B.Tech. – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING (BTECVI)

00126

Term-End Examination

June, 2015

BIEL-024 : EMBEDDED SYSTEMS DESIGN

Time : 3 hours   *Maximum Marks : 70*

Note : First question is compulsory and attempt any four from the rest. All questions carry equal marks. Use of scientific calculator is permitted.

1. (a) Choose the correct answer for the following questions :   7×2=14

   An embedded system has RAM memory

   (i) for storing the variables during program run, as stack and as input or output buffers

   (ii) for storing all the instructions and data

   (iii) for storing the programs from external secondary memory

   (iv) for fetching instructions and data into cache(s)

(b) Scheduling of tasks is a very important consideration in RTOS. Which of the following best describes the scheduling policy design ?

(i) The scheduler must follow a pre-emptive policy.

(ii) The scheduler must not use pre-emptive policy option.

(iii) The scheduler must use pre-emptive policy option with the priority considerations.

(iv) The scheduler must not use pre-emptive policy option, but must employ priority considerations.

(c) Keeping a task's schedulability in mind, in which way may a task be scheduled ?

(i) The task has a predetermined time after which it may be scheduled.

(ii) The task has a predetermined time before which it may be scheduled.

(iii) The task has a predetermined time interval during which it must be scheduled any time.

(iv) The task start has a worst case delay estimate before which it must be scheduled.

(d) Which of the following instructions perform jump indirect relative to DPTR ?

    (i) JMP A + DPTR

    (ii) JMP DPTR

    (iii) JMP @A + DPTR

    (iv) SJMP A + DPTR

(e) In 8051, which interrupt has highest priority ?

    (i) IE 1

    (ii) TF 0

    (iii) IE 0

    (iv) TF 1

(f) Sixteen-segment LCD display shows diagonal segments only. The displayed character will be

    (i) X

    (ii) M or V

    (iii) Ẏ

    (iv) X or V

(g) For compiling source codes for another processor and vice versa, it requires a

    (i) Compiler

    (ii) Editor and Compiler for target processer

    (iii) Cross compiler

    (iv) Prototyper

2. (a) Define "System" and an "Embedded system".

   (b) Explain the components of an embedded system hardware.

   (c) Give the classification of embedded systems. *4+6+4=14*

3. (a) Describe the different types of data in RTOS-based Real Time system with their characteristics.

   (b) Explain the interrupt routines in RTOS environment. *7+7=14*

4. (a) Explain about IE and IP function registers relevant to 8051 microcontroller interrupts.

   (b) Discuss about external interrupts and software generated interrupts in 8051 microcontroller. *7+7=14*

5. (a) What are the 16-bit data addressing registers of the 8051 microcontroller ? Explain their functions.

   (b) Explain the architecture of AVR 8515 microcontroller. *7+7=14*

6. (a) Differentiate between assembler, compiler, cross compiler, and Integrated Development Environment (IDE).

(b) Differentiate between ADC and DAC. Also state their types.

(c) With the help of suitable diagram, explain the interfacing of seven-segment LED to 8051 microcontroller. *5+5+4=14*

7. Write short notes on any *two* of the following : *7+7=14*

(a) Bluetooth

(b) JTAG

(c) Ethernet

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