

**Digital Electronics**  
**(EC-205, DEC-2005)**

**Note:** Section A is compulsory. Attempt any four questions from Section B and any two questions from Section C.

**Section-A**

- a) What is Excess-3 and Gray code?
- b) Why ASCII-code is a 7-bit code?
- c) Add  $(7F)_{16}$  &  $(BA)_{16}$ .
- d) Differentiate between half and full subtractors.
- e) Compare a decoder with a demultiplexer.
- f) What is meant by a state diagram?
- g) What is meant by 'accuracy' of an A/D/converter?
- h) Difference between PLA and ROM?
- i) Explain the problem of 'current hogging' in DCTL.
- j) Explain the operation of CMOS(NOR gate).

**Section-B**

2. Represent the following decimal numbers in two's complement format:  
i) +3                  ii) +25                  iii) -5                  iv) -11                  v) -9
3. Write the full name in :a) ASCII code    b) EBCDIC code    c) Excess -3 code
4. Minimize the following function and realize using minimum no of gates:  
 $f_1 = \sum m(0,3,5,6,9,10,12,15)$
5. Design a BCD to Excess-3 code converter using minimum no of NAND gates
6. Design a four bit subtractor using four bit adder and minimum no of EX-OR gates.

**Section-C**

7. Obtain the output wave forms of a 5-stage ring-counter. Draw its state diagram
8. Explain the following codes and give example using four bits.  
a) CSB                  b) COB    c) CTC                  d) CCD
9. Explain & compare the following with its block diagram.  
a) Linear selection addressing  
b) Coincidence selection addressing

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