



Name :

Roll No. :

Invigilator's Signature :

CS/B.TECH(ECE)/SEP.SUPPLE/SEM-8/EC-803B/2012

2012

EMBEDDED SYSTEMS

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 of the following processor architectures supports easier instruction pipelining ?
 - a) Harvard
 - b) Von Neumann
 - c) Both (a) and (b)
 - d) None of them.
- ii) Which of the following is one time programmable memory ?
 - a) SRAM
 - b) PROM
 - c) FLASH
 - d) NVRAM.



- iii) How many memory cells are present in 1 kb RAM ?
- a) 1024 b) 8192
- c) 512 d) 4096.
- iv) What is the minimum number of interface lines required for implementing I2C ?
- a) 1 b) 2
- c) 3 d) 4.
- v) Which of the following is/are synchronous serial interface ?
- a) I2C b) SPI
- c) UART d) Only (a) and (b).
- vi) Name the register holding the address of the memory location for the next instruction to fetch.
- a) DPTR b) PC
- c) SP d) None of these.
- vii) Name the register holding the address of external data memory to be accessed in 16 bit external data memory operation.
- a) DPTR b) PC
- c) SP d) None of these.



xiii) The number of logic gates present in IC is 500. The integration type of IC is

- a) MSI
- b) LSI
- c) SSI
- d) VLSI.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. What are the advantages of DMA based data transfer over the interrupt driven data transfer ?
3. Briefly explain salient features of an embedded system with (a) Harwired control and (b) Micro-program control.
4. Design an EX-OR gate using FPGA and LUT.
5. What is an Embedded System ? State the applications of embedded system.
6. What do you mean by the memory hierarchy in an embedded system ?
7. Calculate the 4-point DFT of the sequence : $x[n] = \{0 \ 1 \ 0 \ 1\}$ and also find the IDFT of the obtained result.
8. With neat block diagram explain Successive Approximation method.

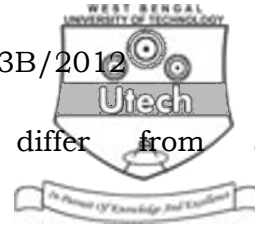


GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

9. a) Describe the efficiency measuring parameters of an embedded system.
- b) Describe the different components of an embedded system.
- c) Describe the design methodology of an embedded system.
- d) Describe the different types of microphones are used in an embedded system. $2 + 4 + 4 + 5$
10. a) What are the different utilities in mail box, pipe and queue in RTOS ?
- b) What are the different management techniques is adopted and why in real time OS ?
- c) What are the different interrupt rules in real time system ? $5 + 5 + 5$



11. a) How does a microprocessor differ from a microcontroller ?

b) What are the specific features of an embedded system processor ?

c) Compare RISC and CISC architectures.

d) Now-a-days high performance embedded systems use either an RISC processor or a processor with an RISC core with a code-optimized CISC instruction set.

Explain.

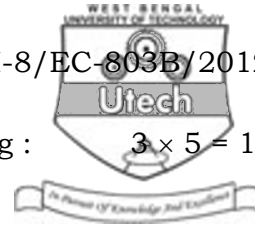
2 + 4 + 6 + 3

12. Describe the characteristics of an embedded system. What do you mean by soft real time and hard real time systems ? Give the differences between embedded system and general purpose computer system.

5 + 5 + 5

13. Give the difference between SIMD, MIMD and VLIW architectures. Explain the different computational models in embedded system design.

5 + 10



14. Write short notes on any *three* the following :

3 × 5 = 15

- a) Device Driver
- b) IEEE Single Precision Floating Point Format
- c) System on Chip (SoC) Design
- d) Integrated Development Environment (IDE)
- e) Boot Loader
- f) RTOS for Mobile Communication.

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