Multiple Choice Questions: Lipids and Phospholipids

1. Which of the following is a characteristic of lipids?

- A. Soluble in water
- B. Nonpolar and hydrophobic
- C. Composed of amino acids
- D. Always solid at room temperature
- E. Highly reactive with acids

2. Which molecule is the building block of fats?

- A. Amino acids
- B. Fatty acids
- C. Glucose
- D. Nucleotides
- E. Proteins

3. What type of bond connects glycerol and fatty acids in a triglyceride?

- A. Glycosidic bond
- B. Ester bond
- C. Hydrogen bond
- D. Peptide bond
- E. Ionic bond

4. What is the primary role of triglycerides in organisms?

- A. Structural support
- B. Long-term energy storage
- C. Enzyme catalysis
- D. Transport of oxygen
- E. DNA replication

5. Which of the following is a saturated fatty acid?

- A. Oleic acid
- B. Palmitic acid
- C. Linoleic acid
- D. Arachidonic acid
- E. Stearidonic acid

6. What distinguishes unsaturated fatty acids from saturated fatty acids?

- A. The presence of a hydroxyl group
- B. Double bonds in the carbon chain
- C. The presence of an amine group
- D. Their solubility in water
- E. Their higher melting point

7. Which lipid forms the bilayer of cellular membranes?

- A. Triglycerides
- B. Cholesterol
- C. Phospholipids
- D. Steroids
- E. Waxes

8. What is the hydrophilic part of a phospholipid?

- A. Fatty acid tails
- B. Glycerol backbone
- C. Phosphate group
- D. Cholesterol molecule
- E. Carbon chain

9. Which lipid acts as a precursor for steroid hormones?

- A. Triglycerides
- B. Cholesterol
- C. Waxes
- D. Phospholipids
- E. Lipoproteins

10. Which is a property of waxes?

- A. Soluble in water
- B. High melting point
- C. Energy storage
- D. Contains amino acids
- E. Forms DNA helices

11. What is the primary function of phospholipids in cells?

- A. Energy storage
- B. Enzyme activity
- C. Structural components of membranes
- D. Hormone signaling
- E. Oxygen transport

12. Which lipid type is amphipathic?

- A. Triglycerides
- B. Steroids
- C. Phospholipids
- D. Waxes
- E. Glycolipids

13. Which part of a phospholipid is hydrophobic?

- A. Phosphate group
- B. Fatty acid tails
- C. Glycerol molecule
- D. Hydroxyl group
- E. Carboxyl group

14. What term describes a molecule with both hydrophobic and hydrophilic regions?

- A. Polar molecule
- B. Nonpolar molecule
- C. Amphipathic molecule
- D. Hydrophilic molecule
- E. Hydrophobic molecule

15. Which of the following is a steroid?

- A. Glycogen
- B. Testosterone
- C. Starch
- D. Cellulose
- E. Myosin

16. What distinguishes lipids from carbohydrates?

- A. Lipids contain nitrogen
- B. Lipids are composed of nucleotides
- C. Lipids are hydrophobic
- D. Lipids are made of repeating monosaccharides
- E. Lipids are soluble in water

17. Which of the following is NOT a lipid?

- A. Cholesterol
- B. Starch
- C. Waxes
- D. Triglycerides
- E. Phospholipids

18. What molecule is the primary component of the lipid bilayer?

- A. Glycogen
- B. Starch
- C. Phospholipids
- D. ATP
- E. Protein

19. What is the effect of cholesterol in the plasma membrane?

- A. Increases fluidity at low temperatures
- B. Decreases stability
- C. Completely solidifies the membrane
- D. Decreases fluidity at high temperatures
- E. Promotes permeability to ions

20. What is a micelle?

- A. A lipid droplet in the cytoplasm
- B. A circular structure formed by phospholipids in water
- C. A single layer of cholesterol molecules
- D. A protein-lipid complex
- E. An organelle involved in lipid metabolism

21. What causes the fluidity of the phospholipid bilayer?

- A. Presence of double bonds in fatty acids
- B. Presence of cholesterol only
- C. Presence of proteins
- D. Hydrogen bonding between layers
- E. Absence of fatty acids

22. What kind of lipid is a component of myelin sheaths in neurons?

- A. Triglycerides
- B. Phospholipids
- C. Steroids
- D. Waxes
- E. Glycolipids

23. Which of these lipids is considered "essential" in the human diet?

- A. Palmitic acid
- B. Omega-3 fatty acids
- C. Cholesterol
- D. Lauric acid
- E. Glycerol

24. What happens to lipid membranes at high temperatures?

- A. They become more rigid
- B. They disintegrate completely
- C. They become more fluid
- D. They form crystals
- E. Their permeability decreases

25. Which lipid is used to waterproof surfaces in plants?

- A. Triglycerides
- B. Cholesterol
- C. Waxes
- D. Phospholipids
- E. Steroids

26. What is the role of lipoproteins in the body?

- A. Catalyzing enzyme reactions
- B. Transporting lipids in the bloodstream
- C. Storing energy
- D. Acting as antibodies
- E. Synthesizing DNA

