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Question Paper Code : 41247

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

Seventh Semester

Electrical and Electronics Engineering

080280071 — EMBEDDED SYSTEMS

(Common to B.E. (Part-Time), Sixth Semester, Electrical and Electronics Engineering)

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Why is power consumption important in embedded systems?
2. What is the role of RAM in an embedded system?
3. Compare : CISC and RISC architecture.
4. What is Fragmentation?
5. What are the features of USB protocol?
6. Write the features of I²C.
7. What are the OS units at an RTOS kernel?
8. Differentiate between process and thread.
9. Compare : OS and RTOS.
10. Define Emulator.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Define embedded systems and give their classification. (6)
(ii) Explain the different program layers in embedded software with a suitable block diagram. (10)

Or

- (b) List and explain the basic hardware and software required to develop the embedded application.
12. (a) What are the built-in components available on typical modern microprocessor? How does each component help to develop a real time embedded application? Explain.

Or

- (b) (i) In what kind of memory would you store each of the following? Justify your answer. (12)
- (1) A user-configurable name for a printer attached to a network that the printer should remember even if the power fails.
 - (2) The data that your program just received from the network.
 - (3) The program for an intelligent VCR of which your company hopes to sell ten million units.
 - (4) The programs for a beta version of an x-ray machine that your company is about to ship to several hospitals on an experimental basis.
- (ii) What are the different types of memory inside embedded systems? Where are they used for? (4)
13. (a) (i) Explain three modes of serial communication, 'synchronous', 'iso-synchronous' and 'asynchronous' from the serial devices with one example each. (9)
(ii) Describe the CAN bus with its frame formats. (7)

Or

- (b) (i) Explain the following parallel communication devices :
- (1) ISA bus
 - (2) PCI and PCI/X (8)
- (ii) How do you write device driver? List the steps involved in writing a device driver. (8)

14. (a) (i) How are interrupts different from polling? Under what conditions polling is better than interrupts. (9)
- (ii) Define : Interrupt overrun. How to prevent interrupt overrun? (7)

Or

- (b) (i) Draw and Explain: Thread state diagram for Preemptive and non-preemptive kernel. (8)
- (ii) Explain the Procedure for writing interrupt service routine in C. (8)
15. (a) (i) Explain : RTOS task and task state. (8)
- (ii) How does the interrupt work in RTOS environment? Explain. (8)

Or

- (b) (i) Write the action plan to follow while designing an embedded system. (9)
- (ii) What is a target system? How does the target system differ from the final embedded system? (7)
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