Total No. of Questions : 8] [Total No. of Printed Pages : 2

Roll No. .....

MCA–304(O)

M. C. A. (Third Semester) EXAMINATION, June, 2008

(Old Course)

MICROPROCESSOR AND INTERFACES

[MCA–304(O)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Draw the pin diagram of 8086. Explain the function of each pin.
   (b) What are the interrupts ? Explain 8086 interrupt system.

2. (a) What are the different segments of 8086 ? Describe the organization and functionality of each segment in memory.
   (b) Explain memory interfacing with 8086.

3. (a) How will you determine the control word for 8255 ? Discuss its various modes of operation.
   (b) Draw the architecture of PIC 8259 indicating different blocks and their interconnection. Explain its operation.

4. (a) Discuss how 8253/8254 is used :
   (i) to generate square wave
   (ii) to generate delay

P. T. O.

(b) Explain the block diagram and function of each block of 8251 USART.

5. (a) Describe the importance of Direct Memory Access (DMA) Scheme. Draw the block diagram and explain the operation of 8257 DMA Controller.

(b) Explain the block diagram and operation of programmable Keyboard/Display interface (8279).

6. (a) Explain the interfacing of A/D convertor with 8086 through 8255, with the help of neat diagram.

(b) Enlist and compare the salient features of 8086, 80286, and 80386.

7. (a) Give a simplified architecture of 80286.

(b) Explain the role of microcontrollers in embedded systems.

8. Write short notes on any *two* of the following :

(a) Bus transfer technique with read/write cycle

(b) Instruction set of 8086

(c) Diskette controller 8272

(d) Microprocessor vs microcontroller

Total No. of Questions : 8] [Total No. of Printed Pages : 2

MCA–304(O)

M. C. A. (Third Semester) EXAMINATION, Nov.-Dec., 2007

(Old Course)

MICROPROCESSORS AND INTERFACES

[MCA–304(O)]

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Write with function different registers of 8086. 10

   (b) What is the function of interrupt ? Specify and explain functioning of different interrupts of 8086 microprocessor. 10

2. (a) Explain the following instructions of 8086 microprocessor : 10

   (i) AAS

   (ii) XCHG

   (iii) DEC

   (iv) JNE/JNZ

   (v) RET

   (b) Specify the purpose of the following pin signals : 10

   (i) INTR

P. T. O.

(ii) $\overline{BHE}$/S7

(iii) ALE

(iv) QSO

(v) $\overline{TEST}$

3. Write an assembly language program for the following :

   (a) To arrange a given series of hexadecimal number in ascending order. 10

   (b) For multiplication of three, 8 bit numbers stored in memory. Store result again in memory. 10

4. (a) Draw the functional block diagram of 8254 chip. 10

   (b) How will you interface 8254 to 8086 micropocessor ? Explain with the help of diagram in short. 10

5. What is the function of USART chip ? How will you interface USART to 8086 microprocessor ? Explain. 20

6. Explain with the help of functional block diagram of keyboard and display controller (8279). 20

7. Give answer in short for 80386 microprocessor : 20

   (i) Its internal architecture

   (ii) Its flag register

   (iii) Register organisation

   (iv) Its physical address formation in real address mode

8. Compare the following : 10 each

   (i) 80286/80386/8086 microprocessor

   (ii) Microprocessor and Microcontroller

Total No. of Questions : 8] [Total No. of Printed Pages : 2

MCA–304

M. C. A. (Third Semester)
EXAMINATION, May/June, 2006
MICROPROCESSORS AND INTERFACES
(MCA—304)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Draw the block diagram showing architecture of 8086 and explain the functions of each block.
   (b) Describe the function of 8086 queue. How does the queue speed up processing ?

2. (a) Explain the different interrupts available in 8086.
   (b) Explain the different addressing modes of 8086.
   (c) What is the difference between an intersegment and intrasegment jump ?

3. (a) Write an assembly language program to calculate the factorial of a given 8 bit integer number.
   (b) Why must you use an IRET instruction rather than the regular RET instruction at the end of an interrupt service routine ?
   (c) What are the different flag bits available in 8086 ?

P. T. O.

4. (a) An 8255 A has a system base address of FFF9H. What are the system address for the three ports and control register for this 8255 A ?

   (b) Show the mode set control word needed to initialize an 8255 A as follows. Port A – handshake input, Port B – handshake output, Port C bits PC_6 and PC_7 as outputs.

   (c) Show the assembly language instructions to send the control words to 8255 A considering address scheme of Part (a).

5. (a) Differentiate between I/O mapped I/O and memory mapped I/O.

