Chapter 10 – The Cell Cycle, Mitosis, and Meiosis Practice Test

1. A cell’s size is limited because as it grows
   A. it places more demands on its DNA.
   B. it can’t move materials into and out of the cell efficiently and effectively.
   C. its surface area to volume ratio decreases.
   D. All of the above

2. Why does the surface area to volume ratio decrease as a cell grows?
   A. The surface area grows as the volume gets smaller.
   B. The surface area gets smaller as the volume gets larger.
   C. The surface area and volume increase at the same rate.
   D. The surface area does not grow as quickly as the volume. {If a cell grows, neither the SA nor the vol would get smaller!}

3. What happens to the surface area to volume ratio when a cell divides?
   A. It decreases.
   B. It increases.
   C. It stays the same.
   D. It fluctuates.

4. If a cube has sides that are 5cm long, what is its surface area to volume ratio?
   A. 150cm: 125cm
   B. 150cm²: 125cm³
   C. 125cm²: 150cm³
   D. 3:1

5. As a cell grows, it places more demands on the cell’s DNA because
   A. the cell’s DNA does not replicate to share its job.
   B. the cell requires more enzymes.
   C. the cell’s DNA does not increase its rate of transcription.
   D. All of the above.

6. If the surface area to volume ratio decreases, it means that
   A. the volume can’t keep up with cell membrane.
   B. the cell membrane can’t keep up with the volume. {Surface area of a cell = cell membrane}
   C. the cell membrane is keeping up with the volume.
   D. the volume is keeping up with the cell membrane.

7. The process that splits apart a cell is known as
   A. mitosis.
   B. cell division.
   C. replication.
   D. transcription.

8. What are the four phases of the cell cycle?
   A. G1 phase, S phase, G2 phase, M phase
   B. Prophase, Metaphase, Anaphase, Telophase
   C. Guanine, Adenine, Cytosine, Thymine
   D. Interphase, G1 phase, G2 Phase, M phase {G1, S, G2 = Interphase \ M phase = mitosis and cytokinesis}
Use Figure 10.1 to answer questions #9 - 11

**Mitosis**

A. B. C. D.

9. Which event **MOST LIKELY** occurs next in mitosis?
   A. The chromatin condenses to chromosomes.
   B. The nuclear envelope dissolves.
   C. The spindle fibers separate the sister chromatids.
   D. The chromosomes uncoil to chromatin.  **Occurs in telophase.**

10. How many replicated chromosomes are shown in cell B in Figure 10.1?
    A. 2
    B. 3
    C. 4
    D. 5

11. Which picture in Figure 10.1 shows **anaphase**?
    A. A.
    B. B.
    C. C.
    D. D.

12. When does replication of DNA occur in cells?
    A. G1 phase
    B. S phase
    C. G2 phase
    D. M phase

13. What structure produces spindle fibers to separate the sister chromatids?
    A. Centrioles
    B. Chromosomes
    C. Centromeres
    D. Chromatin

14. What process attaches spindle fibers to the chromosomes at the middle of the cell?
    A. Prophase
    B. Metaphase
    C. Anaphase
    D. Telophase

15. After cell division following **mitosis** the resulting two cells are
    A. genetically identical diploid daughter cells.
    B. genetically identical haploid cells.
    C. genetically different diploid daughter cells.
    D. genetically different haploid cells.

16. After cell division following **meiosis** the resulting cells are
    A. genetically identical diploid daughter cells.
    B. genetically identical haploid cells.
    C. genetically different diploid daughter cells.
    D. genetically different haploid cells.
17. Which is in the correct order from smallest to largest?
   A. DNA, chromatin, chromosomes
   B. DNA, chromosomes, chromatin
   C. Chromosomes, DNA, chromatin
   D. Chromosomes, chromatin, DNA

18. Meiosis is the process that produces
   A. haploid cells.
   B. gametes.
   C. sex cells.
   D. all the above.

19. In meiosis, **tetrads** form when
   A. homologous chromosomes pair up.
   B. sister chromatids separate.
   C. DNA replicates.
   D. DNA is transcribed.

20. In meiosis, when do the diploid cells become haploid?
   A. Meiosis I
   B. Meiosis II
   C. Mitosis
   D. Both A and B.

21. Parts of sister chromatids break off and switch places with the homologous pair during
   A. crossing over.
   B. replication.
   C. transcription.
   D. photosynthesis.

22. A gamete is
   A. a haploid cell.
   B. a diploid cell.
   C. a fertilized egg.
   D. produced by mitosis.

23. In diploid cells
   A. chromosomes are found in homologous pairs.
   B. there are two chromosomes of the same size and shape.
   C. one set of chromosomes is from the male, the other is from the female.
   D. all of the above.

*Use Figure 10.2 to answer question #24.*

<table>
<thead>
<tr>
<th>Row</th>
<th>Formation of Egg</th>
<th>Formation of Sperm</th>
<th>Growth of Embryo</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Mitosis</td>
<td>Mitosis</td>
<td>Meiosis</td>
</tr>
<tr>
<td>(2)</td>
<td>Mitosis</td>
<td>Meiosis</td>
<td>Mitosis</td>
</tr>
<tr>
<td>(3)</td>
<td>Meiosis</td>
<td>Mitosis</td>
<td>Meiosis</td>
</tr>
<tr>
<td>(4)</td>
<td>Meiosis</td>
<td>Meiosis</td>
<td>Mitosis</td>
</tr>
</tbody>
</table>

24. Which row shows the correct process for the correct event?
   A. Row (1)
   B. Row (2)
   C. Row (3)
   D. Row (4)

Egg and sperm cells are produced by meiosis. An embryo is made of somatic cells; therefore, its growth would be through cell division via mitosis.

http://www.youtube.com/watch?v=kVMb4Js99tA
Use Figure 10.3 to answer questions 25 - 27.

25. Figure 10.3 is an illustration of
   A. a replicated chromosome.  
   B. two homologous chromatids.  
   C. a single chromatid.  
   D. a centriole.

26. In Figure 10.3, which arrow(s) point(s) to the centromere?
   A. A  
   B. B  
   C. C  
   D. D

27. In Figure 10.3, which arrow(s) point(s) to the sister chromatids?
   A. A  
   B. B  
   C. C  
   D. D