

DOCTOR
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FIRST BIOLOGY



Done by:
Faten ALDra'awi

Q1) Which of the following is not a type of junction in animal cells?

- A. Gap junction
- B. Desmosomes
- C. Plasmodesmata
- D. Tight junction
- E. None of the above

Q2) Cell membranes are made up of a mosaic of

- A. Phospholipids and proteins
- B. Cellulose and proteins
- C. Starch and proteins
- D. Nucleic acid and proteins
- E. Only phospholipids

Q3) Lipid soluble (hydrophobic) small molecules. CO₂ and O₂ enter the cell by

- A. Diffusion through channel protein
- B. Diffusion through the lipid bilayer
- C. Osmosis
- D. Active transport
- E. Bulk transport

Q4) The role of cholesterol on the membrane fluidity of animal cells is to:

- A. Restrain (limits) movement of phospholipids at high temperature
- B. Prevent tight packing of phospholipids at low temperature
- C. Restrains movement of proteins at low temperature
- D. Preventing tight packing of proteins at high temperature
- E. A and B

Q5) What mechanisms do plants use to transport sucrose produced by photosynthesis into specialized cells in leaves against its concentration gradient?

- A. Diffusion
- B. Sucrose puming
- C. Cotransport
- D. Receptor mediated endocytosis

E. Phagocytosis

Q6) The sodium-potassium pump

- A. Moves sodium ions into the cell and potassium ions out of the cell.
- B. Is an electrogenic pump
- C. Moves sodium and potassium ions into the cell.
- D. Moves sodium and potassium ions along their electrochemical gradients.
- E. All of the above

Q7) The process that molecules move into cells via vesicles is

- A. Co-transport
- B. Facilitated diffusion
- C. Endocytosis
- D. Secretion
- E. None of the above

Q8) Which of the following properties is shared by starch and cellulose?

- A. Digested by humans
- B. Polymers of glucose
- C. Structural carbohydrates
- D. Branched carbohydrates
- E. None of the above

Q9) You would expect a cell with an extensive Golgi apparatus to

- A. Move actively
- B. Perform photosynthesis
- C. Secrete a lot of material
- D. Store large amount of food
- E. Make a lot of ATP

Q10) Cell membranes are asymmetrical. Which of the following is a most likely explanation?

- A. The “innerness” and “outerness” of membrane surfaces are predetermined by bound ribosomes
- B. Proteins can only span cell membranes if they are hydrophobic.
- C. Cell membranes communicate signals from one organism to another.
- D. Cell membranes proteins are determined as the membrane is being packaged in the ER and Golgi.
- E. Cell membrane orientation is determined by free ribosomes.

Q11) What bond between water molecules make them stick together?

- A. Hydrogen bonds
- B. Covalent bonds
- C. Polar covalent bonds
- D. VanderWaals forces
- E. None of the above

Q12) Lakes and oceans, do not quickly fluctuate (change) in temperature.

What is the reason for this phenomenon?

- A. Water is an acid
- B. Water is a versatile solvent
- C. Water has a high specific heat
- D. Water acts as a buffer
- E. All of the above

Q13) Specific heat of water molecule contribute to the following, except

- A. Organisms resist changes in body temperature
- B. Ice floating on top of liquid water
- C. Stabilize ocean temperature
- D. Water heat of vaporization
- E. None of the above

Q14) How many molecules of water are needed to completely hydrolyze a 25 monomer long polypeptide

- A. 35
- B. 24
- C. 50
- D. 25
- E. Zero

Q15) Aldoses and ketoses differ in

- A. The position of the carbonyl group
- B. The position of the hydroxyl groups
- C. The number of carbon atoms
- D. The number of oxygen atoms
- E. The position of carbon atom

Q16) A saturated fatty acid contains more ——— atoms than unsaturated fatty acid

- A. Carbon
- B. Oxygen
- C. Nitrogen
- D. Phosphate
- E. Hydrogen

Q17) Which of the following molecules is a not a polysaccharide?

- A. Amylose
- B. Glycogen
- C. Cellulose
- D. Chitin
- E. Collagen

Q18) Which is false about proteins?

- A. Protein's specific structure determines how it works
- B. Functional protein is not just a polypeptide chain
- C. The bond linking amino acids is non covalent
- D. Polypeptide backbone is the same in all polypeptides
- E. The R group of amino acid monomers differs from one amino acid to another

Q19) Which level of protein organization is due to interactions between amino acid side chain groups?

