Subject: - Microprocessor *(EE 551)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. Explain the processing cycle of a stored program computer. Differentiate between Hardwired and MicroProgrammed control unit. [4+4]

2. Draw the pin diagram of the 8086 microprocessor and explain the functions of each pin. [8]

3. Comment on the instruction format of 8085 with example. Explain the working of IMP and CALL instructions. [4+4]

4. Write a 8085 program to calculate the sum of series of odd numbers from the list of 20 numbers. The length of the list is in memory location 2200 H. Assume the sum to be 16-bit. Store the sum at memory locations 2300 H and 2301 H. [8]

5. What is addressing mode? Discuss on all types of addressing modes that 8086 offers. [1+7]

6. Write an assembly language program in 8086 to input a string, count the words of this string whose length is greater than 5 and display this count in the clear screen. [8]

7. Provide the timing diagram for the single and double handshake protocols. [4]

8. Draw the timing diagram of the instruction INR M. [4]

9. Define I/O mapped I/O and Memory mapped I/O. Design an address decoding circuit to interface two 4 kB RAM blocks and two 2 kB ROM block starting at memory location 1000 H. [3+5]

10. Differentiate between polling and interrupt. What is IVT? Explain the IVT organization of 8086. [4+1+3]

11. Write short notes on: [2×4]

a) Flynn's classification
b) Register based microprocessor architecture

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Exam.		Back	
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessor *(EE 551)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt *All* questions.
✓ The figures in the margin indicate *Full Marks*.
✓ Assume suitable data if necessary.

1. Explain stored program concept used in Von-Neumann computer. [4]

2. Write the RTL for instruction STA 3055H in 8085 microprocessor. [4]

3. Draw the programming model of 8085 microprocessor and explain the following instructions of 8085 with syntax and example: JNZ, POP and CALL. [2+6]

4. 15 bytes of data are stored in first array in memory. Write an ALP in 8085 to store number of 1's and number of 0's of each byte in second and third array in memory. [8]

5. Define addressing modes and explain various modes available in 8086 microprocessor with examples. [8]

6. Write an ALP in 8086 to read a string in parametric way and display number of vowels and digits in cleared window. [8]

7. Design the address decoding circuit or interface for one ROM and three RAMs of 8 KB each with 8085 microprocessor with base address 4000H. [6]

8. Explain the operations of HOLD and HLDA pins of 8085 used in DMA with block diagram showing DMA controller. [5]

9. Define serial and parallel interface. Describe the modes of parallel data transfer. [2+3]

10. Draw the memory structure of IVT in 8086 and explain Type 1 and Type error. devide [4]

11. Define interrupt and explain its different types. [4]

12. Write the major features of DSP. [4]

13. Explain Flynn's classification of computer system. [4]

14. Write short notes on: (Any Two) [2×4]
    a) Flags of 8085
    b) EXE and COM programs
    c) OS and its functions

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Exam.		**Regular**	
Level	BE	Full Marks	80
Programme	BEL,BEX,BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessor *(EX 551)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. What is RTL? Write down the RTL code for the instruction LXI H, 3000H

2. Draw the internal architecture of 8085 microprocessor and explain its each block.

3. An array of bytes is stored starting from memory location C301H. Length of this array is stored in memory location C300H. Write an assembly language program in 8085 to add upper and lower nibble of each byte and store the sum starting from memory location C401H.

4. Explain the addressing modes of 8085 microprocessor with examples

5. Explain different types of directives of 8086 microprocessor with an example. Define assembling, linking and executing process of an assembly language program.

6. Write ALP in 8086 which will input the user name from the keyboard. If the user is "Tribhuvan University" it will output "The username is valid "else it will output "Invalid user name".

7. Draw the timing diagram for the instruction JMP 8080H. Assume the instruction is stored in memory starting at 2000H.

8. Differentiate between the RS 422 and RS 423 serial interfacing standards.

9. Design the address decoding interface of an input port and output port for 8085 at FAH and F8H address. Use at least one 74LS 138 decoder. Explain clearly how the microprocessor reads/ writes to this input and output devices. Assume simple input and output.

10. Explain the SIM instruction in 8085. How interrupt are handled in 8085 microprocessor?

11. Write notes on:
    a) RISC and CISC Architectures
    b) Features of operating systems

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Exam.		Back	
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessor (EE 551)

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ **All** questions carry equal marks
✓ Assume suitable data if necessary.

[1+7] 1. Define stored program concept. Differentiate between Accumulator based processor with register based processor. Write the RTL for instruction LXI H, 20 H in 8085 processor.

[8] 2. What is the use of Program Counter and Stack Pointer registers of 8085 microprocessor? How these registers get affected during CALL, RET, PUSH and POP instructions explain with suitable example.

[8] 3. A set of 10 numbers are stored in memory location CO70 H onward. WAP in 8085 to test whether the number is odd or even. Store the even number in separate list starting from memory location CO90H.

