

## SCIENCE 9 REVIEW – UNIT A

1. The function of the nucleolus is
  - A. to protect the nucleus
  - B. to protect the chromosomes
  - C. to make ribosomes
  - D. to make DNA
2. Which of the following organelles does not have a membrane?
  - A. mitochondrion
  - B. vesicle
  - C. vacuole
  - D. ribosome
3. Which one of the following statements is not true?
  - A. A gene stores the information to make a particular protein.
  - B. All the genes within the nucleus of a cell will be copied to make a protein at some time in the life cycle of a cell.
  - C. Different types of cells in your body contain the same genetic information.
  - D. Different proteins have different sequences of bases.
4. The function of the Golgi body is
  - A. to receive vesicles from the endoplasmic reticulum
  - B. to send vesicles to the endoplasmic reticulum
  - C. to receive messages from the nucleus
  - D. to send messages to the nucleus
5. Which of the following steps for the production of a protein is incorrect?
  - A. The DNA message for a protein is copied into RNA.
  - B. The nucleus receives a chemical signal to make a specific protein.
  - C. The manufactured protein enters the endoplasmic reticulum.
  - D. DNA leaves through the nuclear pore.
6. Chromatin is
  - A. a substance that contains several molecules of DNA within each strand
  - B. a substance within the nucleus that contains DNA and proteins
  - C. a substance that unfolds before cell division
  - D. a segment of DNA that codes for a particular protein
7. A gene mutation is
  - A. a change in the specific order of the A, G, C, and T bases that make up a particular protein
  - B. a change in the specific order of the sugar and phosphates that make up a particular protein
  - C. a substance that changes the DNA structure
  - D. a substance that causes genes to be copied incorrectly

8. Cystic fibrosis is
  - A. an example of a neutral mutation
  - B. an example of a positive mutation
  - C. an example of a negative mutation
  - D. the result of the substitution for the base A for the T base in only one position on the gene
  
9. The white coat of the Spirit Bear is because of a
  - A. positive mutation
  - B. neutral mutation
  - C. negative mutation
  - D. gene therapy
  
10. The three stages of the cell cycle in order are
  - A. interphase, cytokinesis, and mitosis
  - B. interphase, replication and cytokinesis
  - C. cytokinesis, replication, and interphase
  - D. interphase, mitosis, and cytokinesis.
  
11. The purpose of DNA replication is to
  - A. separate the DNA strands
  - B. separate the contents of the cell's nucleus
  - C. pair new bases with bases on the original DNA
  - D. make an identical copy of the DNA
  
12. Which of the following is the correct order of the stages of mitosis?
  - A. telophase, anaphase, metaphase, prophase
  - B. anaphase, metaphase, prophase, telophase
  - C. anaphase, prophase, metaphase, telophase
  - D. prophase, metaphase, anaphase, telophase
  
13. How does the cell cycle differ in plants and animals?
  - A. In plants, the daughter cells are not identical to the parent.
  - B. In plants, a cell plate forms between the daughter cells.
  - C. In plants, there are no spindle fibres formed.
  - D. In plants, the centrioles move to opposite poles.
  
14. Which of the following descriptions does not describe cancer cell growth?
  - A. Cancer cell growth is highly controlled.
  - B. Cancer cell has large abnormal nucleus.
  - C. Cancer cells move to new locations.
  - D. Cancer cells are unspecialized.

15. Which of the following organisms is not matched with its method of asexual reproduction?
- A. yeast, budding
  - B. hydra, binary fission
  - C. sea star, fragmentation
  - D. bacteria, spores
16. If one cell divided once every hour, how many cells would be produced after eight hours?
- A. 16
  - B. 32
  - C. 64
  - D. 256
17. Which of the following is a disadvantage of asexual reproduction?
- A. Offspring are genetic clones.
  - B. Many offspring are produced.
  - C. Energy is not required to find a mate.
  - D. Large colonies are produced.
18. Which of the following is not a method of vegetative reproduction?
- A. forming bulbs
  - B. forming sprouts
  - C. forming runners
  - D. forming spores
19. Which of the following are the correct steps in DNA replication?
1. Each side of the ladder is a template on which a new side forms.
  2. Enzymes separate the DNA molecule.
  3. New bases pair with bases on the original DNA strand.
  4. The DNA molecule unwinds.
- A. 1, 2, 3, 4
  - B. 2, 4, 1, 3
  - C. 3, 2, 4, 1
  - D. 4, 2, 1, 3
20. Which of the following is the correct order in sexual reproduction?
- A. meiosis, gamete, fertilization, embryo
  - B. gamete, meiosis, fertilization, embryo
  - C. fertilization, meiosis, gamete, embryo
  - D. gamete, fertilization, meiosis, embryo

