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Question Paper Code:1067017

B.E. / B.Tech. DEGREE EXAMINATIONS, NOV/ DEC 2024
Seventh Semester
Electronics and Communication Engineering
EC8791 - EMBEDDED AND REAL TIME SYSTEMS
(Regulation 2017)

Time: Three Hours Maximum: 100 Marks

Answer ALL questions

PART – A (10 x 2 = 20 Marks)

1. Compare and contrast top-down and bottom-up design.

2. How to evaluate the platform-level performance analysis of an embedded system?

3. Write ALP program to add array of 16 bit numbers and store the result in 32 bit memory.

4. Mention the steps followed by an ARM Cortex M3 MCU when responding to an interrupt.

5. What are the software components of an embedded system?

6. Is embedded testing easy or difficult? give a reason.

7. Analyze how accurate time management is achieved in real time kernel?

8. Why is clock synchronization between RTOS systems so important?

9. Define multirate systems and give two real time examples.

10. Compare the major functionalities of POSIX RTOS and Windows CE.

PART – B (5 x 16 = 80 Marks)

11. (a) Develop the requirement, specification and state diagram of a model train controller with necessary illustrations. (16)

(OR)

(b) Elaborate in detail about the various Quality Assurance techniques used for evaluating the embedded systems. (16)

12. (a) Classify the ARM instruction set and explain any one type of instruction set with example. (16)

(OR)

(b) Draw the architecture of ARM 9 processor and explain its functional units. Also, explain in detail about the various operating modes supported by the ARM 9 processor. (16)

13. (a) Illustrate the flow of program generation from compilation through loading. Specify the roles of assemblers and linkers in the compilation process. (16)

(OR)

(b) Outline the Program level energy and Power analysis and optimization. (16)

14. (a) For the process shown below:

Process	Execution Time	Period
P1	1	4
P2	2	6
P3	3	12

Schedule using Rate Monotonic Scheduling (RMS) policy. Compute the schedule for an interval equal to the least-common multiple of the periods of the processes. Assume the time starts at t=0. (16)

(OR)

(b) Design a clock synchronization protocol that includes mechanisms for fault tolerance. (16)

15. (a) With suitable examples, explain briefly about the co-operative multitasking and pre-emptive multitasking. (16)

(OR)

(b) With relevant illustrations explain the architecture of Video Accelerators. Elaborate in detail component design and system testing of the same. (16)

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