[5+3] 4. Discuss and differentiate between Bus Interface Unit (BIU) and Execution Unit (EU) of 8086 microprocessor. Write about flags of 8086.

[8] 5. Write a program for 8086 to find the largest and smallest value from a list of ten 16 bit data and store the result in maxval and minval variable.

[4] 6. What do you mean by synchronous and asynchronous bus? Draw the bus timing diagram for STA 3050H which is stored in stored in memory location 8200H.

[4] 7. Explain different modes of parallel data transfer. Explain in brief about PPI.

8. How is interrupt processing differs from pooling? Write general sequence to be followed when interrupt occurs.

[5+3] 9. Discuss about Flynn's Classification. What are the key features having with a typical Operating system?

[3+5] 10. Write short notes on: (Any Two)
[2×4] a) USART
b) EXE and COM Program

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Exam.		Back	
Level	BE	Full Marks	80
Programme	BEL, BCT, BEX	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessor (EX 551)

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt _All_ questions.
✓ The figures in the margin indicate _Full Marks_.
✓ Assume suitable data if necessary.

1. What are the basic characteristics that differentiate microprocessor? Define stored program concept. Differentiate between Von Neumann and Harvard Architecture. [2+2+4]

2. What are the features of 8085 microprocessor? Explain the instruction format and data format of 8085 microprocessor. [4+4]

3. There are 40 8-bit numbers in a table with address starting form 9090H. Write a program in 8085 to transfer these numbers to another table with address form A010H if lower nibble of a number is greater than higher nibble. Otherwise transfer by setting bit D2 and resetting bit D6. [8]

4. Explain Execution unit of 8086 with diagram? How is a 20 bit physical memory address calculated in the 8086 microprocessor? Explain with example. [5+3]

5. Write an assembly language program in 8086 to input two decimal numbers of single digit, multiply them and display the result in the clear screen. [8]

6. What do you mean by DMA (Direct Memory Access)? Explain the operation of a typical DMA controller in context of 8085 using HOID and HIDA pins. [2+6]

7. Explain different modes of parallel data transfer. Describe the execution of instruction ADD M using RTI or bus timing diagram. [4+4]

8. What do you mean by interrupt? How interrupt is handled in 8085 microprocessor? Explain SIM and RIM instruction in detail. [1+3+4]

9. Explain Flynn's Classification? What are the key features of a typical operating system? [4+4]

10. Write short notes on: (Any Two) [2×4]

    i. Flag register in 8086
    ii. RS 232
    iii. PPI device 8255

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TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2077 Chaitra

Exam.		Regular	
Level	BE	Full Marks	80
Programme	BEL, BCT, BEX	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessor *(EX 551)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. Define stored program concept. How Harvard Architecture differs from von Neumann Architecture? Explain. Differentiate between hardwired and microprogrammed control unit. [2+3+3]

2. Define addressing mode. Explain different types of addressing modes of 8085 microprocessor along with examples. [2+6]

3. Write a program in 8085 to count the odd and even parity numbers of 150 data stored in the memory location starting from C050H. Store the counts at memory locations D000H and D001H. [8]

4. Draw the internal architecture of 8086 microprocessor. Explain flag register of 8086 microprocessor. [6+2]

5. Write a program in 8086 to read a string from user. Count the number of uppercase letter and lowercase letter in a string and display the count separately. [8]

6. Write down the features of 8255A PPI. Draw the timing diagram of MVI M, 30H and explain it. [3+5]

7. Design an address decoding circuit to interface two 2732 (1K×8) EPROM and one 6116 (2K×8) RAM using 74LS138 (ie.) 3 to 8 decoder starting memory location 1000H. [8]

8. What is Interrupt Service Routine. Explain how does 8086 responds to interrupts. [3+5]

9. Describe various organizations of multiprocessing system. Explain various features of modern operating system. [4+4]

10. Write short notes on: (Any Two) [2×4]

a) Directives used in assembly programming
b) DMA
c) RS 232

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Subject: - Microprocessor (EX 551)

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. Explain the different components of microprocessor based system with necessary figure. Differentiate between microprocessor and microcontroller. [5+3]

2. Explain the function of following pin signals of 8085 microprocessor: HOLD, HLDA, READY, $\overline{RD}$, $\overline{WR}$, IO/$\overline{M}$, ALE, $\overline{INTA}$ [8]

3. Explain the operation of following instructions of 8085 with syntax, size, and flag status with examples: STA, SHLD, DCX, RLC, POP, LDAX, DAD, SBB [8]

4. Write a program in 8085 to find the largest and smallest bytes from the list of 20 bytes stored starting from memory location C050 H. Store the largest byte and smallest byte in C070 H and C071 H respectively. [8]

5. What is statement in assembly language programming? Explain most frequently used five directives. [3+5]

6. Write an assembly language program in 8086 to read a string and display it in next line with first letter in uppercase and rest in lowercase for each word. [8]

7. What are different machine operations of 8085 microprocessor? Explain the bus timing cycle of ADI 25H (op code) with timing diagram. [3+5]

