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BIEL-024

B.Tech. – VIEP – ELECTRONICS AND COMMUNICATION ENGINEERING

(BTECVI)

00700

Term-End Examination

December, 2014

BIEL-024 : EMBEDDED SYSTEMS DESIGN

Time : 3 hours *Maximum Marks : 70*

Note : *Question no. 1 is* ***compulsory*** *and attempt any* ***four*** *from the rest. All questions carry equal marks. Use of scientific calculator is permitted.*

1. (a) Explain the following :

(i) LDA 2000H

(ii) MOV BX, CX

(iii) MOV A, # 02

(iv) INC R0

(b) Differentiate between Microprocessor and Microcontroller.

(c) How is instruction cycle executed ? Explain in brief.

(d) Which of the following converters has an analog input ?

(i) DAC

(ii) ADC

(iii) Op-Amp

(iv) None of the above

(e) What is pipelining architecture ?

(f) Differentiate between compiler and interpreter.

(g) Define the term Integrated Development Environment (IDE) as applicable to Embedded System Development. *7×2=14*

2. (a) What is the role of processor selection in Embedded System Design ? *5*

(b) What are the softwares/tools used for development of an ES ? *5*

(c) What are the advantages/disadvantages of memory-mapped I/O over I/O-mapped I/O ? *4*

3. (a) What is RTOS and where is it used ? Explain with suitable example. *4*

(b) What are the types of interrupt routines in RTOS environment ? Explain. *5*

(c) Draw the basic architecture of RTOS and explain its functionalities such as timer function, events and memory management. *5*

4. (a) Design the interface for an 8-bit DAC to the 8051 Microcontroller. Take any popular DAC chip of your choice. *5*

(b) Draw the architecture of 8051 Microcontroller and briefly explain the various blocks of it. *5*

(c) How many interrupt sources are there in 8051 Microcontroller ? Explain each of them. *4*

5. (a) Explain the memory mapping of the 8051 Microcontroller by drawing its suitable diagram. *5*

(b) Briefly explain the instruction set of 8051 Microcontroller. *5*

(c) Draw the port 0 configuration of 8051 Microcontroller and briefly explain its operation. *4*

6. (a) Draw and explain the I2C Bus architecture. *5*

(b) Define the following of a DAC : *5*

(i) Resolution

(ii) Accuracy

(iii) Linearity

(iv) Settling time

(v) Monotonicity

(c) Differentiate between ADC and DAC as per its operational mechanism. *4*

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

(i) PIC microcontroller

(ii) Ethernet

(iii) Bluetooth

(iv) Testability