

1. What is the prosthetic group of the vision protein rhodopsin?
 - a. retinol
 - b. retinal
 - c. retinoic acid
 - d. β -carotene

2. Another name for α -tocopherol is vitamin _____.
 - a. A
 - b. E
 - c. C
 - d. D

3. _____ are the simplest lipids but they may be a part of or a source of many complex lipids.
 - a. Triglycerols
 - b. Carbohydrates
 - c. Terpenes
 - d. Fatty acids

4. Fatty acids required in the diet of mammals are called:
 - a. important.
 - b. dietary.
 - c. saturated.
 - d. essential.

5. Triacylglycerols are **not** found in cell membranes because they are:
 - a. amphipathic.
 - b. not amphipathic.
 - c. not abundant in cells.
 - d. charged at biological pH.

6. The arrangement of lipid bilayers and other components is the basis for the currently widely accepted description which is called the:
 - a. fluid model.
 - b. lipid bilayer model.
 - c. mosaic model.
 - d. fluid mosaic model.

7. Facilitated diffusion (passive transport) through a biological membrane is
- generally irreversible.
 - driven by the ATP to ADP conversion.
 - driven by a concentration gradient.
 - endergonic.
8. Very large molecules (e.g.LDL) can be transported across membranes by _____.
- pores or channels with very large openings through the center
 - active transport proteins
 - diffusion down a concentration gradient
 - endocytosis
9. Vitamin D helps control the utilization of which ion?
- Mg^{2+}
 - Fe^{2+}
 - Ca^{2+}
 - Co^{2+}
10. Vitamin K is important in the _____.
- synthesis of collagen .
 - absorption of calcium ions.
 - coagulation of blood (clotting).
 - scavenging of oxygen and free radicals.
11. A fatty acid designated as 18:0 is -----, while one that is designated 18:1 is-----.
- simple; complex
 - complex; simple
 - saturated; unsaturated
 - unsaturated; saturated
12. Most lipids in the average human diet are:
- unsaturated fatty acids.
 - saturated fatty acids.
 - glycerophospholipids.
 - triacylglycerols.

13. Triacylglycerols cannot form lipid bilayers because they
- have hydrophobic tails.
 - do not have polar heads.
 - cannot associate with cholesterol.
 - have polar heads.
14. Which type of membrane protein might be dissociated from the membrane by changing the pH or the ionic strength?
- integral membrane protein
 - peripheral membrane protein
 - lipid-anchored membrane protein
 - membrane enzymes.
15. Which does not apply to the diffusion of oxygen, carbon dioxide and small hydrophobic molecules across a membrane?
- Diffusion is driven by the concentration gradient across the membrane.
 - The diffusion is spontaneous and there is a decrease in free energy as diffusion occurs.
 - The transport is saturatable.
 - Membrane proteins are not needed for the diffusion process.
16. Another name for facilitated diffusion is _____.
- active transport
 - transverse diffusion
 - lateral diffusion
 - passive transport
17. Which of the following increase the cell membrane fluidity?
- proteins
 - saturated fatty acids
 - free cholesterol
 - unsaturated fatty acids
18. All of the following compounds contain a phosphate group EXCEPT
- cerebroside
 - sphingomyelin
 - lecithin
 - cardiolipin

19. Which of the following statements is **CORRECT** about cholesterol?
- a. it is not found in animal cells
 - b. it is found in plant oils
 - c. it can be converted into vitamins D and E when the skin is exposed to the direct sunlight
 - d. it can be converted into progesterone
20. Which one of the following substances is the precursor of the other three?
- a. prostaglandin PGE1
 - b. thromboxane A2
 - c. arachidonic acid
 - d. leukotriene C
21. The asymmetry associated with biological membranes refers to the:
- a. degree of lateral mobility of integral membrane proteins.
 - b. ratio of phospholipid to cholesterol.
 - c. differences in lipid composition of the outer and inner membrane bilayer.
 - d. ratio of peripheral to integral membrane protein.
22. Which of the following substances contain a phosphorus atom?
- a. estradiol
 - b. progesterone
 - c. ganglioside GM1
 - d. sphingomyelin
23. All of the followings are found in both sides of the lipid bilayer membranes except:
- a. Sphingomyelin.
 - b. Cerebroside.
 - c. Ganglioside.
 - d. Cholesterol.
24. which of the following is a precursor of vitamin A
- a. beta carotene
 - b. cholesterol
 - c. coenzyme A
 - d. arachidonic acid

25. Which of the following is involved in secondary active transport process?
- a. galactoside permease
 - b. ATPase
 - c. ribonuclease
 - d. sphingomyelin
26. Phosphatidylcholine is an amphipathic molecule due to the presence of:
- a. choline, phosphate, and two fatty acids
 - b. glycerol and two fatty acids
 - c. glycerol
 - d. two fatty acids
27. Facilitated diffusion (passive transport) through a biological membrane is
- a. generally irreversible.
 - b. driven by the ATP to ADP conversion.
 - c. driven by a concentration gradient.
 - d. endergonic.
28. Polar molecules (e.g., glucose) can be transported through cell membrane by:
- a. pores or channels with very large openings through the center
 - b. active transport proteins
 - c. facilitated transport
 - d. cell receptors and endocytosis
29. Which of the following statements is TRUE?
- a. LDL-receptors cannot be recycled to the cell membrane
 - b. oversupply of cholesterol in the cell inhibits the synthesis of LDL-receptors
 - c. cholesterol enters the cells directly
 - d. LDL-receptor is a lipid

