Name : .....

Roll No. : .....

Invigilator's Signature : .....

2009

MICROPROCESSOR AND MICROCONTROLLER

Time Allotted : 3 Hours | Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for any *ten* of the following : $10 \times 1 = 10$

   i) Whenever the PUSH instruction is executed the stack pointer is

      a) decremented by 1

      b) decremented by 2

      c) incremented by 1

      d) incremented by 2.

   ii) A single instruction to clear the lower four bits of the accumulator in 8085 microproessor is

      a) XRI OFH b) ANI FOH

      c) ANI OFH d) XRI FOH.

iii) Machine cycles in "CALL" instruction are

a) 6 b) 5

c) 4 d) 3.

iv) Address lines required for 32 k-byte memory chip are

a) 13 b) 14

c) 15 d) 16.

v) For 8255 PPI the bi-directional mode of operation is supported in

a) Mode 1 b) Mode 0

c) Mode 2 d) Either (a) & (c).

vi) The CWR address of 8255 connected to 8085 is FBh. What will be the address for Port A ?

a) F8h b) FA h

c) FC h d) F9 h.

vii) The Segment and Offset address of the instruction to be executed by 8086 microprocessor are pointed by

a) CS AND SI b) DS and IP

c) CS and SP d) CS and IP.

viii) Mode 2 of 8253 is

a) Square wave generator

b) Rate generator

c) Software trigger stroke

d) Hardware trigger strobe.

ix) PSW is a ..... register.

a) 8 bit b) 16 bit

c) 20 bit d) 32 bit.

x) If READY pin is grounded, it will introduce ..... states into the bus cycle of 8086 microprocessor.

a) wait b) idle

c) wait and remain idle d) all of these.

xi) The call location for TRAP interrupt is

a) 0000h b) 0020h

c) 0024h d) 0034h.

xii) In order to enable TRAP interrupt, which of the following instructions is are needed ?

a) EI only b) SIM only

c) EI and SIM d) none of these.

xiii) In 8085 microprocessor, the addressable memory is

a) 64 KB b) 1 MB

c) 4 KB d) 16 KB.

xiv) What is the length of SP (stack pointer) of 8085 μP ?

a) 6 bits b) 8 bits

c) 12 bits d) 16 bits.

xv) What will be the content of the accumulator and status of CY flag after RLC operation, if the content of the accumulator is BC H and CY is 0 ?

a) 79 H, 1 b) 78 H, 1

c) 5E H, 0 d) 5D H, 0.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. a) Differentiate between peripheral mapped I/O and memory mapped I/O.

b) What are the functions of ALE, HOLD and READY ?

3. The following sequences of instructions are executed by 8085 μP :

C000	LXI SP, D050
C003	POP H
C004	XRA A
C005	MOV A, H
C006	ADD L
C007	MOV H, A
C008	PUSH H
C009	PUSH PSW
C00A	HLT

D050	05
D051	40
D052	52
D053	03
D054	XX

What are the contents of Stack Pointer (SP), Program Counter (PC), Accumulator and HL pair ?

4. **Discuss the functions of following instruction of 8085 :** 5×1

RAR, LHLD C020H, DAD, CALL D050H, DCX B

5. What are the advantages of having segmentation ? How does 8086 μP support sementation ? 3 + 2

6. What is subroutine ? What is the difference between CALL & JMP instructions ? 2 + 3

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) How many ports are there in 8255 and what are they ?

b) Discuss the different bits of the control word of 8255.

c) Write down the MODE-0 control word for the following :

i) Port A = Input

ii) Port B not used

iii) Port C upper = Input, Port C lower = output.

d) Discuss BSR operation of 8255. 2 + 5 + 3 + 5

8. a) Explain how 20-bit physical address is generated in 8086 microprocessor.

b) What is the purpose of queue ? How many words does the queue store in the 8086 microprocessor ?

c) How does 8086 support pipelining ? Explain.

d) What are the advantages of having memory segmentation ? 3 + (1 + 3 + 5 + 3)

9. a) Describe the priority scheme & EOI scheme of 8259.

b) Write down the format of ICW1 & ICW2 of 8259.

c) With respect to 8237 explain the DMA operation. 5 + 5 + 5

10. a) Write a program to find out the largest number, starting from D000 H of 10 numbers and store result in D050 H.

b) Write a program to find out square of a data using LookUp table. $7\frac{1}{2} + 7\frac{1}{2}$

11. a) What are the vectored and non-vectored interrupts ?

b) Explain the instruction RIM and SIM. Write the program for enable the RST-7·5, RST-6·5 and disable RST-5·5.

c) Discuss how 8253 is used to generate square wave.

d) What are the major components of 8259A interrupt controller ? Explain their functions.

e) Write the BSR control word for setting PC_4 in 8255A.

2 + 5 + 3 + 3 + 2