good conductor of heat and electricity.

✔ **B) It is a poor conductor of heat and electricity.**

C) It dissolves in water.

D) It is liquid at room temperature.

✔ Answer: B) It is a poor conductor of heat and electricity.

★ Explanation

Because fat is a poor conductor, the fat stored in adipose tissue helps trap body heat and protects internal organs, acting as a biological insulator.

44 Which type of tissue stores animal fat?

A) Muscle tissue

B) Nervous tissue

✔ **C) Adipose tissue**

D) Epithelial tissue

✔ Answer: C) Adipose tissue

★ Explanation

Adipose tissue is specialized connective tissue designed specifically to store fat in the form of triglycerides.

45 **Vegetable oils are converted to vegetable ghee through a process called:**

A) Hydrolysis

✔ **B) Hydrogenation**

C) Dehydration

D) Oxidation

✔ **Answer: B) Hydrogenation**

★ **Explanation**

Hydrogenation is the addition of hydrogen gas to unsaturated liquid oils to turn them into saturated, solid fats (ghee/margarine).

46 **Which catalyst is used during the hydrogenation of vegetable oil?**

A) Iron

B) Copper

✔ **C) Nickel**

D) Platinum

✔ Answer: C) Nickel

★ Explanation

The text specifies that nickel acts as a catalyst in this reaction, which takes place at temperatures between 250°C to 300°C.

47 **The foul smell of rancid butter is due to the presence of:**

✔ **A) Butanoic acid**

B) Palmitic acid

C) Stearic acid

D) Citric acid

✔ **Answer: A) Butanoic acid**

★ **Explanation**

When butter spoils (goes rancid), its fats break down, releasing short-chain fatty acids like butanoic acid, which have a highly unpleasant smell.

Section 4: Nucleic Acids

48 Nucleic acids are long chain molecules made up of:

A) Amino acids

✔ **B) Nucleotides**

C) Fatty acids

D) Monosaccharides

✔ Answer: B) Nucleotides

★ Explanation

Nucleotides are the monomers that polymerize to form nucleic acids like DNA and RNA.

49 **A nucleotide consists of three components. Which of the following is NOT one of them?**

A) Nitrogenous base

B) Pentose sugar

C) Phosphate group

✔ **D) Carboxyl group**

✔ Answer: D) Carboxyl group

★ Explanation

A nucleotide is composed of a nitrogenous base, a 5-carbon (pentose) sugar, and a phosphate group. Carboxyl groups are characteristic of amino acids.

50 What are the two main types of nucleic acids?

A) Starch and Cellulose

✔ **B) DNA and RNA**

C) Fats and Oils

D) Enzymes and Hormones

✔ Answer: B) DNA and RNA

★ Explanation

The two primary nucleic acids found in living organisms are Deoxyribonucleic Acid (DNA) and Ribonucleic Acid (RNA).

51 Which sugar is present in DNA?

A) Ribose

✔ **B) Deoxyribose**

C) Glucose

D) Fructose

✔ Answer: B) Deoxyribose

★ Explanation

The "Deoxy" in DNA stands for deoxyribose, which is a pentose sugar that lacks an oxygen atom on the 2' carbon compared to ribose.

52 The double-helix structure of DNA was discovered by:

A) Darwin and Mendel

✔ **B) Watson and Crick**

C) Pasteur and Koch

D) Hopkins and Funk

✔ Answer: B) Watson and Crick

★ Explanation

James Watson and Francis Crick are credited with discovering the double-helical structure of DNA in 1953.

53 DNA is responsible for:

A) Directly building proteins in the cytoplasm

✔ **B) Storing and transmitting genetic information**

C) Providing short-term energy

D) Acting as an enzyme

✔ Answer: B) Storing and transmitting genetic information

★ Explanation

DNA acts as the permanent, stable storage unit for the genetic instructions (the "genetic code of life") required to build and maintain an organism.

54 **The instructions for synthesizing proteins from amino acids are determined by the sequence of:**

A) Phosphate groups

B) Sugar molecules

✔ **C) Nitrogenous bases**

D) Hydrogen bonds

✔ Answer: C) Nitrogenous bases

★ Explanation

The specific order (sequence) of the four nitrogenous bases (A, T, C, G) along the DNA strand dictates the sequence of amino acids in a protein.

