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**Question Paper Code : 91360**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2014.

Sixth Semester

Electronics and Instrumentation Engineering

CS 2364/EI 64/10133 EE 703/10144 CSE 26 – EMBEDDED SYSTEMS

(Common to Instrumentation and Control Engineering)

(Regulation 2008/2010)

(Common to PTCS 2364 – Embedded Systems for B.E. (Part – Time) Sixth Semester  
– Electronics and Instrumentation Engineering – Regulation 2009)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. How embedded system are different from conventional PC?
2. What are the different types of memory used in embedded system design?
3. Why device drivers are necessary for interfacing a device with processor?
4. List the major features USB bus.
5. What are the advantages and disadvantages of maskable and non-maskable interrupts?
6. What is context switching? What are the advantages of context switching?
7. Compare the difference between RTOS and operating system.
8. List any four commercial RTOS.
9. Compare CISC and RISC Architectures? Give an example for each architecture.
10. List any four embedded applications where PIC microcontroller is used as major hardware part.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the memory management concepts in embedded system design. (8)
- (ii) How real time systems differ from conventional system? What is the necessity of real time system in embedded applications? (8)

Or

- (b) (i) With a block diagram explain the embedded system design process. (8)
- (ii) Explain the significance of EEPROM and SRAM in an embedded system. (8)
12. (a) (i) Draw the CAN data frame format and explain the bus arbitration process in CAN protocol. (8)
- (ii) Why PCI/X buses are widely used for high speed data transfer? List the major features of PCI/X buses. (8)

Or

- (b) (i) Compare the features of timers and counters. List any four embedded applications which uses timers. (8)
- (ii) How to transfer a byte of data using I<sup>2</sup>C protocol? (8)
13. (a) (i) What is shared data problem? How to prevent shared data problem? Explain it with an example. (8)
- (ii) Give an example to justify the necessity of preemptive multitasking and non-preemptive multitasking in an embedded system. (8)

Or

- (b) (i) What is interrupt latency? How to prevent interrupt overrun and disable interrupt? (8)
- (ii) Explain multithreaded programming with an example. (8)
14. (a) (i) List the major features of UNIX based RTOS. (8)
- (ii) How interrupt handling is achieved in RTOS. (8)

Or

- (b) (i) List the major features of windows RTOS. (8)
- (ii) What is the significance of benchmarking real time systems? How Vx works is different from  $\mu\text{C}/\text{os} - \text{II}$ . (8)

15. (a) Draw the functional block diagram of PIC microcontroller and explain the function of each block. (16)

Or

- (b) (i) How to generate a PWM using PIC microcontroller? Explain it with an example. (8)
- (ii) How to interface a matrix keyboard and LEDs with PIC microcontroller? Draw the schematic for the same. (8)
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