

Roll No.

23071

**M. Tech. 2nd Semester (Computer
Engg.) Examination – December, 2009**

RESOURCE MGT IN COMPUTER SYSTEMS

Paper : MTCE-604-A

Time : Three hours]

[Maximum Marks : 100

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

1. (a) What is an operating system and its functions ?
What are the design issues of a good operating system. 12
- (b) Differentiate between the following : $4 \times 2 = 8$
- (i) Spooling and buffering
 - (ii) Reusable and consumable Resources

2. (a) Write the necessary and sufficient conditions for the deadlock to happen. 10

(b) Construct a general resource graph for the following scenario and determine if the graph is completely reducible. R_1 , R_2 , R_3 are reusable resources with a total of 2, 2 and 3 units respectively. Process P_1 is allocated one unit each of R_2 and R_3 and is requesting one unit of R_1 . Process P_2 is allocated one unit of R_1 and is requesting two units of R_3 . Process P_3 is allocated one unit each of R_1 and R_2 and is requesting one unit of R_3 . 10

3. (a) Compare mutual exclusion in single computer systems and distributed systems. 8

(b) How Ricart-Agarwal algorithm is better than Lamport's algorithm towards achieving a critical section? Take two sites S_1 and S_2 to explain the concept. 12

4. (a) What is the difference between a process and a program ? Draw the 5-state diagram of process and explain the various states involved. 10

(b) Write parallel FORTRAN implementation of the precedence graph given in figure 1. 10

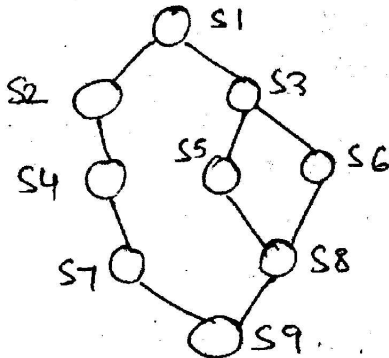


Fig. 1 The Precedence graph

5. (a) Write an algorithm for producer and consumer using a bounded buffer of size n. 10

(b) What is a monitor ? Implement Readers/writer Problem using a monitor. 10

6. (a) Why Lock-Key method is called as hybrid method ? Explain the various steps performed by this method, when a subject makes the request to access an object. 10

- (b) What is the data structure used by Take-grant method to represent the access control matrix ? List the access rights that can propagate in this method. 10

7. What are the threats to a computer system or a computer network ? Explain how access matrix model enforces a security policy in distributed systems. Give the data structures used to implement this model by capability-based addressing.

8. Write short notes on any *two* of the following :

10 × 2 = 20

- (i) Bell La Padula method
- (ii) Distributed File System
- (iii) Device Independence