   (b) What are the various types of address decoding ? Explain them.

   (c) What do you understand by even and odd addressing of memory in 8086 CPU ?

6. (a) With the help of neat diagram describe the logical Pin out diagram of 80286 CPU.

   (b) Explain with the help of block diagram 8251.

7. (a) Draw circuit showing how A/D converter of various types can be interfaced to a microcomputer.

   (b) Draw a block diagram of 8272 and explain its functions.

8. Write short notes on any *two* of the following :

   (a) Microcontrollers

   (b) 80386 architecture

   (c) Embedded systems

Total No. of Questions : 8] [Total No. of Printed Pages : 2

MCA–304

M. C. A. (Third Semester) EXAMINATION, June, 2005

MICROPROCESSORS AND INTERFACES

(MCA – 304)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) What are the different registers ? Which are available in 8086 write their functions also ? 10

   (b) Draw and explain architecture of 80286 microprocessor. 10

2. (a) Write with example addressing modes of 8086 microprocessor. 10

   (b) What are the different jump instructions available in 8086 instruction set ? Write in short with examples. 10

3. (a) How you will form control word to put peripheral Interface chip in different modes of operation ? Explain. 10

   (b) Draw the functional block diagram of peripheral Interface chip. 10

P. T. O.

4. Draw the functional block diagram of priority interrupt controller and explain its initialisation command words and operational command words. 20

5. How you will interface A/D converter chip with 8086 microprocessor ? Write in detail. 20

6. How you will interface DMA controller to 8086 microprocessor ? Explain in detail. 20

7. Draw the funtional block diagram and explain in short : 20
   (a) Keyboard and display controller
   (b) Diskett controller

8. Write short notes on any *three* of the following : 20
   (a) Microcontroller in embedded system
   (b) Architecture of 80386 microprocessor
   (c) Push and Pop instruction of 8086 microprocessor
   (d) Bus operation of 8086
   (e) CRT controller

Total No. of Questions : 8] [Total No. of Printed Pages : 2

MCA–304

M. C. A. (Third Semester)
EXAMINATION, Dec., 2005
MICROPROCESSORS AND INTERFACES
(MCA–304)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Draw the block diagram showing the architecture of 8086 microprocessor and explain the function of its major blocks.

   (b) With the neat diagram explain the Bus read cycle of 8086.

2. (a) Describe the instruction format of 8086. Also describe the MOV instruction of 8086.

   (b) Explain the different interrupts available in 8086. Also give their priorities.

3. (a) Write a program in 8086 assembly language to count the number of positive and negative number in a given series of numbers.

P. T. O.

(b) Differentiate between the following :

(i) I/O mapped I/O and memory mapped I/O

(ii) Full address decoding and partial address decoding

4. (a) Explain with the help of a neat diagram, how AD convertor can be interfaced to 8086 through 8255.

(b) Give the block diagram of 8259 and explain the function of each block. Also give the initialization sequence of 8259.

5. (a) Explain in brief with the help of diagram interfacing of 8251 (USART) with 8086.

(b) Give comparison between synchronous and asynchronous data transmission.

6. Give a simplified architecture of 80386 and compare it with 8086. List the advancements of 80386 over 8086.

7. (a) Differentiate between microprocessors and microcontrollers.

(b) What is the function of timers in microcontrollers ?

(c) Write a note on the role of microcontrollers in embedded systems.

8. Write short notes on any *two* of the following :

(a) JMP instructions of 8086

(b) CRT controller

(c) Design considerations for microprocessor based systems

Total No. of Questions : 8] [Total No. of Printed Pages : 3

MCA–304

M. C. A. (Third Semester) EXAMINATION, June, 2004

MICROPROCESSOR AND INTERFACES

(MCA–304)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. Each question carries equal marks.

1. (a) Draw and explain the internal block diagram of 8086.

   (b) Construct the binary code for each of the following 8086 instructions :

   (i) MOV BL, AL

   (ii) MOV [BX], CX

   (iii) ADD, BX, 59H (DI)

   (iv) SUB [2048], DH

   (v) NOP

2. (a) Draw and explain the signal activities on the 8086 micro computer buses during simple read and write operations.

   (b) Describe how a logic analyzer is connected to micro computer signal lines and how it is used to make state and timing measurement ?

P. T. O.

3. (a) Describe the condition(s) which cause the 8086 to perform each of the following types of interrupt :
type 0, type 1, type 2, type 4

(b) Show the hardware connections and the programme that can be used to interface keyboards to a micro computer.

4. (a) Draw and explain the internal block diagram of 8255 A Programmable parallel port device.

