Digital Electronics
(EC-204, Dec-07)

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

Section-A

1. a) The need of study octal & hexahedral system, when the digital machine understands only binary code.
   b) Where do we use ASCII, Excess-3 & Grey codes?
   c) How many select lines are there for a 30 to 1 MUX?
   d) Difference between combinational & sequential circuits.
   e) Features of content addressable memories.
   f) What is the Mod of 6 bit Ring Counter?
   g) List the various types of A/D converters.
   h) Where do we use PLA's?
   i) What are the various type of parity checkers and where do we use them?
   j) Convert decimal 27.125 to octal.

Section-B

2. If A = 1101 and B = 101 find

$$\left.\begin{array}{l}(i)\,A+B \\ (ii)\,A-B \\ (iii)\,B-A \\ (iv)\,A x B\end{array}\right\}\text{ by 2'S complement method}$$

3. Discuss the comparison of the important features of various IC logic families.
4. Draw the circuit of an S-R flipflop using NAND gates. Modify it to include clock. Derive J-K circuit from S-R flipflop circuit & explain its truth table.
5. (i) Make a K-map for the function:

   $f = AB + A\overline{C} + C + AD + A\overline{B}C + ABC$

   (ii) Express f in standard SOP form
   (iii) Minimize it and realize the minimized expression using NAND gates only.
6. Draw the circuit of a counter type A/D converter and explain its operation.

Section-C

7. Draw the circuit of Totem pole NAND gate and explain its operation. Explain why these cannot be wire ANDed?
8. (a) What are the various type of ROM's? Discuss their relative advantages and disadvantages.
   (b) Draw the circuit of a static MOS RAM cell and explain its operation of Read and Write.
9. Write notes on any two of the followings:-
   (a) Binary ladder D/A converter.
   (b) 4 bit binary shift register
   (c) 3 bit binary magnitude comparator