- A. Primary
- B. Secondary
- C. Tertiary
- D. Quaternary

E. All of these

Q20) In a double -stranded DNA molecule, phosphodiester linkage consists of a phosphate group that links

- A. cytosine to guanine
- B. the sugars of two nucleotides
- C. thymine to adenine
- D. ribose to a nitrogenous base
- E. deoxyribose to a nitrogenous base

Q21) Which pair is mismatched?

- A. Amino acids polymer———— protein
- B. alpha Glucose polymer————glycogen
- C. B Glucose polymer————cellulose
- D. Purine———— thymine
- E. Fatty acid———— hydrophobic

Q22) A microscope that exposes specimens to ultraviolet and forms an image with the resulting light emitted at a different wavelength is called a———— microscope.

- A. Phase contrast
- B. Fluorescence
- C. Bright -field
- D. Scanning electron
- E. Transmission electron

Q23) In sucrose the linkage between glucose and fructose is a— — — — linkage

- A. 1-4 glycosidic
- B. 1-4 ester
- C. 1-6 glycosidic
- D. 1-2 ester
- E. 1-2 glycosidic

Q24) Which characteristic could be shared by the primary and tertiary structures of protein?

- A. Both could have hydrogen bonds between the repeating constituents of the polypeptide backbone
- B. Both have peptide bond between the amino acids
- C. Both are functional proteins
- D. Both could have disulfide bridge
- E. Both must contain glycerol molecule

Q25) Changing one amino acid in a protein could change

- A. its ability to function
- B. its shape
- C. its primary structure
- D. its tertiary structure
- E. all are correct

Q26) All types of nucleic acids

- A. are single-stranded molecules
- B. are polymers
- C. have hexose sugar
- D. have deoxy-ribose
- E. contain the same nitrogenous bases

Q27) A double-stranded DNA molecule contains 20 purines and 20 pyrimidines should be composed of

- A. 20 adenine and 20 thymine
- B. 20 thymine and 20 uracil
- C. 40 cytosine
- D. 40 cytosine and 40 guanine
- E. 20 adenine and 20 guanine

Q28) Which microscope is usually good for use on living unstained cells?

- A. Phase contrast
- B. Fluorescence
- C. Bright-field
- D. Scanning electron
- E. Transmission electron

Q29) Which of the following structures is NOT present in a prokaryote cell?

- A. Mitochondria
- B. DNA
- C. Cytoplasm
- D. Ribosomes
- E. plasma membrane

Q30) Which of the following is NOT true for the nuclear envelope?

- A. It is exactly like other cellular membranes
- B. The nuclear envelope separates the genetic material from the cytoplasm
- C. It is a pair of membranes
- D. It is porous (perforated)
- E. It has bound ribosomes

Q31) Which of the following organelle is linked to Tay-Sachs disease?

- A. Golgi apparatus
- B. Chloroplast
- C. Mitochondria
- D. Lysosome
- E. Rough endoplasmic reticulum

Q32) The ————acts as protein packaging and processing center in the cell?

- A. Smooth Endoplasmic reticulum
- B. Peroxisomes
- C. Golgi apparatus
- D. Nucleus
- E. Nucleolus

Q33) In muscle cells——— is responsible for the storage and release of calcium ions

- A. smooth Endoplasmic reticulum
- B. rough Endoplasmic reticulum
- C. Golgi apparatus
- D. contractile vacuole
- E. ECM

Q34) Which of the following contains enzymes that transfer hydrogen from various substrates to oxygen?

- A. lysosome
- B. vacuole
- C. mitochondrion
- D. Golgi apparatus
- E. peroxisome

Q35) Which of the following is present in a prokaryotic cell?

- A. mitochondrion
- B. ribosome
- C. nuclear envelope
- D. chloroplast
- E. ER

Q36) Which cytoskeletal element is involved in cytoplasmic streaming?

- A. Intermediate filaments
- B. Microfilaments
- C. Microtubules
- D. Motor proteins
- E. All choices are correct

Q37) Signals between the ECM and the cytoskeleton may be transmitted by

- A. fibronectin .
- B. proteoglycans.
- C. integrins.
- D. collagen.
- E. middle lamella.

Q38) Thylakoids, DNA, and ribosomes are all components found in

- A. vacuoles
- B. stroma
- C. mitochondria
- D. lysosomes
- E. nuclei.

Q39) Osmosis refers to

- A. the movement of water molecules across a selectively permeable membrane
- B. the diffusion of hydrophobic molecules across a selectively permeable membrane
- C. the diffusion of any material across a selectively permeable membrane
- D. a type of active transport
- E. the movement of water molecules across the cell wall of plant cells

Q40) Which of the following is true for H⁺/ sucrose cotransporter?