27. Which type of lipid contributes to atherosclerosis?

- A. HDL cholesterol
- B. Unsaturated fatty acids
- C. LDL cholesterol
- D. Phospholipids
- E. Omega-3 fatty acids

28. What structural component is unique to phospholipids compared to triglycerides?

- A. Glycerol
- B. Fatty acids
- C. Phosphate group
- D. Ester bonds
- E. Carbon rings

29. Which is a function of steroids in the human body?

- A. Acting as enzymes
- B. Providing immediate energy
- C. Serving as hormones
- D. Storing genetic material
- E. Building muscle fibers

30. Which of the following lipids acts as an energy reserve?

- A. Phospholipids
- B. Waxes
- C. Triglycerides
- D. Steroids
- E. Cholesterol

31. Which property allows lipids to function as long-term energy storage molecules?

- A. Hydrophilicity
- B. High water content
- C. High energy density
- D. Low carbon content
- E. Ability to form covalent bonds

32. Which of these lipids is a precursor for bile salts?

- A. Triglycerides
- B. Cholesterol
- C. Waxes
- D. Phospholipids
- E. Steroids

33. How do phospholipids arrange themselves in a bilayer?

- A. Fatty acid tails facing outward, phosphate groups inward
- B. Phosphate groups facing outward, fatty acid tails inward
- C. All tails on one side, all heads on the other
- D. Heads form hydrogen bonds with each other
- E. Phosphates form ionic bonds with tails

34. Which of the following is an example of a polyunsaturated fatty acid?

- A. Palmitic acid
- B. Oleic acid
- C. Linoleic acid
- D. Stearic acid
- E. Arachidic acid

35. Which lipid is associated with the prevention of inflammation?

- A. Saturated fats
- B. Trans fats
- C. Omega-3 fatty acids
- D. Phospholipids
- E. Cholesterol

36. What happens when phospholipids are added to water?

- A. They dissolve completely
- B. They form micelles or bilayers
- C. They float as a monolayer
- D. They become gaseous
- E. They sink to the bottom

37. Which of the following lipids is used in energy storage?

- A. Phospholipids
- B. Cholesterol
- C. Triglycerides
- D. Waxes
- E. Steroids

38. What does the term "hydrophobic" mean?

- A. Attracted to water
- B. Repelled by water
- C. Soluble in water
- D. Neutral towards water
- E. Bonds with water

39. What determines the melting point of fatty acids?

- A. Chain length and degree of saturation
- B. Hydrogen bond formation
- C. Presence of ester bonds
- D. Glycerol content
- E. Presence of phosphate groups

40. Which lipids serve as insulation in animals?

- A. Steroids
- B. Triglycerides
- C. Phospholipids
- D. Waxes
- E. Glycolipids

41. What is the effect of trans fats on health?

- A. Increases HDL cholesterol levels
- B. Reduces LDL cholesterol levels
- C. Increases LDL cholesterol levels
- D. Prevents atherosclerosis
- E. Reduces triglycerides

42. What distinguishes HDL from LDL?

- A. HDL transports cholesterol to tissues, LDL removes it
- B. HDL contains more lipids than LDL
- C. HDL helps remove cholesterol from tissues, LDL deposits it
- D. HDL is hydrophobic, LDL is hydrophilic
- E. HDL is a triglyceride, LDL is a phospholipid

43. What happens to excess lipids in the body?

- A. They are excreted
- B. They are stored as glycogen
- C. They are stored as triglycerides in adipose tissue
- D. They are converted to proteins
- E. They are broken into amino acids

44. Which lipids play a role in cell signaling?

- A. Triglycerides
- B. Steroids
- C. Phospholipids
- D. Waxes
- E. Glycolipids

45. Which lipid is responsible for waterproofing bird feathers?

- A. Triglycerides
- B. Waxes
- C. Cholesterol
- D. Steroids
- E. Phospholipids

46. Which enzyme breaks down fats during digestion?

- A. Amylase
- B. Lipase
- C. Protease
- D. Sucrase
- E. Lactase

47. Which characteristic applies to saturated fats?

- A. Liquid at room temperature
- B. Contains double bonds
- C. Solid at room temperature
- D. Contains a phosphate group
- E. Essential fatty acid

48. Which lipid is part of the skin's barrier to prevent dehydration?

- A. Triglycerides
- B. Phospholipids
- C. Cholesterol
- D. Waxes
- E. Steroids

49. What is a characteristic of cis-unsaturated fatty acids?

- A. Linear structure
- B. Solid at room temperature
- C. Bent structure
- D. Completely hydrophobic

E. Non-essential

50. What is the main component of adipose tissue?

- A. Glycogen
- B. Phospholipids
- C. Triglycerides
- D. Waxes
- E. Cholesterol