8. What is programmable peripheral interface (PPI)? Write down the different modes of operation available in PPI. Explain how different modes of PPPI can be used. [2+6]

9. What are vectored and non-vectored interrupts? List and explain different interrupts available in 8085 microprocessor. How interrupts are handled by 8085 microprocessor. [2+6]

10. What are the features of RISC architecture? Differentiate register based and accumulator based architecture. [5+3]

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Exam.		Regular	
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessor (EE551)

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. Describe Von Neumann Machine. Differentiate Hardwired control unit and Micro programmed control unit. [4+4]

2. Draw the internal architecture of 8086 microprocessor and explain it. [8]

3. How is looping is implement in 8085 programs? Explain how nested looping can be done. Elaborate with suitable example. [8]

4. Write a program for 8085 to count the numbers for which upper nibble is higher than the lower nibble; and store the count at the end of table having 50 bytes data from C050H. [8]

5. Explain the process of assembling, linking and executing of assembly language program. Differentiate one-pass and two pass assembler. [5+3]

6. Write and assembly language program for 8086 to read a number (1 to 9 only) from user and calculate the factorial of it and display in decimal format. [8]

7. What is instruction cycle and machine cycle? Explain the timing diagram instruction LXI B, A050H with necessary diagram. [2+6]

8. Differentiate synchronous bus and asynchronous bus. Design an address decoding circuit to interface 4 KB ROM and 2KB RAM. The starting address is 4000 H. Use suitable decoder. [2+6]

9. Differentiate polling vs. interrupt. Explain how interrupt vector table is used to handle interrupts in 8086 microprocessor. [2+6]

10. What is pseudo and real parallelism? Explain Flynn's Classification. [4+4]

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Exam.		Back	
Level	BE	**Full Marks**	80
Programme	BEL, BEX, BCT	**Pass Marks**	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessor *(EX551)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. a) Compare and contrast between hardwired and microprogrammed CU. [4]

   b) Write the RTL for instruction *LXI H, 75H* in 8085 microprocessor. [4]

2. a) Draw the programming model of 8085 and explain each unit. [2+4]

   b) Explain the operations and uses of *RST* instructions in 8085. [4]

   c) Write an ALP in 8085 to transfer 20 bytes of data in a table to another table by interchanging D_1 and D_4 bits of each byte. [6]

3. a) Explain the different types of addressing modes available in 8086 microprocessor with examples. [8]

   b) Write an ALP in 8086 to read a word and display all the alphabets in alternate case (first alphabet in lowercase, second in uppercase, third in lowercase and so on) in a clear window. [8]

4. a) Design the address decoding interface of an output port consisting of 8 LEDs with port address *ABH*. [5]

   b) Explain different modes of operation in 8255. [6]

   c) Explain the execution of instruction *ANI 4BH* in 8085 with the help of timing diagram. [5]

5. a) Describe the operation of interrupt instruction *RIM* in 8085 microprocessor. [4]

   b) Explain the Interrupt processing in 8086 microprocessor. [4]

6. a) Write the characteristics of RISC.. [4]

   b) Explain six stage pipeline technique with an example. [4]

7. Write short notes on any two: [2X4]

   a) One pass and two pass assembler

   b) DMA Controller

   c) OS and Its features

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TRIBHUVAN UNIVERSITY

INSTITUTE OF ENGINEERING

Examination Control Division

2074 Bhadra

Exam.		Regular	
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessor (EX551)

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. Explain fetch and execution cycle of an instruction of a stored program computer. Illustrate with the help of RTL specification. [5+3]

2. What is the use of Program Counter and Stack Pointer registers of 8085 microprocessor? How these registers get affected during CALL, RET, PUSH and POP instructions explain with suitable examples. [4+4]

3. There are two tables holding twenty data whose starting address is 9000H and 9020H respectively. Write a program to add the content of first table with the content of second table having same array index. Store sum and carry into the third and fourth table indexing from 9040H and 9060H respectively. [8]

4. Describe how 8086 microprocessor is faster than 8-bit microprocessors in terms of its instruction processing. Write in brief about the uses of major registers of 8086 microprocessor. [3+5]

5. Write an assembly language program for 8086 to calculate the addition of 100 natural even numbers and display the result in screen, in decimal format. [8]

6. Explain single handshaking and double handshaking technique used in parallel interfacing with a microprocessor? Design an address decoding circuit to interface two 8k*8 ROM chips at address starting at 4000H. [3+5]

7. What do you mean by Machine cycle and T-states? Draw a bus timing diagram for an instruction ANI 55H of 8085 microprocessor. Calculate the time required to execute such instruction, if microprocessor is operating at 2MHz clock frequency. [2+5+1]

8. What are the software interrupts of 8085? Discuss the different hardware interrupts available in 8086. Write down the steps, sequentially carried out by the systems when an interrupt occurs. [3+3+2]

