

CBCS SCHEME

20EVE22



Second Semester M.Tech. Degree Examination, Feb./Mar. 2022 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. Describe SIX real-time service utility functions with relevant graphs. (12 Marks)
b. Explain real time service time line with hardware acceleration. (08 Marks)

OR

- 2 a. With state transition diagram, explain the functions of various service states of a thread. (10 Marks)
b. Explain the important features RTOS. (10 Marks)

Module-2

- 3 a. Given service S_1 and S_2 with periods T_1 and T_2 , execution times C_1 and C_2 , release periods $T_2 > T_1$, $T_1 = 2$, $T_2 = 5$, $C_1 = 1$, $C_2 = 2$, if $\text{Prio}(S_1) > \text{Prio}(S_2)$. Explain RM priority assignment policy in above scenario with timing diagram. (10 Marks)
b. Explain the overload scenario in RM policy and EDF policy (10 Marks)

OR

- 4 a. Discuss two algorithms for the determination of necessary and sufficient feasibility testing with RM policy. (10 Marks)
b. With necessary assumptions, explain the two cases of RMLUB. (10 Marks)

Module-3

- 5 a. Explain the worst – case execution time of a service. (10 Marks)
b. Explain the following : i) Shared Memory ii) Flash file system. (10 Marks)

OR

- 6 a. Briefly describe dead lock and live lock. (07 Marks)
b. Explain Quality of Service (QoS) for the real time system. (07 Marks)
c. Explain the ways of handling missed deadlines in a real time system. (06 Marks)

Module-4

- 7 a. Explain message queue and Heap based message Queue in communication between tasks with the help of diagrams. (10 Marks)
b. Explain the different levels of single steps debugging. (10 Marks)

OR

- 8 a. Explain any three RTOS system software components. (10 Marks)
b. Explain test access ports and Trace Ports. (10 Marks)

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Module-5

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

OR

- 10 a. Explain the inter task communication with a simple code. (10 Marks)
b. Explain the following with an example each (10 Marks)
i) Shared Buffer ii) Message Queue iii) IPC.

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg. 42+8 = 50, will be treated as malpractice.