55 What is the role of RNA in the cell?

A) It stores permanent genetic information.

✔ **B) It acts as a messenger to direct protein synthesis.**

C) It forms the double helix structure.

D) It provides insulation for the cell.

✔ Answer: B) It acts as a messenger to direct protein synthesis.

★ Explanation

RNA receives instructions from DNA, reads and decodes them, and then directs the synthesis of new proteins in the cell. It is essential for putting genetic information to work.

56 Which of the following is a structural difference between DNA and RNA?

A) DNA is single-stranded, RNA is double-stranded.

B) DNA contains ribose, RNA contains deoxyribose.

✔ **C) DNA is double-stranded, RNA is single-stranded.**

D) DNA is found in the cytoplasm, RNA in the nucleus.

✔ Answer: C) DNA is double-stranded, RNA is single-stranded.

★ Explanation

DNA forms a double helix (two strands), while RNA is typically a single-stranded molecule.

57 **According to the central dogma of molecular biology shown in the text, what is the correct flow of genetic information?**

A) Protein → RNA → DNA

✔ **B) DNA → RNA → Protein**

C) RNA → DNA → Protein

D) DNA → Protein → RNA

✔ Answer: B) DNA → RNA → Protein

★ Explanation

DNA synthesizes and passes instructions to RNA, which then uses those instructions to synthesize proteins.

58 **According to the "Interesting Information" box, cancer is caused by:**

A) A lack of vitamins

✔ **B) Damage to DNA or interference with its replication**

C) Excess carbohydrate intake

D) A deficiency of RNA

✔ Answer: B) Damage to DNA or interference with its replication

★ Explanation

Mutations or damage to DNA can cause cells to grow and divide uncontrollably, leading to cancer. Understanding DNA mechanisms is key to finding a cure.

Section 5: Vitamins

59 **The term "Vitamin" was proposed by:**

A) Hopkins

✔ **B) Funk**

C) Watson

D) Crick

✔ Answer: B) Funk

★ Explanation

While Hopkins noticed the necessity of these substances (calling them accessory growth factors), it was Funk who proposed the name "Vitamin" and discovered Vitamin B1.

60 **Vitamins are required by the body in:**

A) Large quantities

✔ **B) Small quantities**

C) Macro amounts similar to carbohydrates

D) The same amount as water

✔ Answer: B) Small quantities

★ Explanation

Vitamins are micronutrients. They are essential for normal growth but are required only in very small amounts.

61 **Which of the following is a fat-soluble vitamin?**

A) Vitamin B

B) Vitamin C

✔ **C) Vitamin D**

D) Vitamin B12

✔ Answer: C) Vitamin D

★ Explanation

The fat-soluble vitamins are Vitamins A, D, E, and K. They dissolve in lipids and are stored in the body's fatty tissues.

62 **Which of the following is a water-soluble vitamin?**

A) Vitamin A

B) Vitamin K

C) Vitamin E

✔ **D) Vitamin C**

✔ Answer: D) Vitamin C

★ Explanation

Water-soluble vitamins include Vitamin C and the B-complex group. They dissolve in water and are not stored in the body long-term.

63 Why are water-soluble vitamins generally non-toxic even if taken in large amounts?

A) They are stored safely in the liver.

✔ **B) They are rapidly excreted from the body.**

C) They are converted into fat.

D) They are insoluble in blood.

✔ Answer: B) They are rapidly excreted from the body.

★ Explanation

Because they dissolve in water, excess amounts of these vitamins are filtered out by the kidneys and excreted in urine, preventing toxic accumulation.

64 Accumulation of which vitamin in large quantities can cause bone pain and bone-like deposits in the kidney?

A) Vitamin A

B) Vitamin C

✔ **C) Vitamin D**

D) Vitamin B complex

✔ Answer: C) Vitamin D

★ Explanation

Fat-soluble vitamins can accumulate to toxic levels. Excessive Vitamin D leads to hypercalcemia, causing calcium deposits (bone-like deposits) in soft tissues like the kidneys.

65 Deficiency of Vitamin A causes:

A) Rickets

B) Scurvy

✔ **C) Night blindness**

D) Beriberi

✔ Answer: C) Night blindness

★ Explanation

Vitamin A is crucial for the retina's dark adaptation mechanism. A lack of it impairs vision in low light, a condition called night blindness.

