

1. The term HOMEOSTASIS was coined by:
 - A. **W B Cannon**
 - B. Claude Bernard
 - C. Charles Sherrington
 - D. William Harvey

2. Transcellular fluid:
 - A. Is relatively large (8% of body weight)
 - B. Is that part of ECF that surrounds all cells
 - C. **It represents – digestive secretions, sweat, CSF**
 - D. Constitutes lymph

3. Which of the following is an example of positive feedback regulation system?
 - A. Secretion of Thyroxine by TSH
 - B. **Hodgkin's cycle of Na⁺ channel activation in nerve action potential**
 - C. Secretion of insulin by blood glucose
 - D. Regulation of Blood Pressure by Baroreceptors

4. Of the following substances, the lipid bilayer is most permeable to:
 - A. Sodium
 - B. Urea
 - C. Glucose
 - D. **Water**

5. Extracellular fluid in adults differs from intracellular fluid in that its:
 - A. Volume is greater.
 - B. Tonicity is lower.
 - C. **Anions are mainly inorganic.**
 - D. pH is lower

6. Glucose is Co-transported into the cell with:
 - A. **Sodium**
 - B. Potassium
 - C. Calcium
 - D. Hydrogen

7. Effectiveness of a control system is assessed by-
 - A. Loss
 - B. **Gain**
 - C. Improvement in function
 - D. Recovery

8. Which of the following statements regarding Mitochondria is FALSE:
 - A. Have membranes similar to the cell membrane.
 - B. **Are the chief site for protein synthesis.**
 - C. Are the chief sites for generation of ATP.
 - D. Are more numerous in brown than in white fat cells.

9. The major constituents of cell membrane is:

- A. Phospholipids
- B. Protein**
- C. Carbohydrate
- D. Cholesterol

10. Which of the following is not a cell adhesion molecule:

- A. Selectin
- B. Integrin
- C. Spectrin**
- D. Cadherin

11. Transport of nutrient substances across the cell membrane occurs via:

- A. Porins
- B. Ionophore
- C. Lipopolysaccharides
- D. Diffusion**

12. Most accurate measurement of ECF volume can be done by using:

- A. Sucrose
- B. Mannitol
- C. Inulin**
- D. Aminopyrine

13. RMP is mainly due to the permeability of membrane to:

- A. Sodium
- B. Potassium**
- C. Chloride
- D. Magnesium

14. Compared with intracellular fluid, the extracellular fluid has ____ sodium ion concentration, ____ potassium ion concentration, ____ chloride ion concentration, and ____ phosphate ion concentration.

- A. Lower, lower, lower, lower
- B. Lower, higher, lower, lower
- C. Lower, higher, higher, lower
- D. Higher, lower, higher, lower**

15. Gap junctions are present plentifully in-

- A. Cardiac muscle**
- B. Brain
- C. Kidney
- D. Skeletal Muscle

16. Assume that excess blood is transfused into a patient whose arterial baroreceptors are nonfunctional and whose blood pressure increases from 100 to 150 mm Hg. Then, assume that the same volume of blood is infused into the same patient under conditions in which his arterial baroreceptors are functioning normally and blood pressure increases from 100 to 125 mm Hg. What is the approximate feedback "gain" of the arterial baroreceptors in this patient when they are functioning normally?

- A. -1.0**
- B. -2.0
- C. 0.0
- D. +1.0

17. Which statement is incorrect?
- A. The term "homeostasis" describes the maintenance of nearly constant conditions in the body
 - B. In most diseases, homeostatic mechanisms are no longer operating in the body**
 - C. Body's compensatory mechanisms often lead to deviations from normal range in some of the body's functions
 - D. Disease is generally considered to be a state of disrupted homeostasis
18. Which of the following cell organelles is responsible for producing adenosine triphosphate (ATP), the energy currency of the cell?
- A. Mitochondria**
 - B. Lysosomes
 - C. Golgi apparatus
 - D. Ribosomes
19. Incorrect about feedback control systems-
- A. Most control systems of the body act by negative feedback
 - B. Positive feedback usually promotes stability in a system**
 - C. Generation of nerve actions potentials involves positive feedback
 - D. Feed-forward control is important in regulating muscle activity
20. The concept of 'Milieu Interior' was introduced by which of the following scientists?
- A. Finsen NR
 - B. W B Cannon
 - C. Claude Bernard**
 - D. William Harvey
21. Which of the following structures has been discovered as 80th organ of the body?
- A. Omentum
 - B. Interstitium**
 - C. Skin
 - D. Vermiform appendix
22. Catabolism of H₂O₂ is carried out by-
- A. Lysosome
 - B. Mitochondria
 - C. Peroxisome**
 - D. Endoplasmic reticulum
23. In dividing cells, the spindle is formed by:
- A. Laminin
 - B. Keratin
 - C. Ubiquitin
 - D. Tubulin**
24. According to Fick's law of diffusion, the diffusion rate depends on all EXCEPT-
- A. Concentration gradient
 - B. Temperature**
 - C. Thickness of the membrane
 - D. Surface area of the membrane
25. Second messengers-
- A. Are substances that interact with first messenger outside the cells
 - B. Are substances that bind to first messengers in the cell membrane
 - C. Mediate the intracellular responses to many different hormones and neurotransmitters.**
 - D. Are not formed in the brain

