

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)**

**CLASS: BE
BRANCH: ECE**

**SEMESTER: IV
SESSION : SP/2019**

SUBJECT : EC4205 MICROPROCESSORS AND MICROCONTROLLERS

TIME: 1.5 HOURS

FULL MARKS: 25

INSTRUCTIONS:

1. The total marks of the questions are 30.
 2. Candidates may attempt for all 30 marks.
 3. In those cases where the marks obtained exceed 25 marks, the excess will be ignored.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. The missing data, if any, may be assumed suitably.
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- Q1 (a) Why all the registers connected to W bus in SAP-1 shall be Tri-state enabled? [2]
(b) Differentiate between Hardware Control Matrix and Software Control Matrix, mentioning the relative merits and demerits. Give an example of Software Control Matrix technique. [3]
- Q2 (a) Explain the functions of WZ register pair in 8085 Architecture, mentioning at least four examples of instructions where they are used. [2]
(b) What is meant by Folded Memory in a Minimum System? Why and how it has to be avoided in a reliable Microprocessor based system? [3]
- Q3 (a) Write a subroutine to generate a Time delay of 9 microseconds, assuming the Clock frequency is 2 Mega Hertz. [2]
(b) A string of 36 bytes are residing in locations starting from ARRAY. Write an 8085 based program to select only the odd bytes among them and add them together and keep the sum in 2 locations starting from ODDSUM and also to keep the count (in BCD) of added bytes in ODDCOUNT. [3]
- Q4 (a) What does an XTHL instruction do? Demonstrate its utility with a sample program. [2]
(b) A string of bytes resides in locations starting from STRING and ends with a Carriage Return ODH. Write an 8085 based program to count the number of bytes in the string(excluding ODH) and store the count (in BCD) in location STRINGCOUNT. [3]
- Q5 (a) What are the two purposes for which a RIM instruction is used? [2]
(b) Assume data bits are arriving at a synchronous rate of 250 bits per second at SID pin of an 8085, with MS bit first and LS bit last. Write a program to input 240 bytes of data through the SID pin and store them in locations starting from DATA. Before starting the inputting of bytes, send a Start Transmit positive pulse of duration 9 microseconds to the external input device through the SOD pin. Assume that the required Time delay routines are available. [3]
- Q6 (a) Differentiate between Vectored Calls and Vectored Interrupts. Also mention why they are termed Vectored. [2]
(b) A rain sensor output is connected to the RST 7.5 interrupt pin of an 8085 and the wiper motor is controlled by the SOD pin of the same 8085. Write a program to start the wiper after 3 seconds of rain detection by sending a high signal of 5 volts through the SOD pin and stop it after 1 minute by sending a 0 volt through the SOD pin. Assume that all the required Time delay routines are available. [3]

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