Reg. No.										

प्रज्ञानं ब्रह्म

Manipal
INSPIRED BY LIFE

MANIPAL INSTITUTE OF TECHNOLOGY, MANIPAL 576104

(Constituent College of Manipal University)

FOURTH SEMESTER B.TECH. (IT) DEGREE END SEMESTER EXAMINATION, MAY – 2016
SUBJECT: COMPUTER ORGANIZATION AND MICROPROCESSOR SYSTMS – ICT 204
(REVISED CREDIT SYSTEM)

TIME: 3 HOURS **07/05 /2016** **MAX. MARKS: 50**

Instructions to candidates
- Answer **ALL** questions.
- Missing data, if any, may be suitably assumed.

1A. Explain the working of 8254 software programmable timer/counter IC programmed to operate in mode 0 and mode 1 with appropriate timing diagrams.

1B. Draw the flow chart showing mechanics of a 3 x 3 two's compliment sequential Booth's multiplier and perform multiplication of multiplicand $(2)_{10}$ with the multiplier $(-3)_{10}$.

1C. Write a macro to set the cursor position at given x and y coordinates using BIOS interrupt function.

[5+3+2]

2A. Explain the following instructions of 8086 microprocessor with one example for each

i. POP DS
ii. SAHF
iii. AAD
iv. SAR
v. LOOPZ

2B. What is DMA? Discuss different types of DMA used in data transfer between the I/O device and a computer.

2C. Explain the functionality of the following pins with respect to 8086 microprocessors.

i. RESET ii. $\overline{\text{TEST}}$ [5+3+2]

3A. Explain the following addressing modes of 8086 microprocessor with relevant example

i. Immediate addressing mode
ii. Register addressing mode
iii. Direct memory addressing mode
iv. Fixed port addressing mode
v. Variable port addressing mode

3B. Write an assembly language program to generate a 20 kHz continuous square wave signal using counter 2 of 8254 software programmable timer/counter IC.

3C. Explain the following 8086 instructions with suitable example

i. LODSB ii. CMPSB [5+3+2]

4A. Discuss the control word format for 8255 PPI and write the control word to initialize 8255 for following specifications

i. Port A is output port in mode 2.
ii. Port C (upper) is input port
iii. Port B is output port in mode 1.
iv. Port C (lower) is input port

4B. With neat diagrams, exemplify paging and segmentation methods of configuring virtual memory systems.

4C. Draw the hardware implementation using register with enable input to perform the following

if x = 0, and t = 1 then A ← B

else A ← D.

where A, B and D are 4 bits and x, t are 1 bit control signals [5+3+2]

5A. Write 8086 assembly language program to down count from N_2 to N_1 in decimal. (Assume $N_2 > N_1$). Make use of procedural calls appropriately.

5B. Using non restoring method, perform the division of $(24)_{10}$ by $(7)_{10}$. Show all iterative steps involved.

5C. Draw the block diagram of general purpose register that performs the following operations on a three bit input $X_2\ X_1\ X_0$.

S_1	S_0	OPERATIONS
0	0	No Operations
0	1	Shift Left
1	0	Shift Right
1	1	parallel

[5+3+2]

6A. Draw the block diagram of execution unit of 8086 and explain functionality of each block.

6B. Give the pros and cons of two bus RALU with respect to single bus RALU.

6C. Write short note on assembler directives. [5+3+2]

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