Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

A Constituent Institution of Manipal University

SEVENTH SEMESTER B.TECH. (E & C) DEGREE END SEMESTER EXAMINATION
NOVEMBER 2018
SUBJECT: ADVANCED PROCESSORS AND CONTROLLERS (ECE - 4018)

TIME: 3 HOURS **MAX. MARKS: 50**

Instructions to candidates

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

1A. Describe an architecture of an AVR microcontroller with neat block diagram

1B. Draw the clock distribution for an AVR microcontroller. Explain the different clock sources

(5+5)

2A. Explain the following with respect to AVR microcontroller:

a) status register b) PC c) data memory d) program memory d) stack operation

2B. Assume that 10 bytes are stored in a data memory. Write an assembly language program to search for a number in the array. If the number is present, count the number of times it is present and display the count in port A. If the number is absent then display 'N' in port A.

(5+5)

3A. List the different types of assembler directives used in AVR programming. Write an assembly code to display a BCD counter on a seven segment display connected to PORT A of AVR microcontroller.

3B. Explain the interrupt operation. Assume that INT0 pin is connected to a switch that is normally high. Write an assembly language program that toggles PORTC.3 whenever there is a rising edge signal at INT0 pin.

(5+5)

4A. Write a C program for AVR microcontroller to toggle only PORTA.0 continuously with 1 second delay. Use timer 1 in normal mode and 1:256 pre-scaler to create a delay. Assume XTAL=8MHz.

4B. Write a single assembly language program for AVR microcontroller to perform the following:

i) Transmit message "MIT" serially once.
ii) Receive a byte serially and display it on PORTA.
iii) Read PORTB and transmit data serially.

(5+5)

5A. Draw the general architecture of a PSoC. Explain the Analog and Digital system of PSoC in detail

5B. List the drive modes supported by digital IO of PSoC.

5C. Explain the address space supported by PSoC. (4+3+3)