AP Biology Study Questions; THE CELL CYCLE AND MITOSIS

1. What is mitotic cell division used for in single-celled organisms? In multicellular organisms?

2. How is DNA packaged in eukaryotic organisms?

3. What is a chromosome? A chromatid? Chromatin?

4. If there are 20 centromeres in a cell, how many chromosomes are there?

5. What is a homologous pair of chromosomes?

6. What happens during each phase (G1, S, G2, mitosis, cytokinesis) of the cell cycle? Why is it referred to as a cycle?

7. Measurements of the amount of DNA per nucleus were taken on a large number of cells from a growing fungus. The measured DNA levels ranged from 3 to 6 picograms per nucleus. One nucleus had 5 picograms of DNA. What stage of the cell cycle was this nucleus in?

8. What is the "goal" of mitosis? Of cytokinesis?

9. What are microtubules and what roles do they play in mitosis?

10. How does cytokinesis differ in plant and animal cells?

11. How do the daughter cells at the end of mitosis and cytokinesis compare with their parent cell when it was in the:

1. G1 phase of the cell cycle?
2. G2 phase of the cell cycle?

12. If there are 12 chromosomes in a zygote in the G1 stage of the cell cycle:

1. How many homologous pairs are present in the cell?
2. How many chromosomes were present in the egg?
3. How many chromosomes were present in the sperm?

13. A cell containing 92 chromatids at the start of mitosis would, at its completion, produce cells containing how many chromosomes?

14. Colchicine is a drug that binds to the protein subunit of microtubules, thereby preventing microtubule formation. What would happen if sea urchin zygotes were placed into colchicine?

15. The DNA content of a group of cells was measured immediately following mitosis and found to be an average of 8 picograms of DNA per nucleus. How much DNA would the cells have:

1. At the end of S phase?
2. At the end of G2 phase?