

**Model Question Paper**  
**Seventh Semester B. Tech. Degree Examination**  
**(2013 Scheme)**  
**13.705.3 REAL TIME OPERATING SYSTEMS (T)**

Time : 3Hrs

Max. Marks : 100

**PART-A**

Answer **all** questions. Each question carries **2** marks.

1. Discuss the importance of kernel in an operating system.
2. Compare process and thread.
3. Describe interrupt latency.
4. Discuss about the different task classes.
5. List the features of mutex semaphore.
6. Compare rate monotonic and deadline monotonic scheduling algorithms.
7. Explain the role of events in inter task communication.
8. Draw the structure of a real time kernel and explain.
9. List the features of UNIX real time operating system.
10. Give the reasons for the message delay in real time communication.  
(2x10=20 Marks)

**PART-B**

Answer **any one** question from each module.

**Module -I**

11. a) Give a detailed description about the process components and states. (10)
- b) Discuss about the creation and termination of a process. (10)

**OR**

12. a) What do you mean by shared data problem? How the system handles it? (5)
- b) Compare the performance of FCFS and Round Robin algorithms with examples. (10)
- c) Discuss about dynamic linking and loading (5)

**Module -II**

13. a) Describe the structure of a Real Time Operating System in detail.(10)

- b) What do you mean by reentrancy? What are the conditions to be satisfied for a function to be reentrant. (6)
- c) Discuss about the steps used by the processor for handling an exception. (4)

**OR**

- 14. a) Explain the different constraints handled by real time systems. (10)
- b) Give a detailed description about the synchronization tools used RTOS. (10)

**Module -III**

- 15. a) Describe about the message queues used RTOS (10)

b) Given seven tasks, *A, B, C, D, E, F,* and *G,* construct the precedence graph

from the following precedence relations:

*A* → *C*

*B* → *C* *B* → *D*

*C* → *E* *C* → *F*

*D* → *F* *D* → *G*

Then, assuming that all tasks arrive at time  $t = 0$ , have deadline  $D = 25$ , and computation times 2, 3, 3, 5, 1, 2, 5, respectively, modify their arrival times and deadlines and schedule them by EDF. (10)

**OR**

- 16. a) Verify the schedulability under EDF of the task set given, and then construct the corresponding schedule.

	$C_i$	$T_i$
T1	1	4
T2	2	6
T3	3	8

(10)

- b) Discuss the role of mail boxes and pipes in inter task communication (6)
- c) Compare EDD and EDF algorithm for aperiodic task scheduling (4)

### **Module -III**

17. a) Draw the detailed process state transition diagram of a periodic task and explain. (10)

b) What do you mean by system overhead? How it is handled by the operating system? (4)

c) Discuss about the CAB implementation of a real time kernel (6)

**OR**

18. a) Explain the data structure of a real time kernel. (10)

b) Discuss about the task scheduling in MicroC/OS II (10)