

Name :

Roll No. :

Invigilator's Signature :

CS/B.Tech(EIE)/SEM-8/EC-802B/2012

2012

EMBEDDED SYSTEM

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

*Candidates are required to give their answers in their own words
as far as practicable.*

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following :

10 × 1 = 10

i) Which chip has a large number of arrays with each element having fusible links ?

- a) GPP
- b) ASSP
- c) FPGA
- d) Register.



- ii) The main function of RTOS is
- a) Real time task scheduling and interrupt latency control
 - b) Device management
 - c) Process management
 - d) Memory management.
- iii) Which one of the following is used as an additional processing unit for running the application specific tasks in place of processing using embedded software ?
- a) Micro-controller
 - b) DSP
 - c) FPGA
 - d) ASSP.
- iv) Which of the following has the highest "storage performance" ?
- a) DRAM
 - b) SRAM
 - c) OTP ROM
 - d) Masked ROM.



v) Which of the following are commercially claimed RTOSs ?

- a) Linus
- b) Windows CE
- c) Windows NT
- d) Sun Solaris.

vi) Which of the following scheduling algorithms checks the rate of occurrence of the task ?

- a) DMA
- b) EDF
- c) Co-operative
- d) All of these.

vii) Which is the heart of an embedded system ?

- a) Interrupt controller
- b) Processor
- c) I/O devices
- d) Power supply.

viii) A model in which there are finite states, which have given assets of inputs, or state changes according to the state transition function is

- a) FSM
- b) ADFG
- c) DFG
- d) UML.



GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following.

3 × 5 = 15

2. Compare RISC and CISC architectures.
3. Describe the Moore's law in embedded systems.
4. Compare Von-Neumann and Harvard architectures of a processor based system.
5. How does a microprocessor differ from a micro-controller ?
6. Describe the different types of memories used in an embedded system.

GROUP - C

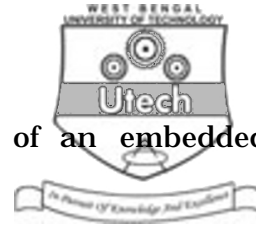
(Long Answer Type Questions)

Answer any *three* of the following.

3 × 15 = 45

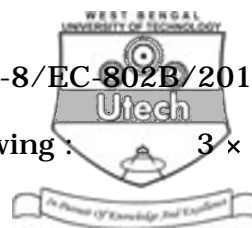
7.
 - a) Define RTOS.
 - b) What are different utilities in mail box, pipe and queue in RTOS ?
 - c) What is shared data problem ? Briefly discuss the solution to overcome this problem.
 - d) What is priority inversion problem ?
 - e) Describe in brief the structure of RTOS.

1 + 4 + 5 + 2 + 3



8. a) Describe the different components of an embedded system.
- b) What are the specific features of an embedded system processor ?
- c) How will you classify an embedded system ? 5 + 5 + 5
9. a) What is virtual memory ? What could be the maximum size of virtual memory ? Justify.
- b) What is parallel processing ?
- c) What is flash memory ?
- d) What is vector processing ?
- e) What is the function of 'BUS' in computer architecture ?
- 4 + 3 + 2 + 2 + 4
10. a) Highlight the major issues of Pipe-lining related to processor design trade-offs between CISC and RISC based on the dynamic usage statistics of instructions on a functional classification in a typical application program.
- b) CISC processors have better code density than the RISC processors. Explain in a bit detail with reasons.

10 + 5



11. Write short notes on any *three* of the following : 3×5

- a) Synchronous mode of data transfer
- b) Designing memory interfacing
- c) Designing I/O ports
- d) PLD
- e) FPGA
- f) Device driver
- g) System on chip (SOC) design.

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