9. What do you mean by accumulator based microprocessor? Compare RISC and CISC architecture. [2+6]

10. Write short notes on any two: [2×4]

    a) Flags in 8086 Microprocessor
    b) DMA Controller
    c) Deadlock and its Remedies

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Exam.	New Back (2066 & Later Batch)		
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessor (EX551)

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. Differentiate between Microprocessor and Microcontrollers. Explain how the microprocessor is organized in microprocessor based systems. [4+4]

2. What is flag? Discuss about 8085 associated flags. Alone with suitable example show how these flags are affected by arithmetic and logical group of instructions. [1+2+5]

3. Write an assembly language program for 8085 to find the square of ten 8-bit numbers which are ≤ 0FH, stored from memory location C090H. Store the result from the end of the source table. [8]

4. Discuss and differentiate between Bus Interface Unit (BIU) and Execution Unit (EU) of 8086 Microprocessor. List out the operators used in 8086 Assembly Language Programming. [4+4]

5. Two tables contain ten 16-bit data each. Write an assembly language program to generate the 3rd table which contains 1FFFh if the corresponding data in the 1st table is less than that of 2nd table, else store 0000h. [8]

6. Draw an explain the timing diagram of LXI D, 2465 H. Calculate the time required to execute this instruction if the crystal frequency is 6MHZ. [6+2]

7. With a neat diagram explain the interfacing circuit using a 3:8 decoder (74LS138) needed to connect the following memory units to the 8085 microprocessor consecutively starting from memory location AOOOH. [8]

   2K×8 ROM chip

   2K×8 RAM chip

   4K×8 EPROM chip

8. Explain the purpose of the EI, DI, SIM and RIM instructions of the 8085 processor while using interrupts. Describe how the 8085 obtains the starting address of the interrupt service routine for each of the hardware interrupts. [8]

9. Discuss about Flynn's Classification. What are the key features having with a typical Operating system? [4+4]

10. Write short notes on: [4×2]

    i) RS232
    ii) PPI

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TRIBHUVAN UNIVERSITY
INSTITUTE OF ENGINEERING
Examination Control Division
2073 Bhadra

Exam.		Regular	
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessor *(EX551)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. Explain RTL based on any 8085 instruction. Define Stored program concept. [4+4]

2. What are the characteristics of 8085 microprocessor? Discuss all the input and output signals that are originated from microprocessor. [2+6]

3. How are the flags of 8085 processor affected during the usage of arithmetic and logic instructions? Explain with examples. Explain the following instructions with example program (i) DAA (ii) SPHL (iii) XTHL (iv) PCHL [4+4]

4. Draw the internal architecture of 8086 microprocessor. Explain each block in detail. [8]

5. Write an assembly language program for 8086 to find the largest and smallest numbers of an array having 10 numbers. Display the found numbers in the clear screen. [8]

6. Explain bus timing diagram. Draw and explain the timing diagram of the 8085 instruction STA 8050 H. [2+6]

7. Design an interfacing circuit for following problem. [8]

   i)   74LS138:3 to 8 Decoder
   ii) 2732 (4K*8): EP-ROM address range should begin at 0000H and additional 4K memory space should be available for future explanation
   iii) 6116(2K*8):CMOS R/W memory

8. Differentiate between maskable and non-maskable interrupts. Explain how different interrupt pins of 8085 are used. [2+6]

9. What is interprocess communication? How does dead lock occur? How can it be solved? [2+3+3]

10. Write short notes on: [4×2]

    i) USART
    ii) RISC

***

Exam.	Regular		
Level	BE	**Full Marks**	80
Programme	BEL, BEX, BCT	**Pass Marks**	32
Year / Part	II / II	**Time**	3 hrs.

Subject: - Microprocessor *(EX551)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. What is Bus? Explain Bus organization of microprocessor with diagram? Calculate the memory handling capacity of the processor having address bus of 24 lines and data bus of 16 lines. [1+5+2]

2. Explain the instruction format and data format of 8085 microprocessor. Explain different addressing modes of 8085 microprocessor. [3+5]

3. Write a program in 8085 to calculate the number of ones in the upper nibble of ten 8-bit numbers stored in a table. Store the count of ones in a location just after the table. [8]

4. What is statement in an assembly language program? Explain frequently used directives with suitable example. [2+6]

5. Write an assembly program to read a string from the user and display vowels and consonants separately. [8]

6. What do you understand by address decoding? Explain with example how PROM decoder is used in memory address decoding. [2+6]

7. Explain different modes of parallel data transfer. Explain briefly, what is PPI. [4+4]

8. What is interrupt? What is its importance in microprocessor? How interrupts from different peripherals can be handled with single INTR pin in 8086 microprocessor? Explain. [1+2+5]

9. What is register based and accumulator based architecture? Differentiate between CISC and RISC architecture? [2+6]

10. Write short notes on: [2×4]

   a) DMA
   b) INX, XTHL, MUL, JG

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Exam.	New Back (2066 & Later Batch)		
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessor (EX551)

