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18EVE22

Second Semester M.Tech. Degree Examination, June/July 2019 Real Time Operating System

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. With the help of pseudocode and state diagram, explain basic real time service using polling technique. (10 Marks)
- b. Define real-time service and explain real time service time line with hardware acceleration. (10 Marks)

OR

- 2 a. Describe six real time service utility functions with relevant graph. (14 Marks)
- b. Write the state transition diagram for a thread of execution including all possible state and explain briefly. (06 Marks)

Module-2

- 3 a. With necessary assumptions explain two cases of RMLUB. (10 Marks)
- b. Describe the two algorithms for determination of N and S feasibility test. (10 Marks)

OR

- 4 a. Consider the 3 service system having following details:

Services	Execution time	Release time
S1	1	2
S2	1	4
S3	4	16

Draw the timing diagram for RM for EDF policies and comment on result. [assume $\text{prio}(S1) > \text{prio}(S2) > \text{prio}(S3)$] (12 Marks)

- b. Explain the overload scenario in RM policy and EDF policy. (08 Marks)

Module-3

- 5 a. Explain the following: i) Shared memory ii) Flash file system. (10 Marks)
- b. What do you mean by worst-case execution time of a service? Explain. (10 Marks)

OR

- 6 a. With necessary considerations, explain unbounded priority inversion. Suggest solutions to avoid it. (10 Marks)
- b. Explain the reliability of a system with a dual-string, cross-strapped sub system interconnection example. (10 Marks)

Module-4

- 7 a. Explain any 3 firmware components. (10 Marks)
- b. Explain RTOS system software mechanisms. (10 Marks)

OR

- 8 a. Explain the single step debugging used to debug errors in RTOS. (10 Marks)
b. Explain the following: i) Test access ports ii) Trace ports. (10 Marks)

Module-5

- 9 a. Explain the following with an example for each:
i) Process
ii) Thread
iii) Semaphore. (10 Marks)
b. Write a simple code to create a parent and child process. Explain the code in detail. (10 Marks)

OR

- 10 a. Explain the following with an example for each:
i) Shared buffer
ii) Message queue
iii) IPC. (10 Marks)
b. Explain the concept of semaphore with a simple code. (10 Marks)
