**CELL BIOLOGY REVIEW (cont’d)**

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| **Topic from**  **HAPS Guidelines** | **Learning Outcome** | **Tortora** | **HTHS 1110 Objectives** |
| Protein synthesis | 1. Define the terms genetic code, transcription and translation. | 3.6 | Module 5 Objective 1. Define the following terms:  a. genetic code  b. transcription  c. translation |
| 1. Explain how and why RNA is synthesized. | 3.6 | Module 5 Objective 2. Explain the role of RNA in the cell. |
| 1. Explain the roles of tRNA, mRNA, and rRNA in protein synthesis. | 3.6 | Module 5 Objective 3. Summarize the roles of tRNA, mRNA and rRNA in protein synthesis. |
| Somatic cell division | 1. Referring to a generalized cell cycle, including interphase and the stages of mitosis: |  | Module 5 Objective 4. Understand the cell cycle. Describe the events that take place in each stage. Be able to recognize each stage in diagrams or photographs. Know the functional significance of each stage. |
| 1. Describe the events that take place in each stage. | 3.7 |
| 1. Identify cells that are in each stage. | 3.7 |
| 1. Analyze the functional significance of each stage. | 3.7 |
| 1. Distinguish between mitosis and cytokinesis. | 3.7 | Module 5 Objective 5. Distinguish between mitosis and cytokinesis. |
| 1. Describe DNA replication. | 3.7 | Module 5 Objective 6. Describe the process of DNA replication and its relationship to the cell cycle. |
| 1. Analyze the interrelationships among chromatin, chromosomes and chromatids. |  | Module 5 Objective 7. Define, and be able to compare and contrast:  a. chromatin  b. chromosomes  c. chromatids |
| 1. Give examples of cell types in the body that divide by mitosis and examples of circumstances in the body that require mitotic cell division. |  | Module 5 Objective 4. Understand the cell cycle. Describe the events that take place in each stage. Be able to recognize each stage in diagrams or photographs. Know the functional significance of each stage. |
| Reproductive cell division | 1. Describe the events that take place in each stage of meiosis I and meiosis II. | 3.7 | Module 5 Objective 8. Define meiosis. Know which cells undergo mitosis or meiosis and the functional significance of the difference. Compare and contrast mitosis and meiosis with respect to:  a. the cell types involved;  b. meiosis I;  c. meiosis II. |
| 1. Identify cells that are in each stage of meiosis I and meiosis II. | 3.7 |
| 1. Compare and contrast the general features of meiosis I and meiosis II. | 3.7 |
| 1. Compare and contrast the processes of mitosis and meiosis. | 3.7 |
| 1. Give examples of cell types in the body that divide by meiosis and examples of circumstances in the body that require meiotic cell division. | 28.1  28.2 |
| Application of homeostatic mechanisms | 1. Provide specific examples to demonstrate how individual cells respond to their environment (e.g., in terms of organelle function, transport processes, protein synthesis, or regulation of cell cycle) in order to maintain homeostasis in the body. |  | Module 5 Objective 9. Given an example of a homeostatic mechanism, understand which parts of the cell are used to carry out the mechanism. |
| Predictions related to homeostatic imbalance,  including disease states & disorders | 1. Predict factors or situations that could disrupt organelle function, transport processes, protein synthesis, or the cell cycle. |  | Module 5 Objective 10. Predict factors or situations that could disrupt organelle function, transport processes, protein synthesis, or the cell cycle. Understand the problems that would occur in each instance. |
| 1. Predict the types of problems that would occur if the cells could not maintain homeostasis due to abnormalities in organelle function, transport processes, protein synthesis, or the cell cycle. |  |