30. Which of the following statements is NOT TRUE?
- a. movement of potassium ions into the cell occurs in the direction of its concentration gradient
 - b. movement of potassium ions into the cell occurs against its concentration gradient
 - c. conformational change of the sodium-potassium pump protein is necessary for sodium ion movement outside the cell
31. Rigidity of the bilayer membrane
- a. increases with the increase in the unsaturation of the fatty acid chains of its phospholipids
 - b. decreases with the increase in the saturation of the fatty acid chains of its phospholipids
 - c. is higher in plant cells than animal cells
 - d. increases with increased cholesterol content
32. All the following compounds are polar lipids EXCEPT:
- a. lecithin
 - b. sphingomyelin
 - c. phosphatidic acid
 - d. cholesteryl ester
33. For the sodium and potassium transport process across the cell membrane
- a. it is a facilitated transport process
 - b. it is a simple diffusion process
 - c. the pump protein is an integral part of the cell membrane and undergoes phosphorylation
 - d. it keeps the concentration of sodium ions outside the cell lower than inside the cell
34. What are the membrane structures that function in active transport?
- a. peripheral proteins.
 - b. carbohydrates.
 - c. integral proteins.
 - d. hydrophobic molecules.

35. Which of the following statements is FALSE?
- a. LDL-receptors can be recycled to the cell membrane
 - b. oversupply of cholesterol in the cell inhibits the synthesis of LDL-receptors
 - c. cholesterol enters the cells directly
 - d. LDL-receptor is a protein
36. The CORRECT statement from the following is
- a. unsaturated fatty acids in the cell membrane decreases its packing
 - b. the lipid bilayer of the cell membrane is symmetric
 - c. saturated fatty acids in the cell membrane decreases its packing
 - d. the heads of phospholipid molecules in the cell membrane are stabilized by hydrophobic interaction
37. Phosphatidic acid is
- a. found in lecithin
 - b. esterified to one fatty acid and two phosphoric acid
 - c. esterified to three fatty acids and one phosphoric acid
 - d. is common in sphingolipids
38. The complex rodopsin that is formed in the eye retina results from the reaction between:
- a. retinol and opsin
 - b. 11-cis-retinal and opsin
 - c. 11-trans-retinal and opsin
 - d. retinal and vitamin A
39. Which of the following is an example of secondary active transport?
- a. sodium-potassium exchange
 - b. lactose uptake by bacteria
 - c. glucose uptake by red blood cells
 - d. movement of oxygen in the direction of concentration gradient
40. What is the prosthetic group of the vision protein rhodopsin?
- a. retinol
 - b. retinal
 - c. retinoic acid
 - d. beta-carotene

41. Which of the following substances is structurally different from the other three?
- estradiol
 - progesterone
 - testosterone
 - sphingomyelin
42. Which of the following has an antioxidant activity?
- vitamin K₁
 - alpha tocopherol
 - cholecalciferol
 - vitamin A
43. Which of the following statements is **NOT TRUE**?
- the metabolically active form of vitamin D is D₃
 - the metabolically active form of vitamin D is 1, 25-dihydroxycholecalciferol
 - retinal binds with opsin through the N-terminal lysine residue
 - beta-carotene is a precursor of vitamin A
44. Sodium-potassium ion pump protein is involved in
- primary active transport
 - secondary active transport
 - simple diffusion
 - facilitated transport
45. Which of the following statements is **NOT TRUE**?
- movement of sodium ions outside the cell occurs against its concentration gradient
 - movement of sodium ions outside the cell occurs in the direction of its concentration gradient
 - conformational change of the sodium-potassium pump protein is necessary for sodium ion movement outside the cell
 - ATP is required for sodium-potassium exchange
46. Which of the following statements is **TRUE**?
- the cell membrane is crowded with proteins
 - in the fluid-mosaic model, cell membrane proteins can not float in the lipids of the membrane
 - the cell membrane is composed of one layer of phospholipids
 - receptor proteins are found in the interior of the cell membrane

