2023

COMPUTER SCIENCE — HONOURS — PRACTICAL

Paper : CC-5P

(Computer Organization Lab)

Full Marks : 30

The figures in the margin indicate full marks.

Marks Distribution

Experiment total	: 20
Theory + Problem design	: 05
Implementation	: 10
Output	: 03
Discussion/Conclusion	: 02
Viva voce	: 06
Lab notebook	: 04

SET - 2

Answer *any one* question.

1. Design a logical unit capable of performing the following operation :

Selection		Function
S_1	S_0	Y
0	0	ANDing
0	1	ORing
1	0	XORing
1	1	Complement

Comparison is to be made beween 2 sets of 2-bit numbers ($A_1 A_0$ and $B_1 B_0$). Show at least 1 set of output for each function. 20

2. Design a circuit capable of performing 4-bit addition and 2's complement subtraction (inputs need not be in BCD form and hence correction is not mandatory). Take at least 3 sets of data. 20

3. Design a full adder using IC 74138, and verify the outputs using LED's, also record the output logic voltage levels. 20

4. Construct a 4-bit synchronous counter. using JK or D flip-flops. Use de-bouncer circuit as manual clock. 20

5. Design 2-bit bidirectional shift register. (control $\bar{R}/L$). De-bouncer circuit to be used as manual clock. Take at least 3 sets of data. 20

6. Convert Gray to Binary code using RAM IC 7489/74189. Take at least 4 sets of data. 20

7. Construct a 2-bit universal shift register using D flip-flop (7474) and 4 to 1 multiplexer (74153) with other necessary logic gates. Use a de-bouncer circuit as manual clock. 20

8. Design a 16×8 memory module using necessary logic gates and RAM IC 7489/74189. 20

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