(b) Describe the operation of D/A converter and define D/A data sheet parameters, such as resolution, setting time, accuracy and linearity.

5. (a) Show how a direct memory access [DMA] controller device can be connected in a 8086 system and describe how a DNA data transfer takes place ?

(b) Draw circuits showing how A/D converter of various types can be interfaced to a micro computer ?

6. (a) With the help of a simple drawing, explain how a interlaced and non-interlaced raster is produced on a circuit.

(b) (i) Describe the difference between time-slice scheduling and preemptive priority-based scheduling.

(ii) Describe how system programs are developed for an 80386 or 80486 protected-mode system ?

7. (a) (i) List the evolutionary advances that the 80386 has over the 80286.

(ii) Show how the 80286 constructs physical addresses in its real address mode and in its protected virtual address mode ?

(b) Describe how an SRAM cache reduces the average number of wait states required by a microprocessor which uses DRAM for its main memory ?

8. Write short notes on the following :

(i) Membrane key switches

(ii) Deadlock

(iii) Critical region and semaphore

(iv) Time slice and preemptive priority-based scheduling

(v) Coprocessor 8087

Total No. of Questions : 8] [Total No. of Printed Pages : 2

MCA–304

M. C. A. (Third Semester) EXAMINATION, Dec., 2004

MICROPROCESSOR AND INTERFACES

(MCA – 304)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Give a pin diagram of 8086 and explain the function of various pins.

   (b) Explain the 8086 bus operation in detail.

2. (a) How many interrupts are there in 8086 ? Explain them.

   (b) Write a program to copy a block of data from one memory area to another.

3. (a) What are the important points to be considered in memory interfacing ? Differentiate between I/O mapped I/O and memory mapped I/O.

   (b) Explain various operating modes of 8255.

4. (a) Give the functional description of programmable DMA controller 8257 with the help of diagram.

P. T. O.

(b) With the help of neat diagram discuss various modes of 8254.

5. (a) Compare Intel 80286 with 8086 model.

(b) Give the role of microcontrollers in embadded system.

6. (a) Explain the following instructions of 8086 :

(i) PUSH mem/reg

(ii) XCHG reg

(iii) SBB mem/reg, Data

(iv) DAS

(v) MUL mem/reg

(b) How instructions are broadly classified in 8086 ? Explain with suitable examples.

7. (a) What is Program Status Word (PSW) register ? Give its format and explain the working of all the flags of 8086.

(b) Explain with the help of a neat diagram how ADC can be interfaced to 8086 through 8255A.

8. Write short notes on any *two* of the following :

(i) 8086 architecture

(ii) Register organisation of 8086

(iii) Addressing modes of 8086

(iv) USART

Total No. of Questions : 8] [Total No. of Printed Pages : 2

MCA–304

M. C. A. (Third Semester) EXAMINATION, June, 2003

MICROPROCESSORS AND INTERFACES

(MCA–304)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Give the elementary block schematic of the 8086 processor. What is Execution Unit (EU) and the BUS interface unit (BIU) ? Explain in detail.

   (b) Explain the function of various registers and flags of 8086.

2. (a) Explain various addressig modes of 8086.

   (b) Write a program to find the maximum in a given series of data.

3. (a) Explain memory mapped I/O and I/O mapped I/O methods of I/O interfacing in 8086. Compare the two.

   (b) Discuss how 8254 is used to generate delay, square wave, programmable one shot, Hardware triggered mode ?

P. T. O.

4. (a) Draw the block diagram of 8259 and explain the function of each block.

   (b) Discuss how to determine the control word for 8255 ?

5. (a) Compare 80386 microprocessor with 8086 model.

   (b) Explain the working of USART.

6. (a) Explain the following instructions of 8086 :

   (i) DAA

   (ii) LDS reg, mem

   (iii) CMP mem/reg, data

   (iv) AAM

   (v) DIV mem/reg

   (b) Explain the function of following pins of 8086 :

   (i) NMI

   (ii) MN/$\overline{MX}$

   (iii) QS_1 ($\overline{INTA}$)

   (iv) QS_0 (ALE)

   (v) $\overline{TEST}$

7. (a) What are the various interrupt instructions for the microprocesor 8086 ? Explain their working.

   (b) Explain with the help of a diagram how DAC can be interfaced to 8086.

