MANIPAL INSTITUTE OF TECHNOLOGY
Manipal University

**FOURTH SEMESTER B.Tech. (E & C) DEGREE END SEMESTER EXAMINATION
MAY/JUNE 2016
SUBJECT: MICROPROCESSOR AND MICROCONTROLLER (ECE - 204)**

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

Instructions to candidates
- Answer any **FIVE FuLL** questions.
- Missing data may be suitably assumed.

1A. With a neat diagram, explain the architecture of 8086 microprocessor along with function of each block and registers

1B. Write 8086 assembly instruction which will perform the following operations:
   i) Multiply AL times BL.
   ii) Divide the AL register contents by 2 using a shift instruction.
   iii) Multiply the AL register contents by 4 using shift instruction.

1C. Describe the difference between the instructions MOV AX, 2347H and MOV AX, [2347H]

(5+3+2)

2A. Interface 64KB of RAM using 16KB memory chips using 3:8 decoder with the starting address 8000h. Clearly mention the memory map and decoding logic.

2B. With relevant example, describe the physical address formation in 8086.

2C. What is the advantage of time multiplexing the address/data bus?

(5+3+2)

3A. Write an ALP using 8086 instructions to generate and add the first 10 even numbers and save the numbers and result in memory location Num and Sum

3B. Explain interrupt vector table in brief.

3C. Differentiate between Assembler and Linker.

(5+3+2)

4A. With neat architectural block diagram, explain the functions of each block and registers.

4B. Distinguish between microprocessors and microcontrollers.

4C. Describe the concept of memory banking and state their uses.

(5+3+2)

5A. Discuss the various timer modes supported by 8051. What is special about the auto-reload mode?

5B. Briefly describe the control word format of 8255 in I/O mode and BSR mode.

5C. How do you double the baud rate in 8051 serial communication? Explain in detail.

(5+3+2)

6A. Write an interrupt program for 8051 to do following continuously:

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i) Generate a square wave of 33% duty cycle on P1.0.

ii) Read a byte from P0 and transmit serially at 4800 baud.

iii) Receive a byte serially and give a copy of it to P2.

Assume that crystal frequency is 11.0592 MHz

6B. Suppose an 8051 is operating under the control of an external crystal oscillator running at 16MHz, how much time does it take to execute the following instructions?

i). MUL AB   ii). ANL 10h, #54   iii). MOVX A, @R0

6C. Explain the function of each bit in TCON register.

(5+3+2)