47. Which of the following statements is TRUE?
- a lipid bilayer becomes more ordered at high temperature
 - a lipid bilayer becomes disordered at low temperature
 - presence of cholesterol in the membrane increases its rigidity
 - presence of unsaturated fatty acids in the membrane increases its rigidity
48. The CORRECT statement from the following is
- unsaturated fatty acids in the cell membrane increases its packing
 - the lipid bilayer of the cell membrane is asymmetric
 - saturated fatty acids in the cell membrane decreases its packing
 - the heads of phospholipid molecules in the cell membrane are stabilized by hydrophobic interaction
49. All the following features describe lipids, except:
- Preponderance of non-polar groups.
 - Absence of ionic groups.
 - Presence of long hydrocarbon chains.
 - They have limited solubility in chloroform.
50. Cerebroside is composed of all of the following, except:
- Sphingosine
 - Fatty acid
 - Phosphate
 - Sugar.
51. Glycolipids are particularly important in these structures:
- Membranes.
 - Lipoproteins.
 - The brain and nervous system.
 - Membranes, the brain and the nervous system.
52. Membrane lipids in a lipid bilayer are held together by
- hydrophobic interactions
 - hydrogen bonds
 - electrostatic forces
 - covalent bonds

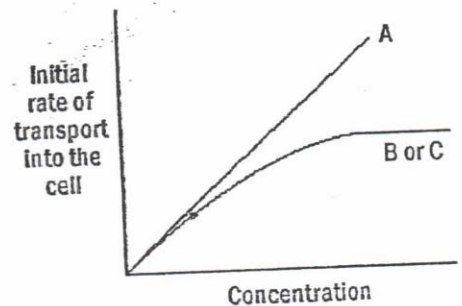
53. In the fluid mosaic model of membrane structure
- a. the proteins are specifically bonded to the lipids
 - b. the proteins "float" in the lipid bilayer
 - c. the proteins are sandwiched between the lipid molecules
 - d. the lipids are sandwiched between the protein molecules

54. Vitamin E has all of the following properties, **except**:
- a. It is an antioxidant.
 - b. It can be made in the sunshine.
 - c. It is a good reducing agent.
 - d. It is often a component of membranes.

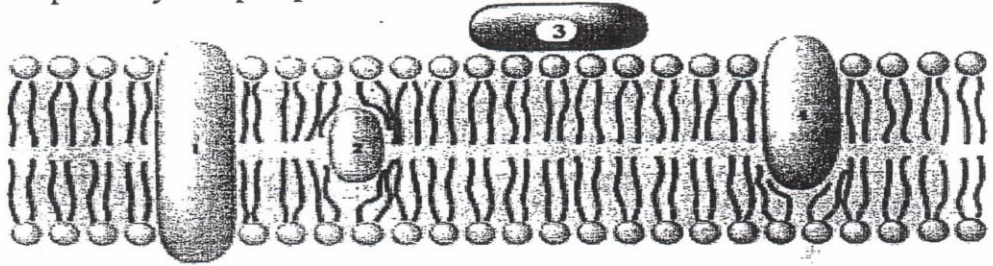
55. Aspirin produces most of its analgesic effects by
- a. binding to the plasma membrane of nerve cells
 - b. inhibiting the synthesis of vitamin A
 - c. inhibiting the synthesis of phospholipids
 - d. inhibiting the synthesis of prostaglandins

56. The graph shows the initial rate of transport for each substance, when the cells are placed in solutions of different concentrations of A, B, and C. Based on this data, **substance A** is transported via?

- a. Active transport
- b. Facilitated diffusion
- c. Passive diffusion
- d. Osmosis



57. Referring to the following figure. Which protein association with the lipid bilayer is peripheral?



- a. 1
- b. 2
- c. 3
- d. 4

58. Which of the following increase the cell membrane fluidity?

- a. proteins
- b. saturated fatty acids
- c. free cholesterol
- d. unsaturated fatty acids

59. Sodium-potassium ion pump is an example of:

- a. simple diffusion
- b. facilitated diffusion
- c. active transport
- d. passive transport

60. The non-polar interaction between unsaturated fatty acid molecules

- a. decreases with the increase in the cis-double bonds
- b. decreases with the increase in the trans-double bonds
- c. has no affect on the melting point of the fatty acid
- d. largely increases the polarity of the fatty acid

61. Which of the following statements is **CORRECT** about cholesterol?

- a. it is not found in animal cells
- b. it is found in plant oils
- c. it can be converted into vitamins D and E when the skin is exposed to the direct sunlight
- d. it can be converted into progesterone

62. All of the followings are true of the sodium/potassium ATPase (pump)

EXCEPT:

- a. it transports sodium from inside the cell to the outside
- b. it does not hydrolyze ATP
- c. it transports potassium from outside the cell to the inside
- d. it maintains the ionic concentration gradient

Question	Answer	Question	Answer	Question	Answer
1	B	22	D	43	A
2	B	23	C	44	A
3	D	24	A	45	A
4	D	25	A	46	A
5	B	26	A	47	C
6	D	27	C	48	B
7	C	28	C	49	D
8	D	29	B	50	C
9	C	30	A	51	D
10	C	31	D	52	A
11	C	32	D	53	B
12	D	33	C	54	B
13	B	34	C	55	D
14	B	35	C	56	C
15	C	36	A	57	C
16	D	37	A	58	D
17	D	38	B	59	C
18	A	39	B	60	A
19	D	40	B	61	D
20	C	41	D	62	B
21	C	42	B		