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15CS44

Fourth Semester B.E. Degree Examination, Dec.2019/Jan.2020
Microprocessor and Micro Controller

Time: 3 hrs. Max. Marks: 80

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

Module-1

1 a. With neat internal block diagram of 8088/86 CPU, explain the working of EU and BIU. **(08 Marks)**

b. What is stack and why is it needed? **(04 Marks)**

c. Assuming that SP = 1236H, AX = 24B6H, DI = 85C2H and DX = 5F93H, with supporting diagram show the contents of the stack as each of the following instruction is executed:
PUSH AX
PUSH DI
PUSH DX **(04 Marks)**

OR

2 a. Assume that the register have the following values and that CS = 1000H, DS = 2000H, SS = 3000H, SI = 4000H, DI = 5000H, BX = 6080H, BP = 7000H, AX = 25FFH, CX = 8791H and DX = 1299H. Calculate the physical address of the memory where the operand is stored and the contents of the memory location in each of the following addressing examples:
i) MOV [SI], AL
ii) MOV [SI + BX + 8], AH
iii) MOV [DI] [BX] + 28, CX
iv) MOV [BP] [SI] + 10, DX
v) MOV [BP] + 200, AX
vi) MOVIDI + BP + 100], AX **(06 Marks)**

b. With neat diagram discus the steps to create a program. **(06 Marks)**

c. Differentiate between EXE and .COM Fite format. **(04 Marks)**

Module-2

3 a. Explain the working of following instruction along with charge in flag bits:
i) ADC ii) SBB iii) DIV iv) DAA v) CMP **(10 Marks)**

b. Write a program that calculates the total sum paid to a salesperson for eight months. The following are monthly paychecks for those months (in Rs): 2300, 4300, 1200, 3700, 1298, 4323, 5673, 986. **(06 Marks)**

OR

4 a. Write a program that:
i) Cleans the screen
ii) Set the curser at row = 8 and column = 14
iii) Displays the string "What is your Name?" **(06 Marks)**

b. With neat diagram illustrate the interrupt vector table. **(06 Marks)**

c. Write short note on the following: i) Type 0 and ii) Type 2 interrupts. **(04 Marks)**

Module-3

5 a. Write a program to find the average of following signed numbers:
+13, -10, +19, +14, -18, -9, +12, -19, +16 **(08 Marks)**

b. Assume that we have 4 bytes of data: 25H, 62H, 3FH and 52H.
i) Find the checksum byte
ii) Perform the checksum operation to ensure data integrity
iii) If the second byte 62H been changed to 22H, show how checksum detects the error. **(08 Marks)**

OR

6 a. Outline the control word format of 8255 PPI with neat diagram. **(06 Marks)**

b. Demonstrate the following with example: i) IN ii) OUT. **(04 Marks)**

c. Find the control word if Port A = out, Port B = in, Port C (lower) = in and Port C (upper) = out. Program the 8255 to get data from Port A and send it to Port B. In addition data from Port C (lower) is sent out to the Port C (upper). Use port addresses of 300H-303H for the 8255 chip. **(06 Marks)**

Module-4

7 a. Distinguish between micro processor and microcontroller. **(05 Marks)**

b. With supporting diagram demonstrate the RISC design philosophy. **(05 Marks)**

c. Explain the memory remapping of embedded system software for initialization (Boot) code. **(06 Marks)**

OR

8 a. Explain with neat diagram, ARM core dataflow model. **(08 Marks)**

b. With neat diagram illustrate the seven processor modes. **(08 Marks)**

Module-5

9 a. Demonstrate the working of barrel shifter with help of example. **(06 Marks)**

b. Illustrate the following instruction with an example:
i) RSB ii) SUB iii) EOR iv) CMN v) TST. **(10 Marks)**

OR

10 a. Write ARM assembly language program for data transfer, arithmetic and logical operation. **(08 Marks)**

b. Demonstrate the following load-store instructions:
i) LDR r0, [r1, #4]!
ii) LDR r0, [r1, #4]
iii) LDR r0, [r1], #4 **(08 Marks)**

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