

1. Explain the following terms: (25%)
 - a. Encapsulation
 - b. Polymorphism
 - c. Data Schema
 - d. Java Applet
 - e. Multiplexing

2. Answer the following questions. (25%).
 - a. What are the differences between "Data" and "Information"?
 - b. What are the differences and relationship between "Object" and "Class"?
 - c. What are the components of a database system?
 - d. What are the steps of Object-Oriented Modeling?
 - e. What are the main functions of Operating System (OS)?

3. Write a **Recursive** algorithm for $2 + 3 + 4 \dots + 100$. (10%)

4. Suppose that A is a **two-dimensional array**, and the addresses of A(1, 1) and A(3, 3) are 622 and 654 respectively. Please compute the address of A(13, 13). (10%)

5. Analyze the time complexity of **Quick Sort** in the worst case, best case and average case. (15%)

6. List at least three types of Network Topology and describe the advantages and disadvantages for each of them. (15%)