

2024

COMPUTER SCIENCE — HONOURS — PRACTICAL

Paper : DSE-A-3P

(Embedded Systems)

Full Marks : 30

The figures in the margin indicate full marks.

Set - I

Marks Distribution :

Theory/Algorithm/Circuit/Flowchart	:	04
Programming using Embedded C/ Assembly Language Program for 8051/VHDL Program/Code	:	11
Output	:	03
Discussion	:	02
Assignment/Laboratory Notebook	:	05
Viva	:	05

Answer *any one* question.

1. Write the VHDL Code for implementation of half subtractor, using basic Logic gates. 20
2. Write the VHDL Code for implementation of full subtractor, using basic Logic gates. 20
3. Write the VHDL Code for implementation of 3-bit up counter. 20

(2)

B(6th Sm.)-Computer Sc.-H/Pr./DSE-A-3P/CBCS/Set-I

4. Write the VHDL Code for implementation of 8 to 1 multiplexer using two 4 to 1 multiplexers and necessary Logic gates. 20

 5. Write an Assembly Language or Embedded C Program for 8051 (MCS-51) to calculate the average of sixteen odd 8-bit numbers. 20

 6. Write an Assembly Language or Embedded C Program for 8051 (MCS-51) to Multiply two unsigned 8-bit numbers 22H and 13H. Store the result in a suitable user accessible memory location and subtract 33H from the result. 20

 7. Write an Assembly Language or Embedded C Program for 8051(MCS-51) to copy a block of twenty data from one section of user data memory to another in the internal RAM. 20

 8. Write an Assembly Language or Embedded C Program for 8051(MCS-51) to shift a block of 10 bytes of data, presently located from 50H to 59H, 1-byte up, so that the data is available from 51H to 5AH. 20

 9. Write an Assembly Language or Embedded C Program for 8051(MCS-51) to count the number of zeros and number of odd number data stored between the memory locations 60H to 6FH. The total number of null or zero data to be stored in the location 70H and total number of even data to be stored in the location 71H. Take at least 3 different sets of array of data. 20

 10. Write an Assembly Language or Embedded C Program for 8051(MCS-51) to count even and odd numbers in an array of ten 8-bit numbers stored in the internal RAM. Choose suitable memory locations to store the results. 20
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Full Marks : 30

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Set - II

Marks Distribution :

Theory/Algorithm/Circuit/Flowchart	:	04
Programming using Embedded C/ Assembly Language Program for 8051/VHDL Program/Code	:	11
Output	:	03
Discussion	:	02
Assignment/Laboratory Notebook	:	05
Viva	:	05

Answer *any one* question.

1. Write the VHDL Code for implementation of half adder designed using Universal gates. 20
2. Write the VHDL Code for implementation of 4 to 1 multiplexer designed using basic Logic gates. 20
3. Write the VHDL Code for implementation of full adder using basic Logic gates. 20

4. Write the VHDL Code for implementation of JK flip-flop. 20
5. Write an Assembly Language or Embedded C Program for 8051(MCS-51) to generate AP series when number of terms, common difference and first term is available. 20
6. Sixteen consecutive bytes starting from 50H have unsigned integers. Write an Assembly Language or Embedded C Program for 8051(MCS-51) to add all these sixteen 8-bit numbers and store the sum in suitable memory location. 20
7. Develop an Assembly Language or Embedded C Program for 8051 (MCS-51) to compute and store a Fibonacci series up to N terms starting from memory location 50H. Assume N is stored at address 4FH, with N greater than 3 and generate multiple Fibonacci series for various values of N, each not exceeding 10 terms. 20
8. Write an Assembly Language or Embedded C Program for 8051 (MCS-51) to count the number of those bytes, which contain 00H from an array of twenty bytes of data stored in location from and between 6CH to 7FH of internal RAM. Store the number of null bytes in RAM location 6BH. 20
9. Write an Assembly Language or Embedded C Program for 8051(MCS-51) to sort an array containing sixteen 8-bit numbers in ascending order using bubble sort. 20
10. Write an Assembly Language Program/8051 C program to find the largest and smallest from N unsigned integers. Assume the value of N to be available in the internal data memory location at 40H. The array starts from location 41H. Store the maximum integer in R7 and minimum in R6 use the register bank #0. 20
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