

K. J. Somaiya Institute of Technology, Sion, Mumbai-22
(Autonomous College Affiliated to University of Mumbai)

Nov – Dec 2024

(B. Tech) Program: EXTC Scheme: II

Regular Examination: LY Semester: VII

Course Code: EXDLC7033 and Course Name: **Embedded Systems & RTOS**

Date of Exam: 24/11/2024

Duration: 02.5 Hours

Max. Marks: 60

Instructions:

(1) All questions are compulsory.

(2) Draw neat diagrams wherever applicable.

(3) Assume suitable data, if necessary.

Q. No.	Question	Max. Marks	CO	BT level
Q 1	Solve any two questions out of three: (05 marks each)	10		
a)	What are the various classifications of embedded systems?		1	
b)	What is pipelining? Explain three stages of pipelining with examples.		2	
c)	With neat sketches explain Bluetooth technology.		3	
Q 2	Solve any two questions out of three: (05 marks each)	10		
a)	Explain the functions of a kernel.		4	
b)	What are the task states? Draw the state diagram of the task?		5	
c)	Draw FSM for Automatic coffee Vending machine.		6	
Q.3	Solve any two questions out of three. (10 marks each)	20		
a)	Explain all design metrics of embedded systems.		1	
b)	Draw and explain the Arm core dataflow model.		2	
c)	Draw and Explain I2C bus in detail also compare with SPI bus		3	
Q.4	Solve any two questions out of three. (10 marks each)	20		
a)	Three processes with process IDs P1, P2, P3 with estimated completion time 10, 5, 7 milliseconds respectively enter the ready queue together. A new process P4 with estimated completion time 2ms enters the 'Ready' queue after 2ms. Assume all the processes contain only CPU operation and no I/O operations are involved		4	
b)	What is mutex? What is the difference between mutex and binary semaphore?		5	
c)	Explain DFG (Data Flow Graph) and FSM (Finite State Machine) with suitable examples.		6	
