313305

12526

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answer with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following: **10**

a) Draw the symbol, truth table and logic equation of the EX-NOR gate.

b) Define and draw the logical symbol of a demultiplexer.

c) List one application of each of following :–

i) Graycode

ii) ASCII code.

d) Describe the function of any two assembler directives in 8086 with suitable examples.

e) State the function of AAA and STC instruction of 8086 microprocessor.

Marks

f) Write use of Index registers, base pointer and instruction pointer.

g) State the function of following pins of 8086 microprocessor.

i) ALE

ii) DT/$\overline{R}$

iii) M/$\overline{Io}$

iv) HOLD.

2. Attempt any <u>THREE</u> of the following: **12**

a) Perform the following subtraction using 1's compliment and 2's compliment $(1\ 0\ 1\ 0\ 0\ 1\ 0\ 1)_2 - (1\ 1\ 1\ 0\ 1\ 1\ 1\ 0)_2$.

b) Design half substractor using logic gate write truth table.

c) Analyse the content of AL register and status of carry and auxilliary flag after the execution of each instruction :–

MOV AL, 99H

ADD AL, 01H

DAA.

d) Write the appropriate 8086 instruction to perform the following instruction.

i) Multiple AL register contents by 4 using shift instruction.

ii) Move 2000H into CS register.

3. Attempt any <u>THREE</u> of the following: **12**

a) Convert the following decimal to Octal and Hexa decimal. Also explain steps.

i) $(297)_{10} = (\quad)_8$

ii) $(453)_{10} = (\quad)_{16}$

b) Give the application of each of following :–

i) Latch

ii) Flip-Flop

iii) Counter

iv) Buffer.

Marks

c) Differentiate between minimum and maximum mode operation of 8086 microprocessor.

d) Explain any four rotation instructions of 8086 microprocessor with example.

4. Attempt any THREE of the following: **12**

a) Simplify the given equation into standard SOP form $Y = AB + A\overline{C} + BC$ and Represent the same equation in standard POS form with logic gate diagram.

b) Write an appropriate 8086 instruction to perform following operation.

i) Initialize stack of 4200H

ii) Multiply AL by 05H.

c) Describe memory segmentation in 8086.

d) Explain following instructions for 8-bit and 16-bit data.

i) PUSH

ii) DAA

iii) IDIV

iv) XOR.

e) Minimize the expression and draw logic circuit using basic gates

$F(A, B, C, D) = \pi m (0, 2, 4, 6, 7, 10, 11, 14, 15)$

5. Attempt any TWO of the following: **12**

a) Write an assembly language program of 10 Bytes in an ascending order. Also draw flowchart for the same. Assume suitable data.

b) Describe the addressing modes of 8086 and describe them with an example.

c) Simply the following using K–map and realize using NAND-NAND gates:–
$F (A, B, C, D) = \Sigma m (0, 1, 2, 5, 13, 15)$.

Marks

6. Attempt any TWO of the following: **12**

a) State both theorem and prove De-Morgan's theorems. Simplify using Boolean algebra.

(A + B) (A + C).

b) Write assembly language program to add BCD numbers in an array of 10 numbers. Assume suitable array with BCD number Stored the result at the end of array.

c) Describe the concept of pipelining and process of physical address generation in 8086 microprocessor with example.