**SAVEETHA SCHOOL OF ENGINEERING**

**SAVEETHA INSTITUTE OF MEDICAL AND TECHNICAL SCIENCES**

**CLASS TEST - 4**

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| **Course Code: CSA0446** | **Course Name: Operating Systems for Scientific Applications** | |
| **Branch: CSE** | **SLOT: D** | **Year: Second** |
| **Date of Exam: 05.12.2024** | **Max. Marks: 20** | **Time: 1 Hour** |

**ANSWER ALL THE QUESTIONS**

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| **S.NO** | **QUESTION** | **MARKS** | **CO MAPPING** | **BLOOM’S TAXONOMY** |
| 1 | An operating system uses the *Banker's algorithm* for deadlock avoidance when managing the allocation of three resource types X,Y, and Z to three processes P0,P1, and P2. The table given below presents the current system state. Here, the *Allocation matrix* shows the current number of resources of each type allocated to each process and the *Max matrix*shows the maximum number of resources of each type required by each process during its execution.  **Allocation Max**  **X Y Z X Y Z**  **P0 0 0 1 8 4 3**  **P1 3 2 0 6 2 0**  **P2 2 1 1 3 3 3**  There are 3 units of type X,2 units of type Y and 2 units of type Z still available. The system is currently in a **safe**state. Consider the following independent requests for additional resources in the current state:  **REQ1**: P0 requests 0 units of X,0 units of Y and 2 units of Z  **REQ2**: P1 requests 2 units of X,0 units of Y and 0 units of Z  Which one of the following is **TRUE**?   1. Only REQ1 can be permitted. 2. Only REQ2 can be permitted. 3. Both REQ1 and REQ2 can be permitted. 4. Neither REQ1 nor REQ2 can be permitted. | 10 | CO2 | K5 |
| 2 | A system has 4 processes and 5 allocatable resource. The current allocation and maximum needs are as follows-  **Allocated Maximum**  A 1 0 2 1 1 1 1 2 1 3  B 2 0 1 1 0 2 2 2 1 0  C 1 1 0 1 1 2 1 3 1 1  D 1 1 1 1 0 1 1 2 2 0  Available = [ 0 0 X 1 1 ], what is the smallest value of x for which this is a safe state? | 10 | CO1 | K3 |

**COURSE FACULTY COURSE COORDINATOR HOD**