Difficult Multiple Choice

(See related pages)

1 The plasma membrane is effective in isolating the cytoplasm from the extracellular fluid primarily because

- ○ **A)** peripheral proteins are attached to the inner or outer membrane surface
- ○ **B)** integral proteins form channels that let water pass in and out of the cell
- ○ **C)** the lipid "tails" in the phospholipid bilayer form a sheet that repels water
- ○ **D)** the rigid composition of the plasma membrane forms a waterproof barrier

2 Of all the passive processes, the only one that does *not* require a concentration gradient is

- ○ **A)** diffusion
- ○ **B)** osmosis
- ○ **C)** bulk filtration
- ○ **D)** facilitated diffusion

3 A transport or carrier protein

- ○ **A)** spans the plasma membrane completely and is thus a transmembrane protein
- ○ **B)** has an internal hydrophobic region and hydrophilic regions at both ends
- ○ **C)** may use energy from ATP to help a particular substance cross the plasmalemma

○ **D)** all of the above

4 What *must* happen when a concentration gradient is eliminated?

○ **A)** molecular motion ceases

○ **B)** active transport begins

○ **C)** diffusion and osmosis stop

○ **D)** all of the above

5 Which one of the following processes can only occur in a living cell?

○ **A)** diffusion

○ **B)** osmosis

○ **C)** bulk filtration

○ **D)** endocytosis

6 All of the following are directly associated, at least in part, with the lipid components of the plasma membrane *except*

○ **A)** molecular bilayer framework

○ **B)** cholesterol molecules

○ **C)** catalytic enzymes

○ **D)** glycocalyx

7 A higher concentration of sodium ions in extracellular fluid versus cytosol is most likely maintained by

○ **A)** blocking any passage of sodium through the plasma membrane

○ **B)** actively transporting sodium ions out of the cell

○ **C)** overcrowding the cytosol with potassium ions

○ **D)** none of the above

8 Which of the following lists *only* non-membrane-bound organelles?

- **A)** microvilli, ribosomes, centrioles, mitochondria, cytoskeleton
- **B)** cytoskeleton, microvilli, centrioles, cilia, flagellum, ribosomes
- **C)** microvilli, cytoskeleton, cilia, lysosomes, nucleus, ribosomes
- **D)** cytoskeleton, endoplasmic reticulum, centrioles, nucleus, cilia, ribosomes

9 Which of the following lists *only* membrane-bound organelles?

- **A)** microtubules, nucleus, lysosomes, ribosomes, mitochondria, cilia
- **B)** lysosomes, ribosomes, peroxisomes, endoplasmic reticulum, Golgi apparatus
- **C)** endoplasmic reticulum, Golgi apparatus, mitochondria, lysosomes, peroxisomes
- **D)** mitochondria, cilia, centrioles, Golgi apparatus, endoplasmic reticulum, nucleus

10 Which one of the following organelles occurs in the *fewest* types of human cells?

- **A)** nucleus
- **B)** microtubule
- **C)** flagellum
- **D)** rough ER

11 Which of the following organelles are found in *all* living cells of the human body?

- **A)** nuclei
- **B)** nucleoli
- **C)** microvilli
- **D)** microtubule

12 The nucleus (and more specifically, the genes it contains) most directly controls all of

the cell's activities by

- **A)** controlling cell division
- **B)** regulating protein synthesis
- **C)** synthesizing DNA and RNA
- **D)** coordinating intracellular communication

13 Of the following, which organelle participates most directly in mitosis?

- **A)** smooth endoplasmic reticulum
- **B)** ribosome
- **C)** centriole
- **D)** nucleolus

14 Which series progresses from the thinnest to the thickest in diameter?

- **A)** DNA > histone > chromosome > nucleosome
- **B)** histone > chromosome > DNA > nucleosome
- **C)** nucleosome > histone > DNA > chromosome
- **D)** DNA > histone > nucleosome > chromosome

15 Although often described as somatic cell division, _____ is actually division of the nucleus.

- **A)** meiosis
- **B)** mitosis
- **C)** cytokinesis
- **D)** interphase

16 Mitosis plays a role in all of the following processes *except*

- **A)** tissue growth and repair
- **B)** replacement of old or dying cells
- **C)** sex cell production
- **D)** embryo formation

17 In an adult, which of the following usually have the longest G_0 phase?

- **A)** blood cells
- **B)** nerve cells
- **C)** epithelial skin cells
- **D)** the G_0 phase is the same length in all of these

18 The longest part of a mature muscle cell's life cycle is

- **A)** the G_2 phase
- **B)** the S phase
- **C)** interphase
- **D)** mitosis

19 During which stages of mitosis does a typical cell contain twice its normal number of chromosomes? (1) prophase (2) metaphase (3) anaphase (4) telophase

- **A)** 1 and 2
- **B)** 2 and 3
- **C)** 3 and 4
- **D)** all of the above

20 Which of the following organelles might function during or even after apoptosis of the cell that contains them?

- **A)** centrioles

○ **B)** Golgi apparatus

○ **C)** rough endoplasmic reticulum

○ **D)** lysosomes

21 Which property of cancer cells most directly contributes to metastasis?

○ **A)** invasiveness

○ **B)** dedifferentiation

○ **C)** production of angiogenesis factors

○ **D)** loss of contact inhibition

22 _____ is caused by a genetic defect in mitochondrial rather than nuclear DNA.

○ **A)** cystic fibrosis

○ **B)** MELAS syndrome

○ **C)** adrenoleukodystrophy

○ **D)** Tay-Sachs disease

23 If organelles can proliferate in response to increased demand, then one could expect to find far more _____ in the liver cells of an alcoholic than in a nondrinker.

○ **A)** rough ER

○ **B)** smooth ER

○ **C)** mitochondria

○ **D)** lysosomes

24 Which of the following cellular changes would generally be indicative of cancer?

○ **A)** anaplasia

○ **B)** hyperplasia

○ **C)** hypertrophy

○ **D)** all of the above

25 To destroy bacteria in the interstitial fluid, leukocytes would most likely employ the process of

○ **A)** receptor-mediated endocytosis

○ **B)** pinocytosis

○ **C)** bulk filtration

○ **D)** phagocytosis

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