REVIEW: UNIT 1: Reproduction

SNC1D 05-06

1. The nucleus is responsible for storing the DNA that directs all cell activities.
2. Animal cells contain chloroplasts, an organelle that contains chlorophyll. This allows animal cells to make their own food through a process called photosynthesis.
3. In anaphase, the centromeres split and the spindle fibres pull the sister chromatids apart to the same sides of the cell.

(False: Anaphase begins when the centromeres split and the spindle fibres pull the sister chromatids apart to the opposite sides of the cell.)

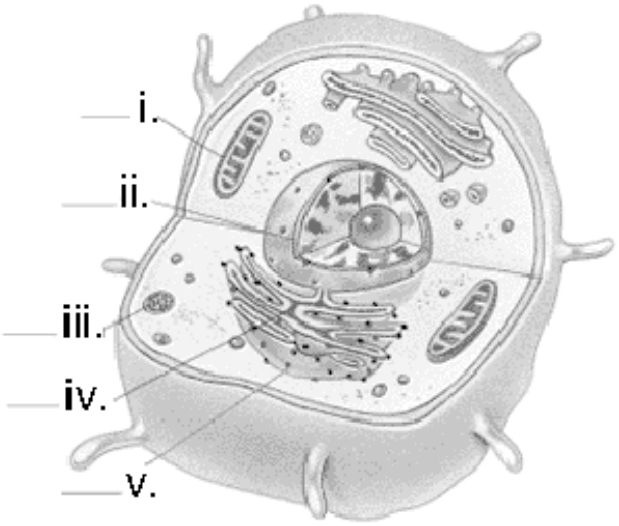
4. Mitosis and binary fission are forms of asexual reproduction.
5. Specialized growing areas are found in the roots and stems of plants and allow them to reproduce asexually through their lifetime.
6. Mitosis is a process in which cells divide, producing identical daughter cells.

[Answer: 1. T, 2. F 3. F 4. T 5. T 6. T]

7. Label the organelles of the cell:

a breaks down food and worn out cells
b produces proteins
c transports materials
d transforms energy
e encloses the cell's genetic material

[Ans: i. d; ii. e; iii. a; iv. c; v. b]



8. Phases of mitosis

A	B
____ i. DNA replicates.	a telophase
____ ii. Centromeres divide.	b anaphase
____ iii. Spindle fibres appear.	c prophase
____ iv. Chromosomes form a line across the equator.	d metaphase
____ v. Nuclear membrane reappears.	e interphase

[Ans: i. e; ii. b; iii. c; iv. d; v. a]

9. The _____ is made up of unspecialized cells that repeatedly undergo mitosis and cell division, producing new cells. [Ans: meristem]

10. Identify and describe <u>binary fission, budding, mitosis, fragmentation and spores</u> as methods of asexual reproduction. Give an example of an organism for each one.

Answer:

<u>binary fission</u> - A parent cell divides so that each new cell contains a single chromosome with a complete set of DNA (e.g., bacteria).

<u>budding</u> - A tiny bud, with an identical copy of DNA, forms at the base of an organism, grows, and eventually breaks free to create a new individual (e.g., yeast cell).

<u>mitosis</u> - Two new, identical nuclei are formed prior to the division of the cell (e.g., amoeba).

<u>fragmentation</u> - A small piece of an organism breaks away and becomes a new individual (e.g., fungi).

<u>spores</u> - Reproductive cells are produced and eventually grow into a new organism through mitotic cell division (e.g., moulds).

[Note: The 4 phases of mitosis are:
Phase 1 - nucleus and nuclear membrane disappear, spindle fibres begin to form.
Phase 2 - double-stranded chromosomes pulled into line across the middle of the cell.
Phase 3 - Spindle fibres pull centromeres apart. One of each replicated strand moves to opposite poles of the cell.
Phase 4 - Nuclear membrane reforms.]

11. Phases of meiosis.

A	B
____ i. Homologous chromosomes line up at the equator.	a prophase I
____ ii. Crossing-over occurs.	b anaphase II
____ iii. Individual chromatids separate and move to opposite poles.	c metaphase I
____ iv. Individual chromosomes line up at the equator.	d metaphase II
____ v. Chromosomes arrive at the poles and cell division begins.	e telophase II

[Answer: i. c; ii. a; iii. b; iv. d; v. e]

12. The seeds of _____ form inside flowers. [Answer: angiosperms]

13. What are the two functions of meiosis?
[Answer: 1. Produce gametes that have different combinations of chromosomes.
2. Produce gametes that contain only one half-set of chromosomes.]

14. Use an example to explain the meaning of "hermaphrodite."
[Answer: 1. An organism that has both female and male reproductive organs.
2. For example, the earthworm.]

15. Follicle stimulating hormone stimulates the ovaries to produce ova._____ (T)

16. Estrogen is responsible for producing secondary sex characteristics in males: _____ (F)
[Answer: False - Estrogen is responsible for producing secondary sex characteristics in females.
or: Testosterone is responsible for producing secondary sex characteristics in males.]

17. Progesterone is released by a structure in the ovary called the follicle: _____ (F)
[Answer: False - Progesterone is released by a structure in the ovary called the corpus luteum.]

