

8E4094

Roll No. _____

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B. Tech. VIII Sem. (Main/Back) Exam., April, 2015

Electronics & Communication

8EC4.3 Microcontroller & Embedded Systems

Time: 3 Hours

Maximum Marks: 80

Min. Passing Marks: 24

Instructions to Candidates:

Attempt any **five questions**, selecting **one question** from **each unit**. All questions carry **equal marks**. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
(Mentioned in form No. 205)

1. NIL

2. NIL

UNIT – I

- Q.1 (a) Write the basic characteristics for a CPU to be classified as a microcontroller. [4]
(b) What is PSW register? Explain the function of individual bits of the PSW register. [6]
(c) What are the alternate functions of the pins of port 3 of 8051 microcontroller? [6]

OR

- Q.1 (a) Explain why microcontroller is suitable for design and development of embedded systems. [4]
(b) Explain the RAM structure of 8051 microcontroller. [6]
(c) What are different register banks available in 8051 microcontroller? What is the default register bank and how do you switch between different register banks. [6]

UNIT – II

- Q.2 (a) What is the use of following directives in 8051:- [6]
- (i) ORG,
 - (ii) EQU,
 - (iii) END,
 - (iv) DB
- (b) Why 8051 is called a Boolean Processor? What is the difference between RET and RETI instruction? [4]
- (c) Write a program in 8051 assembly language to add the first ten natural numbers. [6]

OR

- Q.2 (a) What is the difference between LJMP and SJMP instructions, LCALL and ACALL instructions? [4]
- (b) Write a program to - [6]
- (i) Load the accumulator with the value 55H, and
 - (ii) Complement the accumulator 500 times.
- (c) Write a program to determine if the content of RO is FFH. If so, move FFH to R5. [6]

UNIT – III

- Q.3 (a) How many interrupts are there in 8051? What is the default priority of the interrupts? [4]
- (b) Write the function of the individual bits of the TMOD register. [6]
- (c) With a frequency of 22 MHz, generate a frequency of 100 KHz on pin 2.3. Use timer 1 in mode 1. [6]

OR

- Q.3 (a) What is the use of GATE bit of TMOD register? What is the software method for starting and stopping the timer system of 8051? [6]
- (b) Write the function of the individual bits of the IE register. [6]
- (c) What is the counter system of 8051? Write one application where the counter system may be used. [4]

UNIT – IV

- Q.4 (a) Draw the schematic and explain the method of interfacing a matrix keyboard with 8051 microcontroller. [8]
- (b) What is the difference between interrupt driven input/output and polling method of input/output? Which method is preferable? [4]
- (c) Write the function of TI and RI flag of SCON register. [4]

OR

- Q.4 (a) Draw the schematic and explain the method of interfacing a LCD display with 8051 microcontroller. [8]
- (b) Draw the schematic and explain the method of interfacing an A/D converter with 8051. [8]

UNIT – V

- Q.5 (a) What are the various scheduling techniques used in operating systems? Explain any two. [8]
- (b) What do you understand by multitasking in operating systems? How is it achieved? [8]

OR

- Q.5 (a) List three ways in which an RTOS handles the ISRs in an multitasking environment. [8]
- (b) What is unique feature of Linux device drivers? How does Linux schedule the tasks? Why is this feature highly useful in an embedded system? [8]