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. Draw and explain the block diagram of a computer. Explain stared program concept. [4+4]

2. What is flag? Discuss about 8085 associated flags. Alone with suitable examples show how these flags are affected by arithmetic and logical group of instructions. [1+2+5]

3. Write a program for 8085 to generate multiplication table of a number stored at 8230H and store the generated table starting at 8231H. For example, if location 8230H has number 05H then store 05H at 8231 H, OAH at 8232H and so on. [8]

4. Draw the internal architecture of 8086 microprocessor. Explain the function of each register accessible to programmer. [8]

5. Write a program in 8086 to read a string and display each word in a separate line in the center of the screen. [8]

6. Draw the timing diagram of STA instruction? Calculate the time taken to execute the following program if T = 1 micro second. [5+3]
   MVI A,05H
   ADI 20H
   OUT 80H
   HLT

7. Design an interfacing circuit to interface one 4 KBEPROM and two 2 KB R/W memory for 8085 microprocessor. [8]

8. What is IVT? How is it used to handle software and hardware interrupts? Explain. [2+6]

9. What is deadlock? What are the conditions for deadlock to occur? Write down the features of DSP chip. [1+3+4]

10. Write short notes on: [4×2]

    a) RS 232

    b) Two pass assembler

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Exam.		Regular / Back	
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessor *(EX551)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **_All_** questions.
✓ The figures in the margin indicate **_Full Marks_**.
✓ Assume suitable data if necessary.

1. Explain the microprocessor based system showing the bus organization. Explain the processing cycle of a stored program computer. [4+4]

2. Explain briefly the programmer's model of 8085 microprocessor. [8]

3. Write a program for 8085 to add the upper and lower nibble of ten 8 bit words stored in a table that starts from location 8B20H. Store the separate results in locations just after the table. [8]

4. What do you mean by addressing mode? Explain the addressing modes of 8086 with example. [3+5]

5. Write an assembly language program to read a text from keyboard, convert the text into uppercase and display on the cleared screen. [8]

6. Draw and explain the bus timing for OUT 42H instruction of 8085 microprocessor. [8]

7. Draw the address decoding circuit to interface two RAM memory block each of 8 KB at address COOOH. [8]

8. Explain how hardware interrupt is processed in 8086 microprocessor. [8]

9. What do you mean by parallelism? Write and explain the features of a typical operating system. [8]

10. Write short notes on: [4×2]
    a) RS 232 Standard
    b) Programmable Peripheral Interface

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Subject: - Microprocessors *(EX551)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt *All* questions.
✓ The figures in the margin indicate *Full Marks*.
✓ Assume suitable data if necessary.

1. Define instruction cycle and machine cycle. Explain briefly the instruction processing cycle of Von Neumann machine. [4+4]

2. Draw the internal architecture of 8085 microprocessor and explain each part. [8]

3. Write an assembly language program for 8085. Table1 contains 16 no. of 8 bit data, transfer data which have number of 1s greater than 3, from table1 to table2, otherwise store FFH in table2. [8]

4. What is statement in assembly language programming? Explain commonly used directives with examples. [8]

5. Write a program to read a string and display only the alphabetic characters from the string in a clear screen. [8]

6. Draw timing diagram of instruction LDA 2080H. Calculate the time required to execute this instruction if the crystal frequency is 6 MHZ. [6+2]

7. Determine the capacity of devices in the following memory range. [2+6]

Range	Device
0000-1FFF	ROM
2000-3FFF	RAM1

   Design an interfacing circuit to interface above memory devices with 8085 microprocessor.

8. Define Interrupt Service Routine (ISR) and Interrupt Vector Table (IVT). Explain type 0 to type 4 interrupt of 8086. [2+6]

9. What are the features of digital signal processors? Describe instruction level, thread level and process level parallelism. [2+6]

10. Write short notes on: [4×2]

   a) I/O mapped and memory mapped I/O
   b) DMA

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INSTITUTE OF ENGINEERING
Examination Control Division
2070 Bhadra

Exam.		Regular	
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessor (EX551)

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. Define bus? Explain different types of bus. Define RTL. Write down the RTL for MOV r_1, r_2 in 8085 microprocessor.   [4+4]

2. In how many ways 8085 instructions can be classified? Explain with examples. What is the purpose of the branching instructions?   [6+2]

3. Write an assembly language program for 8085 to exchange the bits D6 and D2 of every byte of a program. Suppose there are 200 bytes in the program starting from memory location 8090H.   [8]

4. Draw internal block diagram of 8086. Explain Bus Interface Unit.   [5+3]

5. Write an assembly language program for 8086 to a read string. Display each word in separate lines in a cleared screen, count how many words are there and display the count.   [8]

6. Write the various machine cycle involved in LDA C030 stored at C050. Write the use of following pins of 8085 microprocessor. ALE, IO/M, READY, RD, AD_0-AD_7.   [3+5]