18. Fertilization takes place in the ovary. [Answer: False - Fertilization takes place in the oviduct.]

19. Hormones involved in the menstrual cycle.

A	B
____ i. Stimulates follicles to develop.	a estrogen
____ ii. Induces ovulation.	b thyroxin
____ iii. Maintains a pregnancy.	c FSH
____ iv. Stimulates follicle to develop into corpus luteum.	d LH
____ v. Inhibited by luteinising hormone.	e testosterone
	f progesterone

[Answer: i. c; ii. d; iii. f; iv. d; v. a]

20. Stages of pregnancy.

A	B
____ i. Oxytocin is produced, which stimulates labour.	a first trimester
____ ii. Limbs, eyes, and spine begin to form.	b second trimester
____ iii. There is a rapid increase in overall size.	c third trimester
____ iv. Fetal movement can be detected.	d birth
____ v. The immune system develops.	

[Answer: i. d; ii. a; iii. c; iv. b; v. c]

21. Which of the following hormones does the pituitary gland produce? [D]
A) estrogen B) FSH C) LH D) both B and C

22. Which of the following events occur during the second trimester? [D]
A) The skeleton begins to form.
B) The nervous system begins to function.
C) The brain grows rapidly.
D) All of the above events occur.

23. a) What are hormones? Explain what they do.
b) Give an example of a hormone and describe its function in the human body.
[Answer: a) 1. Substances that act like messengers in the body.
2. Hormones travel through the bloodstream and
3. cause certain cells to respond in specific ways.
b) Examples of hormones and their related function:
Estrogen - tells the uterus to prepare for a pregnancy
Progesterone - maintains a pregnancy
LH - stimulates ovulation
FSH - stimulates follicular development

24. a) Name two pituitary hormones.
b) Name two ovarian hormones
c) Describe how the function of pituitary hormones differs from that of ovarian hormones.
[Answer: a) 1. FSH, 2. LH
b) 1. estrogen, 2. progesterone
c) Pituitary hormones tell the ovaries what to do.
Ovarian hormones tell the uterus what to do.]

25. Embryos of different vertebrates all appear very similar to one another in the first stage of fetal growth. Why does this change in later development?
[Answer: Differences in differentiation or differences in "cellular" programming.]

26. a) What happens in gastrulation?
b) Draw and label a diagram of what forms during the process of gastrulation.
c) Briefly describe the eventual outcome of each layer as the fetus develops.
[Answer: a) The cells of the growing embryo become arranged to create germ layers.
c) Ectoderm - forms the skin and nervous system
Mesoderm- forms the kidneys, skeleton, muscles, blood vessels, and gonads
Endoderm - forms the lungs and the lining of the digestive tract]

27. During what stage of pregnancy is the fetus most vulnerable? Explain.
[Answer: 1. The first trimester.
2. All the major organs begin their development in the first trimester.]

28. a) How does the pituitary gland affect the uterus during the menstrual cycle?
b) Describe specific hormones that are involved and their roles.
c) Which hormones directly affect the uterus?
[Answer: a) The pituitary gland affects the uterus indirectly.
b) The pituitary gland releases the hormone FSH, which stimulates follicles in the ovary to develop and secrete estrogen.
Estrogen causes a thickening of the uterine lining.
Increased levels of estrogen signal the pituitary gland to release LH, which stimulates ovaries to release estrogen and progesterone to further increase thickening of the uterine lining.
c) estrogen and progesterone

29. The birth control pill is a combination of the hormones estrogen and progesterone. The "pill" is one method of birth control that tricks the body into believing it is pregnant. Explain how this is possible using your knowledge of hormones and their effects.

[Answer: 1. High levels of estrogen inhibit the production of FSH. 2. If FSH is present, it stimulates an ovarian follicle to ripen. 3. In the absence of FSH, no follicle will ripen and therefore a pregnancy cannot occur. 4. High levels of progesterone act to maintain a pregnancy and 5. effectively inhibit the production of LH. 6. LH stimulates ovulation. 7. In the absence of LH, ovulation will not occur.]

30. Describe two ways that a decrease in the level of progesterone affects a pregnant mother.

Answer: 1. A decrease in the level of progesterone causes the muscles of the uterus to begin to contract, and 2. stimulates the production of a hormone called oxytocin, 3. which stimulates the uterus to further contract and open the birth canal.]

31. A gene is a segment of DNA that is coded to produce a _____ . [Answer: protein]

32. All of the genes found in a complete set of chromosomes make up a _____ .

[Answer: genome]

33. What is DNA composed of? [Answer: D]
A) phosphates B) nitrogenous bases C) sugars D) all of the above

34. A transgenic organism ... [Answer: D]
A) is created from new combinations of genes from different organisms.
B) is the product of recombinant DNA technology.
C) can be used to produce new proteins.
D) all of the above

35. Create a concept map about puberty showing the relationship between each of the following terms: FSH, puberty, a hormone, sperm, eggs, pituitary gland, testes, testosterone, ovaries, estrogen, secondary sexual characteristics. It is possible to use a term more than once.

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