

Other review questions are provided at the end of the text chapters. There are a few questions at the end here over material we have not covered (46, 47, 48, 49). Don't worry about those.

1. Which of the following is not found in a prokaryotic cell?

- a. DNA
- b. Cell wall
- c. Plasma membrane
- d. Ribosomes
- e. Endoplasmic reticulum

2. All but one of the following are found in both plant and animal cells. Which one is not?

- a. Mitochondria
- b. Nucleus
- c. Chloroplasts
- d. Ribosomes
- e. Endoplasmic reticulum

3. Which of the following is a component of cilia and flagella?

- a. Cell wall
- b. Microtubules
- c. Microfilaments
- d. Intermediate filaments
- e. Actin fibers

4. For any 3-d shape of length L:

- a. Surface area is equal to L^2
- b. Surface area is proportional to L^3
- c. Volume is proportional to L^3
- d. Volume is equal to L^2

5. As a cell or other object gets smaller, its surface area/volume ratio:

- a. gets larger.
- b. gets smaller.

6. The difference in size between you and your cells, in an absolute sense, is about:

- a. 2 micrometers
- b. 2 millimeters
- c. 2 centimeters
- d. 2 meters

7. The difference in size between you and your cells, in a relative sense, is roughly the same as the difference between you and: (don't get hung up on being exact here- just consider "orders of magnitude")

- a. Earth (1.3×10^7 m) (12,742 km)
- b. North America (5×10^6 m) (5000 km)
- c. Missouri (4.5×10^5 m) (450 km)
- d. Springfield (1.3×10^4 m) (13 km)

8. Which type of microscopy would be most useful for observing the surface features of a preserved cell?

- a. Bright-field light
- b. Phase contrast light
- c. Confocal light
- d. Transmission electron
- e. Scanning electron

The next five questions refer to the list below. Match the function with the appropriate structure. Answers may be used more than once.

- a. ribosome
- b. mitochondrion
- c. cell membrane
- d. endoplasmic reticulum
- e. microtubules

9. catalyzes protein synthesis.

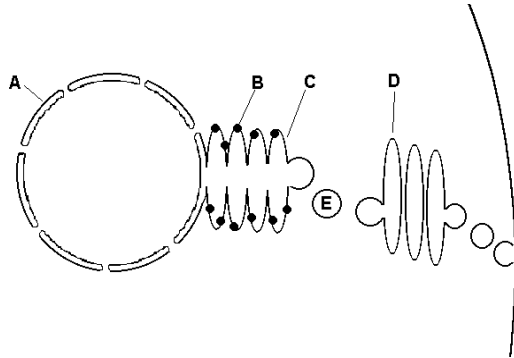
10. site of endocytosis.

11. continuous with nuclear membrane.

12. Which is evidence for an endosymbiotic origin of mitochondria?

- a. chemiosmosis
- b. electron transport
- c. mitochondrial DNA
- d. ATP synthase
- e. Kreb's cycle

The next five questions are based on the diagram below. Choose the letter indicating the appropriate structure from the diagram. Answers may be used more than once.



- 13. endoplasmic reticulum
- 14. nuclear envelope
- 15. Golgi apparatus
- 16. Ribosome

17. Energy use by cells results largely from active transport of:

- a. Mg^{++} in and Cl^- out
- b. Cl^- in and Mg^{++} out
- c. Na^+ out and Cl^- in
- d. Na^+ out and K^+ in

18. If a red blood cell is placed in a hypertonic solution, the cell will:

- a. shrink.
- b. swell and burst.
- c. swell until restrained by the cell wall.
- d. not change in volume.

19. Water moves toward:

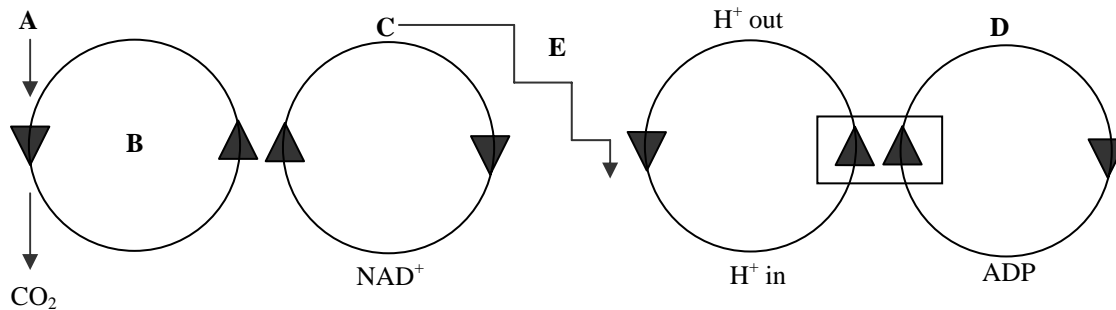
- a. higher solute concentration
- b. lower water concentration
- c. lower solute concentration
- d. both a & b

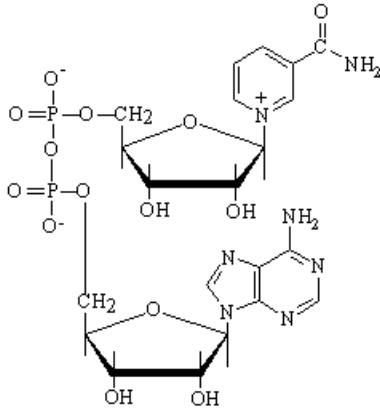
20. In the most general sense, a molecule that is "reduced" is one that has:

- a. gained an oxygen.
- b. lost an electron.
- c. gained an electron.
- d. lost an oxygen.

