Q. Code: 663711

Reg. No. | | | | | | | | | | | | | | |

B.E / B.TECH. DEGREE EXAMINATIONS, MAY 2024

Seventh Semester

EC18703– EMBEDDED AND REAL TIME SYSTEMS

(Electronics and Communication Engineering)

(Regulation 2018 / 2018A)

TIME: 3 HOURS **MAX. MARKS: 100**

COURSE OUTCOMES	STATEMENT	RBT LEVEL
CO 1	Develop programs in ARM processor using ARM architecture and Instruction set.	**3**
CO 2	Interrelate the various attributes that contribute to the analysis of Program Performance in Embedded Systems.	**3**
CO 3	Compare the scheduling algorithms and Operating Systems.	**4**
CO 4	Categorize the design methodologies and Networks for embedded systems.	**4**
CO 5	Design real-time consumer/industrial applications using embedded-system concepts.	**4**

PART- A (10 x 2 = 20 Marks)

(Answer all Questions)

		CO	RBT LEVEL
1.	Mention the characteristics of embedded computing.	**1**	**1**
2.	Interpret the instruction MLS R4, R5, R6, R7.	**1**	**3**
3.	Draw a Control Data Flow Graph (CDFG) with an example.	**2**	**3**
4.	Analyze the benefits and drawbacks of Dynamic Link Libraries in a Linker.	**2**	**3**
5.	Differentiate GPOS with RTOS.	**3**	**4**
6.	What is priority inversion?	**3**	**2**
7.	Identify the issues in hardware and software design for an embedded system.	**4**	**3**
8.	What is Field bus?	**4**	**2**
9.	What are the challenges of embedded systems in industrial applications?	**5**	**1**

10.	Define Defibrillator.		**5**	**1**	

PART- B (5 x 14 = 70 Marks)

			Marks	CO	RBT LEVEL
11. (a)		Draw the architecture of ARM cortex - M4 processor and elaborate its functional units.	**(14)**	**1**	**3**
		(OR)			
(b)		Construct the interfacing of UART with ARM cortex M4 processor.	**(14)**	**1**	**3**
12. (a)		Write short notes on Assembly, Linking, Loading, and Compilation.	**(14)**	**2**	**2**
		(OR)			
(b)		Explain in detail about the concept of testing strategies in real time programming.	**(14)**	**2**	**2**
13. (a)		Outline in detail how shared memory and message passing mechanisms are used for inter process communication.	**(14)**	**3**	**4**
		(OR)			
(b)		With necessary illustrations explain about EDF algorithm for scheduling three process with hyper period 60.	**(14)**	**3**	**4**
14. (a)	**(i)**	Illustrate the system design methods using water fall, spiral, and successive refinement model.	**(10)**	**4**	**3**
	(ii)	Mention the services of Quality Assurance Techniques in embedded systems.	**(4)**	**4**	**3**
		(OR)			
(b)	**(i)**	Identify how the I^2C and Ethernet interfaces are useful for embedded systems.	**(10)**	**4**	**3**
	(ii)	Mention the services of Field bus in embedded systems.	**(4)**	**4**	**3**
15. (a)		Design an Engine Control unit and enumerate its requirements, system architecture, and integration.	**(14)**	**5**	**3**
		(OR)			
(b)		Design a Pacemaker and enumerate its requirements, system architecture, and integration.	**(14)**	**5**	**3**

PART- C (1 x 10 = 10 Marks)

(Q.No.16 is compulsory)

		Marks	CO	RBT LEVEL
16.	With necessary illustrations evaluate in details about POSIX and Windows CE RTOS with respect to processes, kernels and real time scheduling.	**(10)**	**3**	**5**

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