



# Sanjay Ghodawat University, Kolhapur

2017-18

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

FY M Tech

School of Technology

Semester I

EES 507

Real Time Operating Systems

Max Marks: 100

Dec 2017

End Semester Examination (ESE)

Time: 3 Hrs

**Instructions for Students:** 1) Use of non-programmable calculator is allowed  
2) All questions are compulsory

Q1	Attempt any two of the following	Marks	COs
a)	Differentiate between General Purpose OS and RTOS? Explain hard RTOS and Soft RTOS with example	08	CO1
b)	What is Embedded Software Architecture? Explain the various types of Embedded Software Architectures.	08	CO1
c)	Explain Round robin and RTOS architecture with the pseudo code.	08	CO1
Q2	Attempt any two of the following		
a)	Explain the use of following kernel objects with example and also explain any two OS functions related to each of these kernel objects i. Semaphores ii. Mailbox iii. Queues iv. Pipes	09	CO2
b)	What is a task? Explain different task states with task state diagram.	09	CO2
c)	What are the problems related to Semaphores? Explain the concept of Deadly Embrace and Priority Inversion with diagram.	09	CO2
Q3	Attempt any two of the following		
a)	Write a short note on the following a. Static scheduling b. Dynamic scheduling	08	CO3
b)	Explain the factors on which the Worst Case Execution Time (WCET) of a task depends	08	CO3
c)	How the Scheduling Algorithms can be classified? What is scheduling problem?	08	CO3
Q4	Attempt any two of the following		
a)	What are features of uCos-II? Explain any four task management functions.	08	CO4
b)	What are features of RTLinux? Explain each feature.	08	CO4
c)	What are configuration options available in RL-RTX.	08	CO4

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- Q5** Attempt any two of the following
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|----|---|----|-----|
| a) | What is a thread? What are advantages of threads. Distinguish between thread and process. | 09 | CO5 |
| b) | Explain user-level threads, also list its advantages and disadvantages                    | 09 | CO5 |
| c) | Explain the types of multi-threading models   | 09 | CO5 |
- Q6** Attempt any two of the following
- |    |  |    |     |
|----|--|----|-----|
| a) | Explain the architecture of FreeRTOS                   | 08 | CO6 |
| b) | Explain the use of RTOS for control system application | 08 | CO6 |
| c) | Explain how RTOS can be used in VoIP                   | 08 | CO6 |

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