

Jadavpur University
B.Power Engg.3rd Year 2nd Semester Examination 2022
Microprocessors & Microcontrollers

Time: 3hrs
Full Marks 100

Answer All Questions

1. Evaluate the following using signed binary arithmetic :
 - $(210)_{10} + (22)_{10}$
 - $(128)_{10} - (42)_{10}$
 - $(220.25)_{10} + (12.50)_2$
 - $(11)_{10} \times (12)_{10}$

20 CO(1)

OR

Express (256.28) in 6Byte (M,E) format with 4 Bytes for Mantissa and 2 for Exponents expressed in Hexadecimal Code. 20 CO(1)
2. Express the functioning of a Full Adder with Carry using a Moore Machine 20 CO(2)

OR

Deduce the circuit for a 3 bit up counter using T Flip Flops and an FSM 20 CO(2)
3. Write an assembly level program for a 8085 Microprocessor to do the following, assuming:
 - (i) The Memory Location 2020H contains 22H
 - (ii) The Memory Location 2021H contains 46H

Load the Accumulator with 28H
Move the contents of Memory Location 2020H to B
Move the contents of Memory Location 2021H to C
Add the contents of B and C to the contents of the Accumulator
Store the result in location 2030H
Deduce the status of the Carry Flags when you add the result of addition of B and C registers to the content of the Accumulator. 20 CO(3)

OR

Write an assembly level program to sort 10 consecutive numbers stored in locations starting from 2020H in ascending order and store the sorted result in 10 consecutive locations starting from 2040H 20 CO (3)
4. Draw the Timing Diagram for a Typical RD Cycle in an 8085 Microprocessor.
Design a Memory System with Address Decoding Logic for an 8085 Microprocessor for a 64K Memory System with 8K×1 Memory Chips. 10 +10 CO(4)
5. Which direction does the stack increase in an 8085 Microprocessor and why? 5
Explain what the following code does and show the stack frame (contents of the stack with stack pointer) after each instruction.
 - LXI H, 8000H
 - SPHL
 - LXI H, 1234H
 - PUSH H
 - POP D
 - HLT

What is the content of DE register pair after the code is executed? 15 CO(4)