Indicate appropriate structure on diagram below. Answers may be used more than once.

- 21. electron transport chain
- 22. pyruvate
- 23. NADH
- 24. Kreb's cycle
- 25. ATP





26. The molecule diagrammed above is:

- a. ATP
- b. ADP
- c. AMP
- d. NAD^+
- e. NADH

27. Comparing anaerobic and aerobic metabolism in muscle, aerobic metabolism has potentially:

- a. greater efficiency and greater power.
- b. greater efficiency but lower power.
- c. lower efficiency and lower power.
- d. lower efficiency but greater power.

28. Anaerobic metabolism is less efficient than respiration, meaning that:

- a. ATP can't be made as rapidly
- b. more oxygen is needed
- c. fewer ATP are made per glucose
- d. both a and b
- e. both a and c

29. A champion weight lifter would probably have unusually high concentrations of the enzymes of:

- a. Krebs's cycle
- b. glycolysis

30. Chemical reactions that transfer phosphate directly to ATP from another molecule (such as phosphoenolpyruvate) are called:

- a. substrate-level phosphorylation.
- b. oxidative phosphorylation.
- c. redox reactions.
- d. hydrolysis.

31. Krebs's cycle occurs in the:

- a. cytoplasm
- b. ribosomes
- c. cell nucleus
- d. mitochondrial matrix

32. The most important contribution of the Krebs's cycle to the overall mechanism of ATP production in an aerobic cell is:

- a. substrate level phosphorylation.
- b. pumping H^+ across the inner mitochondrial membrane..
- c. reduction of NAD^+ to NADH.
- d. all of the above

33. The main role of the electron transport chain in the mitochondrion is:

- a. substrate level phosphorylation.
- b. pumping H^+ across the inner mitochondrial membrane.
- c. reduction of NAD^+ to NADH.
- d. CO_2 production.
- e. all of the above

34. The role of oxygen in metabolic respiration is to act as a(an):

- a. enzyme.
- b. reducing agent.
- c. oxidizing agent.
- d. electron acceptor.
- e. both c and d.

35. The metabolic function of the fermentation of pyruvate to lactate is:

- a. production of lactate for the Krebs's cycle.
- b. oxidation of NADH to NAD⁺.
- c. oxidation of NAD⁺ to NADH.
- d. proton pumping.
- e. all of the above.

36. Cyanide acts as a metabolic poison because it blocks:

- a. glycolysis
- b. pyruvate fermentation
- c. glucose uptake
- d. Na/K transport
- e. electron transport

37. The energy for ATP synthase is derived from a:

- a. pH gradient
- b. proton gradient
- c. hydrogen ion gradient
- d. all of the above.

38. The transfer of light energy to chemical reactions begins with the process called:

- a. chemiosmosis
- b. carbon fixation
- c. photooxidation
- d. proton pumping
- e. hydrolysis

39. What happens in photooxidation?

- a. An image is produced.
- b. Heat is transferred to sugar.
- c. An electron gains energy.
- d. Oxygen binds to the chlorophyll.
- e. Combustion begins.

40. Plants are green because green light:

- a. has the longest wavelengths.
- b. has the highest energy per photon.
- c. is not absorbed by the pigments.
- d. is most useful for photosynthesis.

41. The light reactions of photosynthesis supply the Calvin cycle with:

- a. light
- b. CO₂
- c. H₂O
- d. ATP
- e. sugar

42. NADPH in chloroplasts is used in:

- a. electron transport for ATP synthesis.
- b. biosynthesis (Calvin cycle).
- c. pyruvate transport.
- d. photooxidation.
- e. autolysis

43. The production of carbohydrate occurs during (the)

- a. Calvin cycle
- b. electron transport
- c. chemiosmosis
- d. light reactions

44. C₄ photosynthesis:

- a. is less energy efficient than C₃
- b. is more water efficient than C₃
- c. separates CO₂ fixation and Calvin cycle
- d. utilizes PEP carboxylase
- e. all of the above

45. Pineapple plants utilize CAM. Therefore a pineapple plant must:

- a. lack stomates
- b. open stomates at night
- c. open stomates during the day
- d. keep stomates constantly open

46. Which of the following terms would apply to a chemical messenger that diffused a short distance from its source to its receptor?

- a. Endocrine
- b. Hormone
- c. Paracrine
- d. Relay
- e. Kinase

47. G-proteins generally act as:

- a. primary receptors
- b. second messengers
- c. protein kinases
- d. enzyme activators

48. A G-protein is inactivated when it hydrolyzes:

- a. the receptor
- b. the target protein
- c. the signal molecule
- d. guanosine triphosphate
- e. adenosine triphosphate

49. An endocrine that binds intracellular receptors and controls gene expression is:

- a. adenylyl cyclase
- b. epinephrine
- c. estrogen
- d. rubisco
- e. GTP

50. The most common covalent modification of an enzyme to control its activity would be catalyzed by a:

- a. steroid hormone
- b. adenylyl cyclase
- c. protein kinase
- d. calcium ion

Key for Practice Exam 2

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