B.Tech. Degree III Semester Examination
November 2004

IT 304 ELECTRONIC CIRCUITS & LOGIC DESIGN
(2002 Admissions onwards)

Time: 3 Hours   Maximum Marks: 100

I.   (a)   Draw the h-parameter model of BJT in CE configuration and derive the expression for current gain, voltage gain, input and output impedance. (10)
     (b)   Draw the high frequency model of BJT in CE configuration and explain. (4)
     (c)   Explain the working of RC phase shift oscillator. (6)

OR

II. (a)   Draw a class B power amplifier using BJTs and explain its operation. What is the drawback of this amplifier? How is the circuit modified to eliminate them? (10)
     (b)   Compare negative and positive feedback. (4)
     (c)   Explain with circuit diagrams a typical class AB pushpull amplifier. (6)

III. (a)   Draw the basic differential amplifier using BJT and derive the expression for its voltage gain. What is done to increase CMRR? Draw the transfer characteristics and explain. (10)
     (b)   Explain the differentiating ckt. Draw the output waveform for a square input. (4)
     (c)   Describe the working of clamping circuit with sinusoidal input. (6)

OR

IV. (a)   Explain differentiation and integration using RC circuits. (6)
     (b)   Explain with circuits one application of UJT. (5)
     (c)   Explain the Drift and offset problems of op-amp. (9)

V.   (a)   Realise after simplification using K-map method by NOR gate.
           $$Y = \Sigma_m(7, \ 9, \ 10, \ 11, \ 12, \ 13, \ 14, \ 15)$$ (8)
     (b)   Realise the logic functions using NAND gate and NOR gate. (6)
     (c)   Explain with necessary diagrams the full subtractor and half subtractor. (6)

OR

VI. (a)   Explain the binary multiplication process with examples. (8)
     (b)   Explain the following:
           (i)   ASCII code
           (ii)   EBCDIC code
           (iii) Grey code (6)
     (c)   Explain the X-OR gate. Realize it by using NAND gate. (6)

VII. (a)   Draw the circuit of ECL and explain. (8)
     (b)   Explain the purpose of the totem pole output stage used in a TTL gate. (6)
     (c)   Explain J – K flip flop. How it can be converted into a D-flip flop. (6)

OR

VIII. (a) Explain the working of a serial in serial out shift register with logic diagram and waveforms. (12)
     (b)   How S – R flip-flop can be converted into a D flip-flop? (4)
     (c)   What is a tristate gate? Explain it. (4)

IX. (a)   How memory can be classified? Explain it. (10)
     (b)   Differentiate between multiplexer and demultiplexer. (10)

OR

X.   (a)   Draw the block diagram of PLA and explain it. What are the applications of PLAs? (10)
     (b)   Explain Decoder and encoder. (10)