26. For sodium-potassium pump, the coupling ratio is-
- A. 1:1
 - B. 3:2**
 - C. 2:1
 - D. 2:3
27. Cell volume and shape are maintained by-
- A. Goldmann effect
 - B. Gibbs- Donnan Effect**
 - C. Singer – Nicolson effect
 - D. Fick effect
28. Which of the following increases the diffusion of substances across the cell membrane?
- A. Increased size of the particle
 - B. Increased lipid solubility of the substance**
 - C. Decreased lipid solubility of the substance
 - D. Thickness of the membrane
29. Active transport across the cell membrane is mediated by-
- A. G - proteins
 - B. Sodium – potassium pump**
 - C. Carrier proteins
 - D. Channel proteins
30. Binding site on beta subunit of sodium – potassium pump is for –
- A. Sodium
 - B. Potassium
 - C. ATP
 - D. Glycosylation**
31. Endocytosis-
- A. Includes phagocytosis and pinocytosis, but not clathrin-mediated or caveolae-dependent uptake of extracellular contents.
 - B. Refers to the merging of an intracellular vesicle with the plasma membrane to deliver intracellular contents to the extracellular milieu.
 - C. Refers to the invagination of plasma membrane to uptake extracellular contents into the cell.**
 - D. Refers to the vesicular trafficking between Golgi stacks.
32. Gap junctions are intercellular connections that-
- A. Primarily serve to keep cells separated and allow for transport across a tissue barrier.
 - B. Serve as regulated cytoplasmic bridge for sharing of small molecules between cells.**
 - C. Serve as a barrier to prevent protein movement within the cell membrane.
 - D. Are cellular components for constitutive exocytosis that occurs between adjacent cells.
33. A patient with a family history of peripheral neuropathy is found to have a decrease in nerve conduction velocity and an X-linked mutation of connexin, consistent with Charcot-Marie-Tooth Disease. Connexin is an important component of which of the following?
- A. Gap junction
 - B. Sarcoplasmic reticulum
 - C. Microtubule
 - D. Synaptic vesicle**

34. Which of the following is the approximate extracellular fluid volume of a normal individual?
- A. 5% of body mass
 - B. 60% of body mass
 - C. 20% of body mass
 - D. 40% of body mass
35. Resting membrane potential of neuron is equal to equilibrium potential of:
- A. Sodium
 - B. Potassium
 - C. Chloride
 - D. Bicarbonate
36. Equilibrium potential of an ion is calculated by-
- A. Gibbs-Donnan equilibrium
 - B. Nernst equation
 - C. Goldman equation
 - D. Katz equation
37. Which of the following cell do not show process of regeneration in adult life?
- A. Epithelial cells
 - B. Osteocytes
 - C. Endothelial cells
 - D. Neurons
38. Milieu interior is constituted by-
- A. Interstitial fluid
 - B. Intracellular fluid
 - C. Blood
 - D. Plasma
39. Resting nerve membrane is more permeable to K^+ than Na^+ by:
- A. 1 – 5 times
 - B. 20 – 50 times
 - C. 50 – 100 times
 - D. 200 – 500 times
40. Fluid in each body compartment is electrically neutral because:
- A. Ions constitute approximately 95% of the solutes in body fluids.
 - B. Sodium and chloride are largely extracellular, whereas potassium and phosphate are predominantly intracellular.
 - C. Essentially all of the body sodium and potassium is in the exchange pool.
 - D. Sum of the concentration of cations equals the sum of concentration of anions in each respective compartment.