



R22 Regulation

Subject code: 4P7DG

# TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

## B.Tech VII Semester Regular Examinations, November 2025

### REAL TIME OPERATING SYSTEMS

(ECE)

Maximum Marks: 60

Date: 01.12.2025

Duration: 3 hours

- Note:
1. This question paper contains two parts A and B.
  2. Part A is compulsory which carries 10 marks. Answer all questions in Part A.
  3. Part B consists of 5 Units. Answer any one full question from each unit.
  4. Each question carries 10 marks and may have a, b, c, d as sub questions.

#### Part-A

All the following questions carry equal marks (10X1M=10 Marks)		Marks	CO	BloomTx
1.a)	How does Linux differ from UNIX?	1M	1	L2
b)	How is vfork () different from fork ()?	1M	1	L2
c)	What is a Real-Time Operating System (RTOS)?	1M	2	L1
d)	List any three characteristics of an RTOS.	1M	2	L1
e)	What are the key building blocks of an RTOS besides tasks?	1M	3	L1
f)	Provide two examples of standard signals used in UNIX.	1M	3	L1
g)	How does an interrupt differ from an exception?	1M	4	L2
h)	Mention one application of a real-time clock.	1M	4	L1
i)	List any two key features of MicroC/OS-II.	1M	5	L1
j)	Compare RTLinux and VxWorks in terms of cost and flexibility.	1M	5	L2

#### Part-B

Answer All the following questions. (5X10M=50Marks)		Marks	CO	BloomTx
2	Explain the key features and architecture of UNIX/Linux operating systems.	10M	1	L5
OR				
3	Discuss process creation and management in UNIX/Linux using fork(), vfork(), exec(), and exit().	10M	1	L6
4	Discuss the role of synchronization, communication, and concurrency in RTOS design, supported by practical examples.	10M	2	L5
OR				
5	Briefly explain the history and evolution of Operating Systems. How did it lead to the development of Real-Time Operating Systems (RTOS)?	10M	2	L4
6	Describe the concepts of objects and services in an operating system and discuss their role in achieving modularity.	10M	3	L3
OR				

7	What are the key components of an operating system that manage process control and input/output (I/O) operations? Explain their functions and significance.	10M	3	L3
8	Explain the applications of interrupts in computer systems. How do they improve system efficiency?	10M	4	L5
OR				
9	How does the operating system respond to timer interrupts, and in what ways does this contribute to effective multitasking?	10M	4	L4
10	Explain the architecture and key features of MicroC/OS-II. Discuss its common applications and evaluate why it is well-suited for safety-critical systems	10M	5	L5
OR				
11	Compare Embedded Linux with traditional Real-Time Operating Systems (RTOS) by discussing their architectures, advantages, limitations, and typical use cases.	10M	5	L4