

B.Tech Degree III Semester (Special Supplementary) Examination
September 2004

IT 304 ELECTRONIC CIRCUITS & LOGIC DESIGN

(2002 Admissions)

Time: 3 Hours

Maximum Marks: 100

- I. (a) Derive the expression for voltage gain at low and mid frequencies of a CE amplifier. (5)
 (b) What are the merits and drawbacks of negative feedback? (5)
 (c) Explain the classification of power amplifier based on the method of operation. (5)
 (d) Draw and explain the characteristics of FET. (5)
- OR
- II. (a) Draw the circuit diagram of a class B transformer coupled push-pull amplifier and explain its operation. (8)
 (b) Bring out the concept of feedback. Distinguish positive feedback from negative feedback. (7)
 (c) Explain the construction of FET. (5)
- III. (a) Draw a clamping circuit and explain its operation. (6)
 (b) What are the characteristics of an ideal OPAMP? (5)
 (c) What is CMRR? How can it be obtained experimentally? (9)
- OR
- IV. (a) Draw the diagram of a clipping circuit and explain its operation. (6)
 (b) Define and explain the following terms :
 (i) CMRR (ii) input offset voltage
 (iii) slew rate (iv) common mode gain (8)
 (c) Draw the circuit of a differentiator and derive the expression for its output. (6)
- V. (a) Obtain the excess-3 code and Gray code for the decimal numbers 43 and 295. (8)
 (b) For the logic equation -

$$f = A\bar{B}D + \bar{A}BC + \bar{B}\bar{C}D$$

 (i) Make a truth table
 (ii) Simplify using K-map
 (iii) Realize using NAND gates. (12)
- OR
- VI. (a) Minimize the function,

$$f = \sum m(1, 4, 6, 9, 10, 11, 14, 15)$$
 (10)
 (b) Design a full adder using NAND gates only. (10)
- VII. (a) Draw the circuit of a ECL NOR gate. (5)
 (b) Bring out the difference between TTL and ECL logic circuits. (5)
 (c) With waveforms and circuit explain the operation of an asynchronous 4 bit counter. (10)
- OR
- VIII. (a) Compare TTL and CMOS logic families. (5)
 (b) With wave forms and truth tables explain the following flip flops :
 (i) RS flip-flop and (ii) JK flip flop. (10)
 (c) Write short notes on Ring counter. (5)
- IX. (a) With logic diagram explain a 4 : 1 multiplexer. (10)
 (b) Draw the circuit diagram of ROM and explain how data is permanently stored in it. (10)
- OR
- X. (a) Draw the logic diagram of 1 : 4 demultiplexes and explain its operation with truth table. (10)
 (b) Write short notes on :
 (i) Programmable logic arrays. (5)
 (ii) MOSRAMs (5)

