

Multiple Choice Questions

1. The cell was first described by:

- A. Brown
- B. Schleiden
- C. Hooke**
- D. Virchow

2. Chloroplasts function in:

- A. cell division
- B. mitosis
- C. photosynthesis**
- D. respiration

3. A major chemical component of primary cell walls is:

- A. protein
- B. starch
- C. cellulose**
- D. lipids

4. Each half of a doubled chromosome can be called a:

- A. chromatid**
- B. centromere
- C. gene
- D. locus

5. Chromosomes are first visible in a dividing cell during:

- A. anaphase
- B. metaphase
- C. telophase
- D.** prophase

6. During mitosis the actual separation of chromatids takes place during:

- A. metaphase
- B. prophase
- C.** anaphase
- D. telophase

7. Diffusion ONLY occurs:

- A. provided there is a liquid solution
- B. in living cells
- C.** in the presence of a concentration difference
- D. across a selectively permeable membrane

8. During telophase, the:

- A. chromosomes migrate
- B.** phragmoplast develops
- C. nuclear membrane breaks down
- D. spindle appears

9. Yellow flower petals are likely to contain which organelle?

- A.** chromoplasts
- B. leucoplasts
- C. amyloplasts
- D. chloroplasts

10. The control center that houses the genetic material of a eukaryotic cell is the:

- A. ER
- B. cell membrane
- C. amyloplasts
- D.** nucleus
- E. nucleolus

11. The organelle which is the site of respiration is the:

- A. chlorophyll
- B. chloroplast
- C. vacuole
- D.** mitochondrion

12. The organelle which modifies and packages proteins made by the ER is the:

- A. ribosome
- B. leucoplast
- C. vacuole
- D.** Golgi apparatus

13. The rigid boundary of a plant cell which supports and protects the protoplast is called the:

- A.** cell wall
- B. middle lamella
- C. cell membrane
- D. plasmodesmata

14. The genetic blueprint within cells is:

- A.** DNA
- B. RNA
- C. proteins
- D. ATP

15. If a cell with 12 chromosomes undergoes mitosis, how many daughter cells result and what is the chromosome number in each daughter cell?

- A. 2 cells, 6 chromosomes each
- B. 4 cells, 6 chromosomes each
- C. 2 cells, 12 chromosomes each**
- D. 4 cells, 12 chromosomes each

16. A cell which is not dividing is said to be in which stage?

- A. anaphase
- B. interphase**
- C. metaphase
- D. prophase

17. An organelle common in plant cells but not found in animal cells is the:

- A. ribosome
- B. large central vacuole**
- C. nucleus
- D. plasma membrane

18. The correct order of stages in mitosis is:

- A. prophase, metaphase, anaphase, telophase**
- B. metaphase, prophase, anaphase, telophase
- C. prophase, anaphase, telophase, metaphase
- D. anaphase, metaphase, prophase, telophase

19. It is difficult to observe individual chromosomes during interphase because:

- A. the DNA has not been doubled yet
- B. they uncoil to form long, thin strands**
- C. they leave the nucleus and are dispersed to other parts of the cell
- D. chromatids do not pair up until division starts

20. Mitosis results in:

- A.** identical cells
- B. cells with half the normal number of chromosomes
- C. four cells
- D. spores

21. Chromosomes line up at the equator of the cell during what stage of mitosis?

- A. telophase
- B.** metaphase
- C. anaphase
- D. prophase

22. Cytokinesis occurs during what stage of mitosis?

- A. prophase
- B.** telophase
- C. anaphase
- D. metaphase

23. The material which makes up the middle lamella and turns fruit juice into jelly is:

- A. cutin
- B.** pectin
- C. suberin
- D. lignin

24. An organelle found in all green plant cells is the:

- A.** chloroplast
- B. chromoplast
- C. leucoplast
- D. microbody

25. Cytoplasmic connections between adjacent plant cells are known as:

- A. microtubules
- B. endoplasmic reticulum
- C. plasmodesmata**
- D. pits

26. Chromatin condenses into chromosomes and the nucleus and nucleolus disappear during which stage of mitosis?

- A. telophase
- B. metaphase
- C. anaphase
- D. prophase**

27. Leucoplasts commonly store:

- A. chlorophyll
- B. water
- C. pigments
- D. starch**

28. A biochemist measured the amount of DNA in cells growing in the laboratory and found that the quantity of DNA in a cell doubled:

- A. between prophase and anaphase
- B. between anaphase and telophase
- C. during metaphase
- D. between G₁ and G₂ phases of interphase**

29. Which of the following phases of mitosis is essentially the opposite of prophase in terms of nuclear changes?

- A. telophase**
- B. metaphase
- C. anaphase
- D. S phase

30. Which of the following organelles is associated with protein synthesis?

- A. rough ER
- B. ribosomes
- C. nucleolus
- D. all of the above**

31. What cellular structure has been described as "protein icebergs in a sea of lipids?"

- A. primary cell wall
- B. plasma membrane**
- C. smooth ER
- D. cytoskeleton

32. The inner membrane of the mitochondrion has numerous infoldings called:

- A. cristae**
- B. grana
- C. stroma
- D. endoplasmic reticulum

33. Which of the following cell structures is correctly matched with its function?

- A. endoplasmic reticulum; waste disposal
- B. nucleolus; ribosome synthesis**
- C. mitochondrion; transport
- D. leucoplast; pigment storage

34. Which of the following cell structures is mismatched with its function?

- A. chloroplast; photosynthesis
- B. ribosome; secretion**
- C. chromoplast; pigments
- D. cell wall; support

35. Mitochondria:

- A. are green because of the chlorophyll they contain
- B.** are the sites of cellular respiration
- C. have an inner membrane folded into stacks called grana
- D. are an RNA-rich region in the nucleus

True / False Questions

36. If a plant cell is placed in a hypertonic solution, so much water enters the protoplast that it becomes turgid.

FALSE

37. Active transport of substances into a cell always requires the expenditure of energy.

TRUE

38. The quantity of water entering a cell in an isotonic solution is equal to the amount of water exiting.

TRUE

39. The cells of a wilted plant have lost so much water that they become plasmolyzed.

TRUE

40. The Endosymbiont Theory postulates that some organelles in cells were once independent organisms.

TRUE

41. If vincristine, a drug that disrupts microtubules, is applied to dividing cells, chromosomes will not form.

FALSE

42. According to the Cell Theory, DNA is the genetic material in all cells.

FALSE

43. The cell is the basic unit of life.

TRUE