66 Which vitamin is formed in the skin when exposed to sunlight?

A) Vitamin A

B) Vitamin C

✔ **C) Vitamin D**

D) Vitamin K

✔ Answer: C) Vitamin D

★ Explanation

The body can synthesize Vitamin D when the skin is exposed to ultraviolet B (UVB) rays from the sun.

67 The deficiency of Vitamin D causes:

A) Night blindness

✔ **B) Rickets**

C) Eye inflammation

D) Blood clotting issues

✔ Answer: B) Rickets

★ Explanation

Vitamin D is essential for calcium absorption. Without it, bones become soft and weak, leading to a condition called rickets in children.

68 **Which vitamin is essential for the absorption of calcium to maintain healthy bones?**

A) Vitamin A

B) Vitamin B

C) Vitamin C

✔ **D) Vitamin D**

✔ Answer: D) Vitamin D

★ Explanation

Even if you consume enough calcium, your body cannot absorb it efficiently without the help of Vitamin D.

69 Which vitamins act as antioxidants and help maintain the health of the epithelium?

A) Vitamin C and B

✔ **B) Vitamin A and E**

C) Vitamin D and K

D) Vitamin B12 and C

✔ Answer: B) Vitamin A and E

★ Explanation

Vitamin A is explicitly mentioned as maintaining epithelium health, and Vitamin E is known as a primary antioxidant. (The table highlights Vitamin A's role in epithelium).

70 **Why is it recommended to take vitamins with meals?**

A) To make them taste better.

✔ **B) Because they cannot be assimilated without ingesting food.**

C) To prevent them from dissolving in water.

D) To increase their toxicity.

✔ Answer: B) Because they cannot be assimilated without ingesting food.

★ Explanation

The text states that vitamins must be taken with meals because the body needs the process of digestion and the presence of other food components (like fats for fat-soluble vitamins) to properly absorb them.

Section 6: Commercial Uses of Enzymes & Skills

71 **In commercial fermentation, which enzymes in yeast are used to produce alcohol from starch?**

A) Lipases and proteases

✔ **B) Diastase, invertase, and zymase**

C) Amylase and cellulase

D) Lactase and catalase

✔ **Answer: B) Diastase, invertase, and zymase**

★ **Explanation**

These specific enzymes in yeast break down complex sugars and starch into simpler sugars, which are then fermented into ethanol (alcohol).

72 **Which class of enzymes is used in detergents to break down fats into water-soluble compounds?**

A) Proteases

B) Amylases

✔ **C) Lipases**

D) Cellulases

✔ Answer: C) Lipases

★ Explanation

The prefix "lipo-" refers to fats. Lipases are enzymes that catalyze the hydrolysis of lipids (fats) into smaller, water-soluble molecules that can be washed away.

73 What is the function of cellulase in biological detergents?

A) To break down proteins.

✔ **B) To degrade cellulose into glucose.**

C) To remove starch stains.

D) To soften fabrics.

✔ Answer: B) To degrade cellulose into glucose.

★ Explanation

Cellulase targets cellulose fibers, breaking them down into water-soluble glucose, which helps remove certain types of stains and dirt from fabrics.

74 **Which enzyme is used in the food industry to increase the sweetness of ice cream?**

A) Zymase

B) Amylase

✔ **C) Lactase**

D) Protease

✔ Answer: C) Lactase

★ Explanation

Lactase breaks down lactose (milk sugar) into galactose and glucose, both of which taste sweeter than lactose, enhancing the sweetness of ice cream without adding extra sugar.

75 **In bread making, amylase enzymes are used because they:**

A) Break down proteins.

✔ **B) Convert starch to sweet glucose syrup.**

C) Act as a preservative.

D) Add color to the bread.

✔ Answer: B) Convert starch to sweet glucose syrup.

★ Explanation

Amylases break down the flour's starch into sugars. These sugars not only sweeten the bread but also provide food for yeast, helping the dough rise.

76 **According to the skills section, which of the following is true regarding the solubility of starch and sugar?**

A) Both are highly soluble in water.

B) Starch is soluble, sugar is insoluble.

