



MANIPAL INSTITUTE OF TECHNOLOGY

Manipal University

FOURTH SEMESTER B.TECH (E & C) DEGREE END**SEMESTER EXAMINATION - APRIL / MAY 2017****SUBJECT: MICROCONTROLLERS AND APPLICATIONS (ECE - 3284)****TIME: 3 HOURS****MAX. MARKS: 50****Instructions to candidates**

- Answer **ALL** questions.
- Missing data may be suitably assumed.

- 1A. Discuss all the addressing modes available in 8051 with suitable example
- 1B. Describe the function of following 8051 pins:
 i) ALE ii) RST iii) RXD
- 1C. What is the default order of interrupt priority in 8051? Explain How it can be changed
 (5+3+2)
- 2A. Draw the programming model of 8051 and explain all the register sets available in 8051 microcontroller.
- 2B. Discuss the function of each bit in SCON register. Also explain the operating modes of serial ports of 8051.
- 2C. A pulse stream input is connected to T1 pin. Program counter1 in mode 2 and toggle port 0 pins when overflow occurs.
 (5+3+2)
- 3A. Write a program to generate a saw tooth wave time period 10msec and maximum peak voltage = 8V
- 3B. With neat diagram, explain working of 8051 based automatic water level indicator system.
- 3C. Show the instructions for the following interrupt control
 i) Enable Timer 0 overflow and timer1 overflow interrupts
 ii) Disable all external interrupts
 iii) Enable serial interrupts
 (5+3+2)
- 4A. Write a program to display "8051" continuously on seven segment displays
- 4B. Assume that Timer1 is operating in mode1 .It is required to schedule a new task after 0.05 seconds. If the timer oscillator operated at 10MHz, how the timer registers should be configured for this operation.
- 4C. Differentiate between Von Neumann architecture and Harvard architecture.
 (5+3+2)

- 5A. Interface Stepper motor to 8051 microcontroller. Write a program to rotate stepper motor continuously.
- 5B. Assume that INT1 pin is connected to a switch that is normally high. Whenever it goes low, it should turn on an LED. The LED is connected to P1.3 and is normally off. When it is turned on it should stay on for a fraction of a second. As long as the switch is pressed low, the LED should stay on
- 5C. A washing machine is designed for a voltage range of 150V-250V. If the voltage is above 250V or below 150V, the washing machine will shut down by turning off a relay connected to P1.0. Assume that the voltage can be read at port 0 in the range 0-255V. Write a program to implement this operation.

(5+3+2)