8. Write short notes on any *two* of the following :

   (i) Pin diagram of 8086

   (ii) Bus operation of 8086

   (iii) Interrupts in 8086

   (iv) USART

Total No. of Questions : 8] [Total No. of Printed Pages : 3

MCA–304

M. C. A. (Third Semester) EXAMINATION, Dec., 2003

MICROPROCESSORS AND INTERFACES

(MCA–304)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) (i) Describe the function of the 8086 queue.
   (ii) How does the queue speed up processing ?
   (b) (i) If the code segment for an 8086 programs starts at address 70400 H, what number will be in the CS register ?
   (ii) Describe the signal sequence on the bases as a simple 8086-based micro computer fetches and executes an instruction.

2. (a) Draw and explain in Pin diagram 8086.
   (b) Describe the function and direction of the following signals in a centronics parallel printer interface :
   (i) $\overline{\text{STROBE}}$
   (ii) $\overline{\text{ACKNLG}}$
   (iii) $\overline{\text{BUSY}}$
   (iv) $\overline{\text{INT}}$

P. T. O.

3. (a) Construct the Binary code for each of the following 8086 instructions :

   (i) MOV CX, [437 AH]

   (ii) MOV CS : [BX], DL

   (iii) IN AL, 05 H

   (iv) ADD AL, 07 H

   (v) INT 3

   (b) Draw and explain the Internal block diagram of 8255 A programmable parallel port device.

4. (a) Show the hardware connectors and the programs that can be used to interface keyboards to a micro computer.

   (b) Draw circuits showing how A/D converter of various types can be interfaced to a micro computer ?

5. (a) With the help of a simple drawing, explain how a interlaced and non-interlaced raster is produced on a CRT.

   (b) (i) Describe the difference between time-slice scheduling and pre-emptive priority-based scheduling.

   (ii) Describe how system programs are developed for an 80386 or 80486 protected-mode system ?

6. (a) (i) List the evolutionary advances that the 80386 has over the 80286.

   (ii) Show how the 80286 constructs physical address in its real address mode and in its protected virtual address mode ?

   (b) Describe how an SRAM Cache reduces the average number of wait states required by a microprocessor which uses DRAM for its main memory ?

7. (a) Describe the operation of D/A converter and define D/A data sheet parameters, such as resolution, setting time, accuracy and linearity.

   (b) Show how a Direct Memory Access [DMA] controller device can be connected in a 8086 system and describe how a DMA data transfer takes place ?

8. Write short notes on the following :

   (i) DB, DW and DD directives

   (ii) Type of key switches

   (iii) Coprocessor 8087

   (iv) Deadlock

   (v) Semaphore

Total No. of Questions : 8] [Total No. of Printed Pages : 3

MCA – 304

M. C. A. (Third Semester) EXAMINATION, Dec., 2002

MICROPROCESSORS AND INTERFACES

(MCA – 304)

Time : Three Hours

Maximum Marks : 100

Minimum Pass Marks : 40

Note : Attempt any *five* questions. All questions carry equal marks.

1. (a) Draw the 8086 pin diagram. Explain the functionality of different pins. 10

   (b) What are the different segments of 8086 ? Describe the organization and functionality of each segment in memory. 10

2. Explain the usage of following instructions with an example : 20

   (i) ROR

   (ii) IRET

   (iii) LDS

   (iv) LOOPE

   (v) OUT

P. T. O.

3. (a) Explain different addressing modes of 8086. 10

   (b) Write an assembly program to add elements of two arrays and store the result in another array. 10

4. (a) What are interrupts ? Explain 8086 interrupt system. 10

   (b) Write an assembly program for equivalent C code : 10

```
Sum = 0
for (i = 0; i < = 20; i++)
SUM = SUM + a [i]
```

5. (a) Explain the following : 10

   LINKER AND LOCATOR

   DEBUGGER

   (b) Describe the sequence of signals that occur on the address bus, control bus and data bus. When a simple microcomputer fetchs an instruction ? 10

6. (a) (i) Explain the MOV instruction of 8086. 5

   (ii) Describe the instruction Format of 8086. 5

   (b) Explain different JUMP instruction of 8086. 10

7. (a) (i) SPOT the syntax (grammatical) errors if any in the following : 5

```
MOV BH AX
MOV 7632 H CX
AND AL OFH
ADD AL 2073H
OUT DX AL
```

   (ii) Differentiate between the following : 5

```
MOV AX 2437H
MOV AX [2437H]
```

(b) What will be the value of registers after the execution of each step of the program ? (AX = 0001H, BX = 020 AH, CX = OFAIH, DX = 0030 H) 10

```
PUSH AX
PUSH BX
PUSH CX
PUSH DX
INC CX
ADD AX BX
POP AX
POP DX
POP BX
POP CX
```

8. Write short notes on any *two* of the following : 20

(i) Programmable interrupt controller

(ii) 8272 floppy disk controller

(iii) Memory organization of 80286