21. Mitosis is similar to meiosis II because
- A. in both processes, the number of chromosomes is doubled
  - B. in both processes, identical daughter cells are produced
  - C. in both processes, sister chromatids separate and move to opposite poles
  - D. in both processes, homologous chromosomes separate and move to opposite poles
22. Which of the following events occurs in mitosis only?
- A. produces genetically different cells
  - B. produces haploid cells
  - C. cells divide two times
  - D. produces genetically identical cells
23. Gamete formation in males is different than in females because
- A. in males, meiosis begins before birth and stops until puberty
  - B. in males, meiosis II occurs before meiosis I
  - C. in males, there is equal distribution of cytoplasm into four cells
  - D. in males, there is unequal distribution of cytoplasm into four cells
24. A mutation that would be inherited must occur in a
- A. skin cell
  - B. egg cell
  - C. muscle cell
  - D. cancer cell
25. Cow body cells have 60 chromosomes. How many chromosomes will be in a sperm cell following meiosis II?
- A. 30
  - B. 60
  - C. 120
  - D. 15
26. What is the main advantage of sexual reproduction?
- A. Very little energy is required to find a mate.
  - B. Fewer offspring are produced.
  - C. The embryo is protected from dehydration.
  - D. The offspring are genetically different from the parents.
27. A skin cell functions differently than a muscle cell because
- A. there are different genes in each cell
  - B. there are different DNA molecules in each cell
  - C. different proteins are made in each cell
  - D. different genes are made in each cell

28. RNA is an important molecule in the cell because it
- A. carries information from one generation to the next
  - B. carries information from the cell to the rest of the body
  - C. carries information from the ribosome to the nucleus
  - D. carries information from the nucleus to the cytoplasm
29. If one side of a DNA molecule had the bases ACGTTGACT, the order of the bases on the other side of the strand would be
- A. ACGTTGACT
  - B. TGCAACTGA
  - C. GTACCAGTC
  - D. CGCAACTA
30. Which is not a use for gene therapy?
- A. to clone an organism
  - B. to replace a mutated gene with a healthy gene
  - C. to deliver healthy genes using inactive viruses to treat cystic fibrosis
  - D. to alter the immune system
31. Which of the following is not a step in DNA replication?
- A. The DNA molecule unwinds.
  - B. The steps of the DNA ladder break apart to form a template.
  - C. The RNA is copied from the DNA molecule.
  - D. The new side forms and A pairs with T and G pairs with C.
32. People with Down syndrome have
- A. 47 chromosomes in their karyotype
  - B. 45 chromosomes in their karyotype
  - C. three copies of chromosome 18
  - D. one copy of chromosome 21
33. Which event in prophase of mitosis is incorrect?
- A. The nucleolus disappears.
  - B. Centromeres pull apart.
  - C. Spindle fibres form.
  - D. Individual chromosomes attach to spindle fibres.
34. Which of the following best describes the events of anaphase 1?
- A. Homologous chromosomes pair up at the equator.
  - B. One chromosome from each homologous pair is at each pole of the cell.
  - C. The centromere pulls apart, and the sister chromatids separate and are pulled to opposite poles by the spindle fibres.
  - D. Homologous chromosomes attached to centromeres separate and are pulled to opposite poles by the spindle fibres.

35. Explain how the nucleus controls the activities within a cell.

36. What are three causes of gene mutations?

37. (a) How are binary fission and budding similar?

(b) How are binary fission and budding different?

38. Explain the disadvantages of asexual reproduction.

39. Explain how the events of sexual reproduction produce variation in a species.

40. Explain how sexual reproduction by internal fertilization provides advantages over external fertilization.

41. What are three advantages of assisted reproductive technologies?

42. How does the nucleus control the functions of life?

43. Why is interphase important for the cell and cell cycle?

44. (a) List three types of asexual reproduction.

(b) Provide an example of each type.

45. (a) What are mutations?

(b) How are mutations caused?