

Reg. No. :

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**C 3403**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2008.

Sixth Semester

Mechatronics Engineering

MH 1352 – MICRO CONTROLLER AND PLC

(Regulation 2004)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. What will be the content of SP when 8051 in reset?
2. What is the function of RST/VPD signals?
3. What is the function of RB8 bit in SCON?
4. When will the interrupt flag takes a value 1 in Mode 2 operation of timer.
5. In a 4×4 matrix keyboard if  $D_3 - D_0 = 1011$  for the row and  $D_3 - D_0 = 101$  for the column, identify the key pressed.
6. If the supply voltage = 5 v and number of steps is 4096, determine the resolution of ADC.
7. What are the functions of optical isolator circuit used in I/O modules?
8. What is meant by non retentive timers?
9. What is a scan in PLC?
10. Draw the ladder diagram of a on-delay timer program that uses the EQUAL to instruction.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe the architecture of 8051. (11)  
 (ii) Write a program to find the factorial of a given number when INTO is invoked. (5)

Or

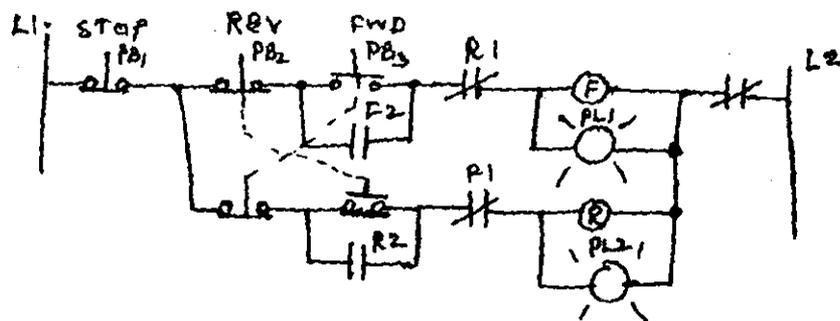
- (b) (i) Write a program a transfer 10 bytes of data from the RAM location 40 H to the RAM space 250 H. (6)  
 (ii) Explain the addressing modes in 8051 with suitable examples. (10)
12. (a) With suitable example explain the steps involved in the design of a system based on the microcontroller.

Or

- (b) (i) Write a program to transfer the message "How are you" serially at 4800 baud using mode 1. (6)  
 (ii) Write a program to receive the data serially from port 2.1 and transmit the received data serially to a PC COM port. (10)
13. (a) Draw the hardware circuit to interface 0809 to 8051. Support the interface with program.

Or

- (b) With proper hardware and software circuit explain how LCD is interfaced with LCD.
14. (a) (i) Explain about the Hardware components of PLC.  
 (ii) Design a PLC program, I/O connection diagram and logic ladder program that will correctly execute the hard wired control circuit shown below.



Or

- (b) (i) Explain about Analog I/O modules and proximity switches.
- (ii) Design a PLC program , I/O connection diagram and logic diagram for the following motor control specification.
  - (1) Three starters are to be wired so that each starter is operated from its own START/ STOP Push – button station.
  - (2) A master STOP station is to be included that will trip out all straters when pushed.
  - (3) Overload relay contacts are to be programmed so that an overload on any one of the starters will automatically drop all of the starters.
  - (4) All bush buttons are to be wired using one set of NO contacts.

15. (a) Discuss any two applications of PLC in detail.

Or

- (b) (i) Describe how timers and counters are implemented in PLC.
- (ii) Explain the application of PLC in a process control environment.