

Nov – Dec 2022 (B.Tech / M.Tech.) Program: EXTC Examination: LY Semester: VII Course Code: <del>EXDLC7033</del> EXDLC7033 and Course Name: <b>Embedded Systems &amp; RTOS</b> Duration: 2.5 Hours <span style="float:right">Max. Marks: 60</span>				
Instructions: (1) All questions are compulsory. (2) Draw neat diagrams wherever applicable. (3) Assume suitable data, if necessary.				
		Max. Marks	CO	BT level
Q 1	Solve any six questions out of eight:	12		
i)	Define Embedded System.	2	CO1	U
ii)	Define “Time-to-market”	2	CO1	U
iii)	List the functions of a kernel.	2	CO2	U
iv)	What is a CAN bus? Where is it used?	2	CO3	U
v)	What are the features of the USB protocol?	2	CO3	U
vi)	Discuss briefly about Task Scheduling.	2	CO4	U
vii)	Define deadlock?	2	CO5	U
viii)	What is Finite State Machine Model?	2	CO6	U
Q.2	Solve any four questions out of six.	16		
i)	What are the different classifications of embedded systems?	4	CO1	U
ii)	Differentiate between Harvard and Von Neuman architecture.	4	CO2	U
iii)	Explain SPI bus architecture	4	CO3	U
iv)	Compare GPOS and RTOS.	4	CO4	U
v)	What are the task states? Draw the state diagram of task?	4	CO5	U
vi)	Draw FSM for Automatic Chocolate Vending machine	4	CO6	U
Q.3	Solve any two questions out of three.	16		

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i)	Discuss briefly overview of embedded system architecture with suitable diagram.	8	CO2	U
ii)	Three processes with process IDs P1, P2, P3 with estimated completion time 6, 4, 2 milliseconds respectively, enters the ready queue together in the order P1, P2, P3. Calculate the waiting time and Turn Around Time (TAT) for each process and the Average waiting time and Turn round Time (Assuming there is no I/O waiting for the processes) in RR algorithm with Time slice= 2ms	8	CO4	A
iii)	Explain any three types of inter process communication functions between the tasks.	8	CO5	U
Q.4	Solve any two questions out of three.	16		
i)	Explain Current Program Status Register (CPSR) in detail and draw <i>cpsr=NzCvqjiFt_SVC</i> .	8	CO2	U
ii)	Draw and Explain I2C bus in detail also compare with SPI bus.	8	CO3	U
iii)	With suitable example, explain the state machine model of Smart Card	8	CO6	U

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