7. Explain the execution of instruction LDA 8B7FH with the help of timing diagram.   [8]

8. How interrupt vector table is used in microprocessors to manage the interrupt? Explain how software and hardware interrupts are used in 8086 microprocessor in detail.   [3+5]

9. Write the conditions that may cause deadlock to arise. Explain Flynn's classification.   [4+4]

10. Write short notes on: [4×2]

    a) Hardwired and micro program control unit
    b) EXE and COM programs

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Exam.	**New Back (2066 & Later Batch)**		
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessor *(EX551)*

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. Differentiate between Hardwired and Microprogrammed Control Unit used in microprocessors? Write the fetch and execution cycle for LXI D,9050H instruction in RTL specifications. Explain each step. [4+4]

2. Write any three features of 8085 microprocessor. Explain the addressing modes of 8085 with example. [3+5]

3. Write an assembly language program in 8085 to divide a byte stored in memory location 9070 H by byte stored in 9071 H and store the remainder and quotient at 9072 H and 9073 H respectively. [8]

4. Draw the functional block diagram of 8086 microprocessor and explain each block. [8]

5. Write a program for 8086 to find the largest and smallest value from a list of ten 16 bit data and store the result in maxval and minval variables. [8]

6. What do you mean by serial interface? Differentiate between synchronous and asynchronous serial interlacing. Describe how we can use RS-232 standard to transfer data from DTE to DCE and vice versa? [1+3+4]

7. Design the address decoding interface of an input port and output port for 8085 at 81 H and 82 H address. Use block decoder. [8]

8. Differentiate Maskable and Non-Maskable interrupt. Write the general sequence to be followed when interrupt occurs. [2+6]

9. Write down the difference of RISC and CISC computers. [8]

10. Write short notes on: [2×4]

    a) Serial and parallel interface
    b) Programmable peripheral interface

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INSTITUTE OF ENGINEERING

Examination Control Division

2069 Bhadra

Exam.	Regular (2066 & Later Batch)		
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessor (EX551)

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. Define microprocessor based system. Explain the various components of a microprocessor based system including the bus structure. [2+6]

2. Compare CALL and RET instructions with PUSH and POP instructions for 8085. Illustrate their usages with appropriate examples. [4+4]

3. Write a program to convert ten BCD numbers stored at 4350H to binary and store the result at 4360H. [8]

4. Draw the internal architecture of the 8086 microprocessor. Differentiate between EXE and COM programs. [4+4]

5. Write a program in 8086 to convert the vowels to uppercase from a string entered by the user and display the converted string in a new line. Also count the number of uppercase letters in the converted string and display the count in a new line. [8]

6. Define synchronous and asynchronous bus. Draw and explain the timing diagram of LXI B 1234H. [3+5]

7. Interface two 4K*8 ROM with 3:8 decoder at the address of your choice. Show the address map for each ROM and explain your circuit. [8]

8. Explain how the interrupt vector table is used in 8086 microprocessor. Show the complete instruction execution sequence when interrupt service routine is called. [3+5]

9. What do you mean by parallelism? Explain the case of deadlock that may arise during inter process communication. What role does the operating system play in handling such deadlocks? [2+3+3]

10. Write short notes on: (any two) [2×4]

    a) Flags in 8086 microprocessor
    b) Programmable interrupt controller (PIC)
    c) Instruction and machine cycles

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INSTITUTE OF ENGINEERING
Examination Control Division
2068 Bhadra

Exam.		Regular / Back	
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessors

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt __All__ questions.
✓ The figures in the margin indicate __Full Marks__.
✓ Assume suitable data if necessary.

1. What do you mean by stored program concept? Explain the processing cycle of stored program computer. [2+6]

2. Draw the block diagram of 8085 microprocessor and explain each part briefly. [8]

3. Write a program in 8085 to transfer 8-bit number from one table to other by setting bit D_5 if the number is less than 80H else transfer the number by resetting bit D_6. [8]

4. What do you mean by directives and instructions? Explain the frequently used directives in assembly language programming. [2+6]

5. Write a program in 8086 to read a string and count the number of vowels, consonants, numerals and other characters and display the count. [8]

6. What do you mean by synchronous and asynchronous bus? Draw the bus timing diagram for LXI B, 7492H which is stored in stored in memory location 8200H. [2+6]

7. What do you mean by unique and non-unique address decoding? Explain memory mapped I/O along with an example. [2+6]

8. How is interrupt processing different than polling? Explain how interrupt processing is done with 8085. [2+6]

9. What do you mean by real and pseudo-parallelism? Explain Flynn's classification. [3+5]

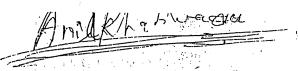10. Write short notes on [4×2=8]
    a) Stack memory
    b) USART

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Exam.		Regular / Back		
Level	BE		Full Marks	80
Programme	BEL, BEX, BCT		Pass Marks	32
Year / Part	II / II		Time	3 hrs.

