

Set Number - 2

1. Explain the concept of a deadlock in a distributed system and its challenges. Describe possible solutions to handle deadlocks in such systems?
2. Explain the concept of a resource allocation graph and its use in deadlock detection. Provide a detailed example?
3. Describe the concept of a deadlock and its types (e.g., livelock, starvation). Explain each type with an example?
4. Explain the concept of a safe sequence in deadlock avoidance. How is it used to prevent deadlocks?
5. Consider a system with 5 processes (P1-P5) and 3 resource types (A, B, C). The available resources are $A = 15$, $B = 10$, $C = 12$. Given the maximum need and allocated resources, determine whether a deadlock exists using the Banker's Algorithm?
6. Discuss a real-world example of a deadlock in a file system (e.g., file locking deadlocks). Suggest possible solutions to avoid it?
7. What is the difference between a safe state and an unsafe state in deadlock avoidance? Provide a scenario to illustrate this?
8. Consider a system with 3 processes (P1-P3) and 2 resource types (A, B). The available resources are $A = 5$, $B = 3$. Given the maximum need and allocated resources, determine whether a deadlock exists using the Banker's Algorithm?
9. How does the Banker's Algorithm handle resource deallocation in a system? Explain with an example?

10. Explain the concept of a resource allocation graph and its use in deadlock detection. Provide a detailed example and explain its advantages?
11. Describe the four necessary conditions for a deadlock to occur, as stated by Coffman. Explain each condition?
12. Discuss a real-world example of a deadlock in a traffic system (e.g., traffic light deadlocks). Suggest possible solutions to avoid it?
13. Explain the concept of deadlock recovery and its methods (e.g., process termination, resource preemption). Describe each method with an example?
14. Discuss a real-world example of a deadlock in an operating system (e.g., process scheduling deadlocks). Suggest possible solutions to avoid it?
15. Discuss a real-world example of a deadlock in a database system (e.g., transactional deadlocks). Suggest possible solutions to avoid it?
16. How does a Wait-For Graph help in detecting deadlocks in a system? Explain with a detailed example?
17. What is the difference between deadlock prevention and deadlock recovery? Provide an example of each?
18. How does the Banker's Algorithm prevent deadlock? Differentiate between safe state and unsafe state in deadlock avoidance. Section B: Medium Answer Questions (3 marks each) Explain Wait-For Graph and how it is used for deadlock detection. Describe the four Coffman conditions necessary for a deadlock to occur.
19. What are the differences between the Banker's Algorithm and other deadlock prevention techniques (e.g., resource ordering)? Explain each technique with an example?

20. Explain the working of the Banker's Algorithm for deadlock prevention. Provide a step-by-step example?

