Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

V SEMESTER B.TECH. (MECHATRONICS ENGINEERING)
END SEMESTER EXAMINATIONS, NOVEMBER 2018

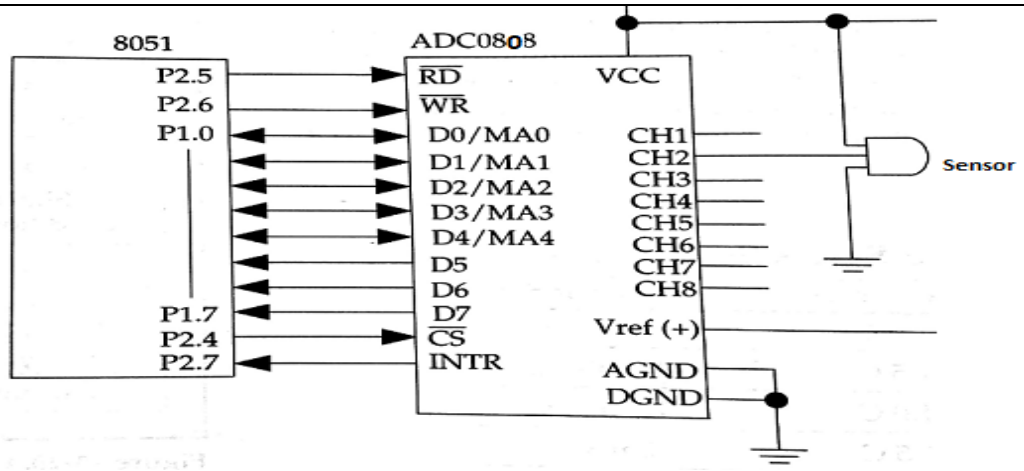
SUBJECT: MICROCONTROLLER BASED SYSTEM DESIGN [MTE 3103]

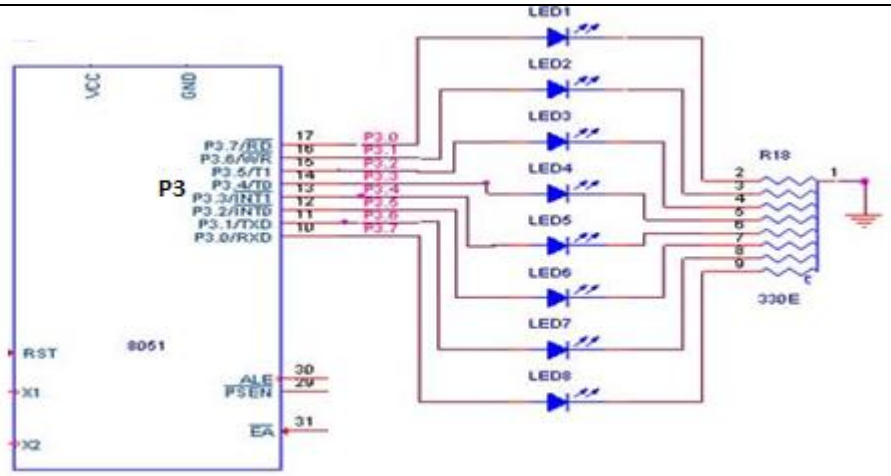
(1../11/2018)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Data not provided may be suitably assumed
- **ALP** refers to *Assembly Language Program*

1A	Generate a square wave of 1 KHz frequency on P1. 3 of 8051 using Mode 1 of Timer 0 using ALP. Assume XTAL = 22 MHz	**04**
1B	In an 8051 microcontroller based a pressure monitoring system, an analog pressure sensor is connected to 8051 as in **Fig Q1B.(a)**, and is calibrated for the following: - Resolution 1V/2bar and rated for 0 to 6bar Range. Create an ALP to display the reading in an LED driver circuit as connected in **Fig Q1B.(b)**	**06**
	 **Fig 1B.a**	

	 **Fig Q1B.b**	
2A	The interrupt priority register is set with the instruction MOV IP**,#00001101B**. Deduct the sequence in which the interrupts are serviced. Consider initial condition to be reset.	**03**
2B	Summarize the different addressing modes of 8051 micro controller with suitable example.	**05**

2C.	Show the status of CY, AC and P flags after execution of the following
	MOV A, #9CH
	ADD A, #64H
		02

3A.	Highlight the significance of subroutines in ALP? Show the effects of subroutine execution on stack with proper example.	**03**
3B	Explain Interrupt Service Routine and functional parts of it.	**02**
3C.	Generate a periodic ramp wave of magnitude 5 V on Port 1 of 8051 by applying embedded C program. Assume XTAL = 11.0592 MHz	**05**
4A.	Outline the complete architecture of 8051 micro controller with a neat block diagram and explanation.	**05**
4B.	Summarize the functions of TCON register with bits details in timers and counters.	**02**
4C.	Develop an 8051 Embedded C program to calculate the product of two digit BCD numbers.	**03**
5A	Write a program for 8051 to toggle all the bits of port 0 and port 2 taking a delay of 250ms through embedded C. Make use of sfr keywords to declare the port address. Consider XTAL = 11.0592 MHz	**05**
5B	In an 8051 based inventory management system, an ALP is to be developed to display the product list based on number of quantities available in ascending order from 60 H onwards. The available quantities of about 10 products are stored in location 40 H onwards.	**05**