UNIT B Review

SUGGESTED ANSWERS

WHAT DO YOU REMEMBER?

1. (a)
2. (b)
3. (d)
4. (c)
5. (b)
6. (c)
7. (a)
8. (c)
9. (a)
10. (b)
11. (d)

12. False. Animals have levels of organization (a hierarchy) for structure and function, including cells, tissues, organs, and organ systems.
13. False. The tissue system responsible for transporting materials around a plant is called the vascular tissue system.
14. False. The phase of the cell cycle during which DNA replicates is called interphase.
15. True
16. False. The part of a plant that contains only the male sex cells is the pollen.
17. False. Cancerous tumours may form when cells do not stop dividing.
18. False. The main function of leaves on a plant is to carry out photosynthesis.
19. False. When there is a good supply of water, the guard cells swell to open the stomata.
20. False. Arteries carry oxygenated blood from the lungs to other parts of the body.
21. bone marrow; umbilical cord blood
22. nerve; muscle
23. urinary; digestive; circulatory; respiratory
24. nervous
25. water
26. pairs; bend; straighten
27. high; low
28. differentiation
29. **(a)**(iii); **(b)**(v); **(c)**(iv); **(d)**(ii); **(e)**(i)
30. Cells divide for growth, repair, or reproduction.
31. Interphase is the phase that takes place when a cell is not undergoing mitosis or cytokinesis. During interphase, cells perform their normal function, grow, replicate DNA, and replicate organelles.
32. A cell needs to duplicate the DNA in the nucleus because both daughter cells need a full set of chromosomes.
33. The sample with more rapid cell division is the one with more cells in different stages of mitosis.

34. A cell will grow and divide if there are enough nutrients available, if its DNA is intact and not damaged, if it can replicate its DNA, and if it receives signals from the body to enter cell division.

35. Some factors that can increase the risk of cancer are genetic predisposition, smoking, excessive UV exposure, type of food eaten, and carcinogens.

36. The digestive system and the circulatory system work together to provide nutrients to all cells. The digestive system breaks food down so it can be absorbed by the circulatory system. The circulatory system transports the nutrients to all the cells in the body.

37. Plants do not have to move from place to place to survive because they can produce their own food by the process of photosynthesis that uses sunlight, carbon dioxide, and water to produce sugars for the plant.

38. Sample answer: One of the four types of tissues found in animals is epithelial tissue. Its structure—thin, smooth sheets of tightly-packed cells—supports its function of keeping the animal from dehydrating by creating a water-resistant barrier. Its structure also allows materials to move through the respiratory and digestive systems by providing a smooth lining for these systems.

WHAT DO YOU UNDERSTAND?

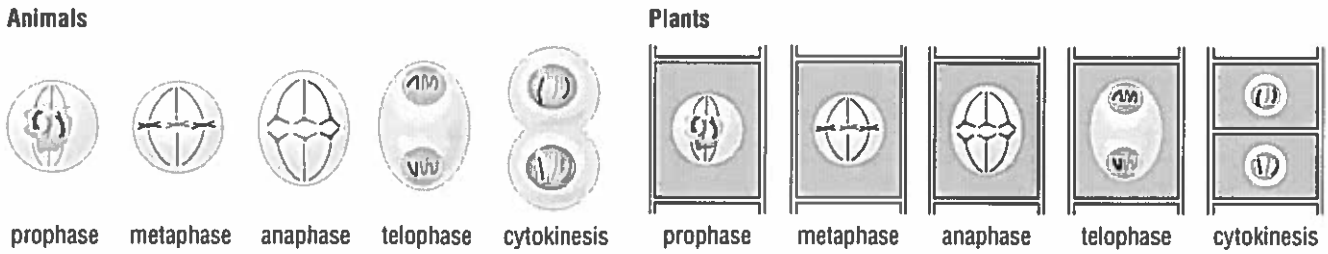
39. Roots of carrots are larger than grass roots because they are used to store starch.