✔ **C) Starch is insoluble, sugar is soluble.**

D) Both are insoluble in water.

✔ Answer: C) Starch is insoluble, sugar is soluble.

★ Explanation

Simple sugars (like glucose or table sugar) dissolve easily in water to form a clear solution, while complex starches do not dissolve in water (they may form a suspension when heated).

77 What is meant by the "denaturation of protein"?

A) The breakdown of protein into amino acids.

✔ **B) The precipitation or coagulation of protein due to heat or pH change.**

C) The synthesis of new proteins.

D) The conversion of protein into fat.

✔ Answer: B) The precipitation or coagulation of protein due to heat or pH change.

★ Explanation

Denaturation alters the three-dimensional structure of a protein, causing it to unfold and coagulate. A classic example is frying or boiling an egg, where the liquid egg white turns solid.

78 **When an egg is boiled, the albumin coagulates. Albumin is a:**

A) Carbohydrate

B) Lipid

✔ **C) Protein**

D) Nucleic acid

✔ Answer: C) Protein

★ Explanation

Albumin is the primary protein found in egg white. When exposed to heat, it undergoes denaturation, solidifying into a white, opaque mass.

79 **According to the concept diagram, which of the following is a source of lipids?**

A) Pulses

B) Cereals

✔ **C) Butter and Ghee**

D) Honey

✔ Answer: C) Butter and Ghee

★ Explanation

The concept diagram explicitly links lipids to animal sources like butter and ghee, as well as plant oils.

80 **Which of the following regulates the amount of sugar level in our body?**

A) Proteins

✔ **B) Carbohydrates**

C) Lipids

D) Vitamins

✔ **Answer: B) Carbohydrates**

★ **Explanation**

Carbohydrates play a direct role in regulating blood sugar levels. Low levels result in hypoglycemia, while excess can be converted to glycogen or fat.

81 **Which of these is a primary function of proteins according to the concept diagram?**

A) Act as an energy source only.

✔ **B) Form protoplasm and act as enzymes.**

C) Insulate the body.

D) Store genetic information.

✔ Answer: B) Form protoplasm and act as enzymes.

★ Explanation

The concept diagram lists forming protoplasm, acting as catalysts (enzymes), and forming structural components (leather, gelatin) as primary uses of proteins.

82 **In the synthesis of vegetable ghee, what is the state of the fatty acids before and after hydrogenation?**

A) Solid → Liquid

✔ **B) Liquid (unsaturated) → Solid (saturated)**

C) Liquid (saturated) → Solid (unsaturated)

D) Gas → Solid

✔ Answer: B) Liquid (unsaturated) → Solid (saturated)

★ Explanation

Vegetable oils are liquid because they contain unsaturated fatty acids. Adding hydrogen (hydrogenation) saturates them, making them solid at room temperature.

83 **Which of the following is NOT a function of dietary fiber?**

A) Keeps the bowel functioning properly.

B) Lowers cholesterol levels.

✔ **C) Provides the brain with immediate energy.**

D) Regulates blood pressure.

✔ Answer: C) Provides the brain with immediate energy.

★ Explanation

Dietary fiber is indigestible and does not provide energy. The brain needs *glucose* (a simple sugar), which comes from digesting starches and sugars, not from fiber.

84 Nucleic acids are synthesized from:

A) Fatty acids

✔ **B) Nucleotides**

C) Amino acids

D) Monosaccharides

✔ Answer: B) Nucleotides

★ Explanation

Just as amino acids are the building blocks of proteins, nucleotides are the building blocks (monomers) of nucleic acids.

85 **Which of the following vitamins is essential for blood clotting?**

A) Vitamin A

B) Vitamin C

C) Vitamin D

✔ **D) Vitamin K**

✔ Answer: D) Vitamin K

★ Explanation

While the table specifically highlights Vitamins A and D, the text lists Vitamin K as a fat-soluble vitamin. In biochemistry, Vitamin K is universally known as the vitamin responsible for synthesizing proteins required for blood clotting.

ALL 85 QUESTIONS COMPLETED



Well Done!

Chapter 13: Biochemistry

Revise regularly and keep practising.
Success is built one MCQ at a time!

More notes, MCQs & past papers at

www.scholareye.xyz

Scholar Eye • Learn. Practise. Succeed.