C 3270

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2007.

Sixth Semester

Information Technology

IT 1353 — EMBEDDED SYSTEMS

(Common to Computer Science and Engineering)

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define system on chip (SOC) with an example.

2. Give any two uses of VLSI designed circuits.

3. Expand and explain HDLC.

4. What are the characteristics of PCI bus?

5. Why do you need a cross compiler?

6. What are the advantages of building ISR queues?

7. Explain the objectives of a Kernel.

8. What are the uses of semaphores?

9. What is the meaning of Task Service functions?

10. What are the queue related functions?

PART B — (5 × 16 = 80 marks)

11. (a) (i) Explain the various forms of memories present in a system. (8)

   (ii) List the hardware units that must be present in the embedded systems. (8)

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Or

(b) (i) Explain the different program layers in the embedded software and also the process of converting a "C" program into the file for ROM image with suitable block diagrams. (8)

(ii) Give a brief note on Exemplary Applications of each type of Embedded system. (8)

12. (a) (i) What are the characteristics taken into consideration when interfacing a device and a port? (8)

(ii) What are the Sophisticated Interfacing features in Device Ports? (8)

Or

(b) (i) Tabulate uses of Timer device with applications and explanations. (8)

(ii) Explain the signals during a transfer of a byte when using the $I^2C$ bus and also the format of the bits at the $I^2C$ bus with diagrams. (8)

13. (a) (i) Tabulate program elements : Macros and functions and their uses. (8)

(ii) Explain the use of pointers, NULL pointers. (8)

Or

(b) (i) What are the advantages of using multiple function calls in cyclic order in the main? Also write the advantages of building ISR queues? (4 + 4)

(ii) What are the programming advantages of C++? What are the disadvantages of C++? (4 + 4)

14. (a) (i) List the goals of operating system services. (8)

(ii) Explain three alternative systems in three RTOSs for responding to a hardware source call with diagrams. (8)

Or

(b) (i) What are the 15 points strategy must be taken into account for designing the codes for synchronization between the processes, ISRs, OS functions and tasks and for resource management? (8)

(ii) Explain a scheduler in which the RTOS inserts into a list the ready tasks for sequential execution in a cooperative round robin model. (8)

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Device Ports? (8)

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15. (a) Draw and explain basic system (ACVS) of an Automatic Chocolate Vending Machine. (16)

Or

(b) Discuss with a diagram Task synchronization model for a specific application. (16)