40. Regeneration of tissue in the human body can be the mending of a broken bone, the healing of a cut on skin, or the healing of a torn muscle.

41. (a) Sample answer: Photosynthesis and cellular respiration are similar in that both are chemical reactions and both occur within cells. Both reactions involve the same components: carbon dioxide, water, glucose, oxygen, and energy.

    (b) Photosynthesis and cellular respiration differ because cellular respiration occurs in both plants and animals, whereas photosynthesis occurs only in plants. They also differ because photosynthesis stores energy in chemical bonds, cellular respiration releases energy in chemical bonds.

42. Mitosis in plant and animals cells is the same. During cytokinesis, plants form a cell plate between the two new daughter cells. Animals have no cell plate; the cellular membrane merely pinches off to create two new daughter cells.



43.

	Rate of cell division	Level of specialization	Length of mitosis	Appearance of cell	Ability to move
healthy cells	low	high	long cycle	regular	do not usually migrate
cancer cells	high	none	short cycle	irregular, odd shaped	able to migrate

44. MRI uses high powered magnets to obtain images inside of the body. It is used to diagnose brain injuries and many kinds of body disorders and injuries. An endoscope can use light to see inside of the body. It can diagnose cancers and look at intestinal disorders. An angiogram uses a special fluorescent dye and X-rays to get a view of the health of coronary arteries.

45. The greater the cell size, the less likely it is that the cell will be able to efficiently diffuse materials in and out. As the cell gets bigger, the volume increases faster than the surface area, meaning the volume to surface area ratio decreases, so diffusion is less efficient.

46. Smooth muscle contracts involuntarily in places like the stomach. Skeletal muscle contracts voluntarily in places like the arm or leg. Cardiac muscle exists only in the heart and is involuntary but is stimulated by nerve impulses.

47. Stem cells can be used to develop a variety of specialized cells. By making specialized cells behave as stem cells, they can be used to repair damage to the original tissue.

48. Xenotransplantation transplants organs or tissues from non-human animals into humans. Regular organ transplants transfer organs and tissues from human to human.

49. Some plants use the wind to carry pollen from one plant to another. In this case, the lighter the pollen, the farther it is likely to travel in the wind and reach another plant of the same species.

50. A plant with a very thick cuticle would be found in a dry environment, such as a desert.

51. A frog using its skin as a respiratory surface is an advantage because the frog does not need to have its head above water to take in oxygen. It is a disadvantage because the frog must keep its skin wet at all times to allow gas exchange.

52. Sample answer: Plants are used in building materials. Plants are also used to make fabric for clothing, paper and books, cosmetics, and dyes.

53. **(a)** Animal epithelial tissues make up the skin and serve as lining for intestines and other organs. They provide a protective outer surface.

    (b) Plant dermal tissues protect and cover the outside of plant surfaces.

    (c) Both are similar because they form a protective outer covering. They are different because epithelial tissue lines organs inside animals, but dermal tissue is strictly an outer covering in plants.

54. In plants, xylem and phloem transport water, minerals, and nutrients passively up and down the plant. There is no active pumping or moving. In animals such as mammals the heart actively pumps blood through a set of tubes (veins and arteries).

55. Animals must eat other things (plants or other animals) to obtain nutrients. Plants make their own nutrients using photosynthesis. The few nutrients that plant cannot make are obtained through roots in the ground.

56.

Animal	**organism**	**organ system**		**organ**	**tissue**	**cell**
example	polar bear	circulatory		heart	cardiac	muscle cell
Plant	**organism**	**body system**	**plant part**	**tissue system**	**tissue**	**cell**
example	oak tree	shoot system	leaf	dermal	epidermal	guard cell

57.

	Natural	**Artificial**	
		type	**success**
Plants	from buds, cuttings	tissue culture propagation	very successful
Animals	asexual reproduction in insects, lizards, some birds	frogs, mice, sheep	clones are often not healthy