

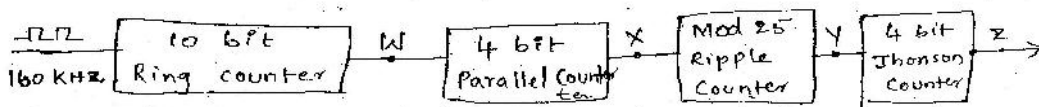
FACULTY OF ENGINEERING**B.E. 3/4 (ECE) I – Semester (New) (Suppl) Examination, May 2013****Subject : Digital Integrated Circuits and Applications****Time : 3 hours****Max. Marks : 75****Note: Answer all questions from Part-A and answer any FIVE questions from Part-B.****PART – A (25 Marks)**

1. Draw the circuit of three input TTL NAND gate. 2
2. Write the description of 3
 i) 74 HC 00 ii) 74 ALS 86 iii) 74 LS 83 iv) 74 S 85
3. Write any two advantages and disadvantages of CMOS logic. 2
4. Explain briefly about the function generator using ROM. 3
5. Implement the Demultiplexer by using 74ALS138. 2
6. Classify the types of seven segment displays and write the importance of LT, BI/RBO, RBI inputs. 3
7. Implement the sum & carry outputs of a full adder using 4 : 1 MUX. 3
8. Draw the mod 8 asynchronous down counter and draw its timing diagram. 3
9. A certain memory is specified as 4K x 32. How many words can be stored on the chip and what is the capacity of the memory system? 2
10. Define the term mask-programmable and give an example. 2

PART – B (50 Marks)

- 11.a) A two input NAND gate has $V_{cc} = +5v$ and 1 K Ω load connected to its output. Calculate the output voltage i) when both inputs are low ii) when both inputs are HIGH. 5
- b) Explain IC interfacing techniques for CMOS to TTL logic families and TTL to CMOS logic families. 5
- 12.a) Draw the circuit diagram of a 2 input ECL NOR/OR gate and explain its operation with the truth tables. 5
- b) Compare the following technologies. 5
 i) TTL and CMOS ii) TTL and ECL
- 13.a) Explain the operation of 3 bit presettable counter and the operation of 74 LS 193 Counter. 5
- b) Draw the circuit of IC 74 HC 4511 drives an LCD display and explain its operation. 5

- 14.a) Explain parallel, serial and carry look ahead adder with its circuit diagrams. 5
- b) Realise the binary subtractor with 2's complement circuit with 74 LS 83 to get the true magnitude output for all combinations. 5
- 15.a) Compare PAL, PROM and PLA with the help of block schematics and explain the respective advantages. 5
- b) Implement the following functions by using PROM, PLA, PAL 5
- $$f_1(a, b, c) = \sum m(0, 1, 3, 6, 7)$$
- $$f_2(a, b, c) = \sum m(2, 3, 4, 5)$$
- $$f_3(a, b, c) = \sum m(0, 1, 2, 3, 4, 5, 6, 7)$$
- 16.a) Determine the frequency of pulses at points w, x, y, and z in the circuit. 5



- b) Design a relay type sequence detector to detect a serial input sequence of 101. 5
17. Write a short notes on any two of the following : 5
- b) Expanding word size and capacity 5
- c) Johnson and Ring counters 5