Subject: - Microprocessors

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt All questions.
✓ The figures in the margin indicate Full Marks.
✓ Assume suitable data if necessary.

1. What is a system bus? Explain different types of system buses. Compare 8085 and 8086 microprocessors system bus.   [2+6+2]

2. What do you mean by an instruction? Explain different types of instructions in 8085 on the basis of function and instruction size with suitable examples.   [2+8]

3. What is a flag? Describe status and control flags of 8086 in brief. Explain how 20 bit physical address is calculated from 16 bit logical address. Give suitable examples.   [1+5+4]

4. A set of three readings is stored in memory starting at 9040H. Write an assembly language program to sort the readings in ascending order. Store the smallest value in address 9054H and so on in higher addresses.   [10]

5. Write an assembly language program to read a string from memory in data segment. Change all the upper case letters to lower case and vice versa. Display the result on the screen. [Note: ASCII code for A = 65..... Z = 90, a = 97..... z = 122]   [10]

6. In 8085, memory and I/O read/write instructions use extra machine cycle for memory and I/O read write operation. Use the bus time diagram for MOV R,M and out instructions to illustrate the statement.   [5+5]

7. What is unique and non unique address decoding, explain with suitable examples. Design an unique address decoding circuit using memory mapped I/O interface to read input from port address FFF9H and output to port address FFF8H.   [4+6]

8. Write short notes on: [2×5]

   a) RIM and SIM instructions
   b) RS 232

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Exam.		Back	
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessors

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt __All__ questions.
✓ The figures in the margin indicate __Full Marks__.
✓ Assume suitable data if necessary.

1. Explain how instructions and opcodes are designed in microprocessor? What do you mean by register transfer language? What could be the register transfer statements for ADD B.   [3+2+5]

2. Explain the following instructions in 8085 in detail with example
   SBB B, DAD B, CPO 8285, XTHL, RST 5   [10]

3. Write a program in 8085 to add all the numbers from a table of 8-bit numbers whose higher nibble value is greater than 6 and store the 16 bit result just after the table.   [10]

4. What do you mean by addressing mode? Explain different addressing modes of 8086 with example.   [2+8]

5. Write a program in 8086 to read a single digit number and display the multiplication table of that number as
   2 4 6 8 10 12 14 16 18 20 if user enters digit 2.   [10]

6. What do you understand by synchronous bus and asynchronous bus? Draw and explain the bus timing diagram when the instruction ADI 34H is executed.   [3+7]

7. Write down different ways of synchronizing peripherals with computer. Explain the interrupt processing mechanism vectored and polled interrupts.   [4+6]

8. Write short notes on   [5×2=10]
   a) Stored program concept
   b) Dynamic Memory Allocation

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Exam.	Regular/Back		
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessor

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
✓ The figures in the margin indicate **Full Marks**.
✓ Assume suitable data if necessary.

1. Explain the features of automated calculator. Differentiate von-Neumann and Harvard architecture. [3+7]

2. What do you mean by instructions? How are instructions designed? Explain different addressing modes of 8085 along with the example. [2+2+6]

3. Write a program for 8085 to add corresponding data form two table if the data from the first table is smaller than the second table else subtract data of second table from the first table. Store the result of each operation in the corresponding location of the third table. Assume each table has ten eight bit data. [10]

4. Draw the internal block diagram of the 8086 microprocessor. Explain the function of each component. [10]

5. Write an assembly language program to calculate sum of the series $1^2 \times 2^2 + 3^2 + 4^2 + \cdots$ up to ten terms and display the result. [10]

6. What do you understand by machine cycle? What are the operations that are performed by microprocessor? Draw and explain the timing diagram of STA 2050 instruction. [1+2+7]

7. What is interrupt vector table? Explain polled and vectored interrupts. [4+6]

8. Write short notes on: [2x5=10]
   a) RS232 Standard and Handshaking signals
   b) RISC

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Exam.		Regular/Back		
Level	BE	Full Marks	80	
Programme	BEL, BEX, BCT	Pass Marks	32	
Year / Part	II / II	Time	3 hrs.	

Subject: - Microprocessors

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt _All_ questions.
✓ The figures in the margin indicate _Full Marks_.
✓ Assume suitable data if necessary.

1. Differentiate microprocessors and microcontrollers. Compare 8085 and 8086 microprocessors in terms of programming models and addressing techniques. [2+6]

2. Write an assembly language program to count no. of −ve element in a data block containing 16 bytes of data; store the count at the end of the block if the count is greater than 8 otherwise store 0. [8]

3. What is flag? Describe the condition flags and control flags of 8086 briefly. Explain how 20 bit physical address is calculated from 16 bit logical addresses? [1+4+3]

4. Write an assembly language program to get a string input; count no. of vowels and display message 'even vowels' on the screen on the screen if the count is even otherwise display 'odd vowels'. [8]

5. An instruction is stored at memory location as follows: [8]

Memory Location	Hex Code
2050	3A (opcode)
2051	80
2052	20

This instruction loads the content of memory location 2080 into accumulator. Draw timing diagram of this instruction.