- A. Works as a channel for the passage of sucrose and H⁺ across the cell membrane
- B. Transports sucrose down its concentration gradient.
- C. Transports H⁺ against its electrochemical gradient.
- D. Transports sucrose against its concentration gradient and H⁺ along its electrochemical gradient.
- E. None of the above

Q41) Which of the following could generate voltage across cell membrane?

- A. Na⁺/K⁺ pumps
- B. H⁺/Sucrose cotransporter
- C. H⁺ pumps
- D. Aquaporins
- E. A and C

Q42) The sodium-potassium pump moves

- A. sodium ions out of the cell and potassium ions into the cell against their electrochemical gradients.
- B. sodium ions into the cell and potassium ions out of the cell against their electrochemical gradients.
- C. sodium and potassium ions into the cell along their electrochemical gradients.
- D. sodium and potassium ions out of the cell against their electrochemical gradients.
- E. none of the above

Q43) The process that releases substances from the cell via vesicles is

- A. passive transport
- B. facilitated diffusion
- C. endocytosis

D. exocytosis

E. receptor mediated endocytosis

Q44) Which type of organelle is found in plant cells but NOT in animal cells?

A. Ribosomes

B. Mitochondria

C. Nuclei

D. Glyoxysomes

E. None of these

Q45) Motor proteins interact with what structures to achieve organelle movement in cells?

A. Plasmodesmata

B. Integrins

C. Ribosomes

D. Microtubules

E. Fibronectins

Q46) Which cytoskeletal elements are responsible for the formation of pseudopodia?

A. Intermediate filaments

B. Microfilaments

- C. Microtubules
- D. Motor proteins
- E. All choices are correct

Q47) Ions can travel directly from the cytoplasm of one animal cell to the cytoplasm of an adjacent cell through

- A. Plasmodesmata
- B. Intermediate filaments
- C. Tight junctions
- D. Desmosomes
- E. gap junctions

Q48) Animal cells adhere together strongly through ——— which are supported by intermediate filaments

- A. Plasmodesmata
- B. Cellulose fibers
- C. Tight junction
- D. Desmosomes
- E. gap junctions

Q49) Which of the following is amphipathic?

- A. Phospholipids

- B. Cholesterol
- C. Cellulose
- D. Collagen
- E. Glycogen

Q50) Which of the following statements is correct about aquaporins?

- A. Are membrane carrier protein
- B. Composed only of non-polar amino acids
- C. Facilitated the passage of hydrophobic molecules across cell membrane
- D. Are mainly found in the cytosol
- E. Facilitated the passage of water molecules across cell membrane

Q51) In water molecule, the atom in which electrons spend more time will have a ———— charge, and the atom around which the electrons spend the least time will have ———— charge.

- A. slightly negative, slightly positive
- B. only positive charge
- C. only negative charge
- D. neutral charge
- E. None of the above

Q52) The high heat capacity (specific heat) of water allows it to:

- A. form additional hydrogen bonds
- B. absorb large amounts of heat energy before the temperature changes
- C. boil at higher temperatures than many liquids
- D. B and C
- E. None of the above

Q53) Oil does not dissolve in water because

- A. Oil is a liquid
- B. Oil is more dense than water
- C. Oil molecules are non-polar
- D. Oil is hydrophilic
- E. None of the above

Q54) Which of the following is not a polymer?

- A. Steroid
- B. Starch
- C. Cellulose
- D. Chitin
- E. DNA

Q55) Cellulose

- A. is a polymer of sucrose subunits

- B. is a storage polysaccharide of plants
- C. Is a storage polysaccharide of animals
- D. Is a major structural component of plant cell walls.
- E. is a major structural component of cell membrane

Q56) A phospholipid molecule has

- A. hydrophobic tail
- B. hydrophilic head
- C. three fatty acids
- D. phosphate group
- E. all except C

Q57) The term "Microfibril" is most related to

- A. polypeptides
- B. Cellulose
- C. starch
- D. amylose
- E. amylopectin

Q58) Which of the following is concerned with the synthesis of phospholipids and steroids in the cell?

- A. Rough Endoplasmic reticulum

- B. Smooth Endoplasmic reticulum
- C. Golgi apparatus
- D. Lysosome
- E. Plasma membrane

Q59) Nucleolus is concerned with:

- A. producing mRNA
- B. large and small ribosome subunit assembly
- C. lysosome production
- D. chromosome duplication
- E. synthesis of tRNA

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