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**Question Paper Code : 31318**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Sixth Semester

Electronics and Instrumentation Engineering

CS 2364/EI 64/10133 EE 703 — EMBEDDED SYSTEMS

(Common to Instrumentation and Control Engineering)

(Regulation 2008/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL the questions.

PART A — (10 × 2 = 20 marks)

1. What is a 'Real Time System'?
2. Write the functions of One Time Device programmer.
3. What are the differences between a Half Duplex and Full Duplex data transfer?
4. Justify why Embedded system design is so complex.
5. What are the advantages of USB bus?
6. What are preprocessor macros?
7. Distinguish between a task and a process.
8. List out the various components of process control block.
9. Compare and contrast the binary semaphore and counting semaphore.
10. Write the advantages of mail boxes in RTOS.

PART B — (5 × 16 = 80 marks)

11. (a) Explain in detail about the different 'Embedded Processors' in a system.  
Or
- (b) (i) Explain the different types of 'Single purpose processors'. (8)  
(ii) Discuss the different modules of a modern embedded system. (8)
12. (a) (i) Describe the various components of Synchronous Serial Input and Output ports.  
(ii) Explain the features and characteristics of Asynchronous Serial Input and Output port.  
Or
- (b) Write a detailed technical short note on the characteristics of the following:  
(i) I<sup>2</sup>C Bus (8)  
(ii) CAN Bus. (8)
13. (a) Explain how stack data structures is useful to embedded system programming.  
Or
- (b) Explain the following data structures with suitable diagram.  
(i) Circular Queue (4)  
(ii) Pipe (6)  
(iii) Hash Table. (6)
14. (a) (i) Explain the Round-Robin with interrupt architecture with an example. (8)  
(ii) Explain how real time operation system architecture differ with other software architectures. (8)  
Or
- (b) What is a shared data problem? Explain how shared data problem will be handled in real time system.
15. (a) Explain the benefits of using Vx Works for the development of Embedded system with appropriate diagrams.  
Or
- (b) (i) Explain how to divide the work into RTOS tasks with suitable example. (8)  
(ii) Discuss how Embedded System is used in the modern automobiles. (8)