6. Present a complete plan to use 2 RAM chips of 16 KB each with 8085 microprocessor. [8]

7. How processor handles interrupt? Describe briefly hardware and software interrupts with example of each. [8]

8. Draw a simple block diagram of RISC and CISC architectures and describe merits and demerits of RISC and CISC computers. [8]

9. What is Asynchronous Communication? Describe RS-232A for serial communication. [2+6]

10. Write short notes on:
    a) Alternatives of semiconductor computing
    b) Memory mapped I/O and I/O mapped I/o

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Exam.		Back	
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessors

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt __All__ questions.
✓ The figures in the margin indicate __Full Marks__.
✓ Assume suitable data if necessary.

1. Draw the block diagram of 8085 microprocessor and explain different blocks. [10]

2. What is the purpose of the branching instructions? List out all the branching instructions in 8085 and explain each with example. [2+8]

3. What do you mean by statements in assembly language programming? Explain different directives used in assembly language programming. [2+8]

4. Write a program to transfer eight-bit numbers from 9080H to 9090H if bit D_5 is 1 and D_3 is 0. Otherwise transfer data by changing bit D_2 and D_6 from 1 to 0 or 0 to 1. Assume there are ten numbers. [10]

5. Write a program to generate multiplication table of five numbers stored in memory as array, store the result and display in following format. [10]

   5 10 15 20 25 30 35 40 45 50
   3 6 9 12 15 18 21 24 27 30
   ... ...

6. What is unique and non unique address decoding, explain with suitable example. Design an address decoding circuit to interface an input device with eight input switches and a LED output device at 41H and 42H respectively. [4+6]

7. Explain how interrupt is processed in microprocessor systems. Differentiate between vectored and polled interrupts. [5+5]

8. Write shot notes on: [2×5]

   a) RS232 & RS423
   b) RISC and CISC

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Exam.	Regular/Back		
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessors

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt All questions.
✓ The figures in the margin indicate Full Marks.
✓ Assume suitable data if necessary.

1. Explain the instruction processing cycle of a microprocessor, instruction format and instruction sheet. Write down the history in the development of the microprocessor.   [6+4]

2. What do you understand by looping? How can we perform looping in 8085 microprocessor, explain with example. Explain the mechanism of creating loops in creating delay loops of specified time.   [2+2+6]

3. There are two tables T1, T2 in memory having ten eight bit data in each. Write a program for 8085 to find the difference of the corresponding element of these two tables. Store the result of each operation on the corresponding element of the third table. Remember that the result should not be negative; it should be |T1 – T2|.   [10]

4. Write down the assembling linking and executing process. Explain macro assembling, one pass and two pass assemblers.   [5+5]

5. Write down an assembly language program to read a string and count the no of vowels in the string. Display the no of vowels in the string and the string without the vowels in it in a clear screen with reverse attribute.   [10]

6. What do you mean by address decoding? Differentiate between I/O mapped I/O and memory mapped I/O. Design an address decoding circuit to interface two RAM blocks and a ROM block each of 4 KB starting at address 4000H.   [2+2+6]

7. Explain the interrupt processing operation for hardware and software in 8086 microprocessor.   [10]

8. Write short notes on: [2×5]

   a) Types of memory
   b) Digital Signal Processor

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Exam.		Regular/Back	
Level	BE	Full Marks	80
Programme	BEL, BEX, BCT	Pass Marks	32
Year / Part	II / II	Time	3 hrs.

Subject: - Microprocessors

✓ Candidates are required to give their answers in their own words as far as practicable.
✓ Attempt **All** questions.
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1. Compare Harvard architecture with Von Neuman architecture. Explain which architecture 8085 microprocessor uses and how. [7+3]

2. What do you mean by stack and subroutine? What is the purpose of stack in subroutine call? Explain the concept of subroutine call and usage along with the changes in program execution sequence with a suitable example for 8085 microprocessor. [3+2+5]

3. What do you understand by addressing modes in microprocessor? Explain all the addressing modes of 8086 microprocessor with suitable example for each. [3+7]

4. Write a program for 8085 to convert and copy the lower case ASCII codes to upper case from memory location 9050H to 90A0H if any, otherwise copy as they are. Assume there are fifty codes in the source memory. [Note: ASCII Code for A=65...Z=90, a=97...z=122] [10]

5. Write an assembly language program for 8086 to read a string, count the number of vowels in the string and display the string and its vowels count in a clear screen. [10]

6. What are the different machine cycle operations of 8085 microprocessors? Write the bus timing cycle for IN and OUT instructions. [2+8]

7. What do you understand by address decoding? What are I/O mapped I/O and memory mapped I/O? Design an address decoding circuit for interfacing two RAM chips each of 256 bytes at address 5300H. [2+2+6]

8. Write short notes on: [2×5]

   a) Vectored Interrupt
   b) Dynamic Memory Allocation

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