

CBCS SCHEME

17CS44



Fourth Semester B.E. Degree Examination, Feb./Mar. 2022 Microprocessors and Microcontrollers

Time: 3 hrs.

Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

- 1 a. Draw and explain internal block diagram of 8086 CPU in detail with all register set. (10 Marks)
- b. Show the memory dump for the following data section or data segment:
·DATA
ORG 0010H
DATA1 DB 25
DATA2 DB 10001001B
DATA3 DB 12H
ORG 0020H
DATA4 DB '2591'
ORG
DATA5 DW 9, 2, 7, 0CH, 00100000B, 5
DATA6 DW 4DUP (00H) (05 Marks)
- c. Explain with an example. Why and how a 20 bit address is generated in 8086. (05 Marks)

OR

- 2 a. Explain the different addressing modes used in 8086 microprocessor with suitable example. (10 Marks)
- b. If CS = 24F6H and Ip = 634AH, find logical address, offset address, physical address, lower range and upper range of code segment. (05 Marks)
- c. Write a program that transfers a 6 bytes of data from memory location with offset of 0010H to memory locations with offset of 0028H. (05 Marks)

Module-2

- 3 a. Write a program to calculate total sum of 5 bytes of data. Each byte represents daily wages of a worker; the decimal data is as follows 125, 235, 197, 91 and 48. (06 Marks)
- b. Explain with example, how BCD number 29H is converted to ASCII numbers 32H 39H. (06 Marks)
- c. Explain the four cases of the Division with an example. (08 Marks)

OR

- 4 a. Write a program to i) Clear screen ii) Set the video mode to CGA of 640 × 200 resolution and iii) Draw Horizontal line starting at column = 100, ROW = 50 and ending at column = 200, ROW = 50. (09 Marks)
- b. Give five differences between INT and CALL instruction. (05 Marks)
- c. Find the physical and logical address in the interrupt vector table for INT 12H and INT 8. (06 Marks)

Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.
2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

Module-3

- 5 a. Explain the following instructions with an example:
 i) CBW ii) CWD iii) IDIV iv) IMUL. (08 Marks)
- b. Write a program that scans the string "Mr. Gones" and replaces the "G" with letter "J" then displays correct name. (06 Marks)
- c. With an example, explain STOS, LODS and MOVS instructions. (06 Marks)

OR

- 6 a. Assume that we have 4 bytes of hexadecimal data: 25H, 62H, 3FH, 52H.
 i) Find checksum byte.
 ii) Perform checksum operation to ensure data integrity.
 iii) If the second byte 62H had been changed to 22H, show how checksum detects the error. (04 Marks)
- b. Explain briefly the control word format of 8255 in I/O mode. Find the control word if PA = out, PB = in, PC₀ – PC₃ = in and PC₄ – PC₇ = out. Use port addresses of 300H – 303H for the 8255 chip. Then get data from port B and send it to port A. (08 Marks)
- c. Write a program to toggle all bits of Port A continuously with some delay, use INT 16H to exit if there is a key press. (08 Marks)

Module-4

- 7 a. Give differences between CISC and RISC. (05 Marks)
- b. Explain about ARM processor modes and complete registers set with neat diagram. (10 Marks)
- c. With an example explain how processor changes the mode from user mode to interrupt request mode. (05 Marks)

OR

- 8 a. Explain ARM7 three-stage pipeline with an example. (07 Marks)
- b. Explain Von-Neumann style core and Harvard style core. (08 Marks)
- c. Explain different types of memory management hardware. (05 Marks)

Module-5

- 9 a. With an example, explain the following instructions with an example:
 i) MOVN ii) LDRB iii) MUL iv) UMULL. (10 Marks)
- b. Explain the following, with an example:
 i) Multiple-Register transfer instructions
 ii) MSR and MRS instructions. (10 Marks)

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OR

- 10 a. How stack operations can be carried out using load-store multiple instructions. (06 Marks)
- b. Explain pre-index with write back and post index with an example. (08 Marks)
- c. Explain barrel shifter with suitable example. (06 Marks)
