B.Tech Degree III Semester Examination
November 2005

CS 305 ELECTRONIC CIRCUITS
(Common for 1999 and 2002 Admissions)

Time : 3 Hours   Max. Marks:100

I   a) Compare the basic configurations of an NPN transistor with necessary diagrams.   (8)
    b) Distinguish between avalanche and zener breakdown.   (6)
    c) Describe the basic modes of operation of MOSFET.   (6)

OR

II a) With neat diagram explain the working of JFET. Draw the transfer characteristics also.   (8)
    b) Compare FET and BJT.   (6)
    c) Explain base width modulation in a transistor.   (6)

III a) Determine V_{CE} and I_C for the given circuit.

(10)
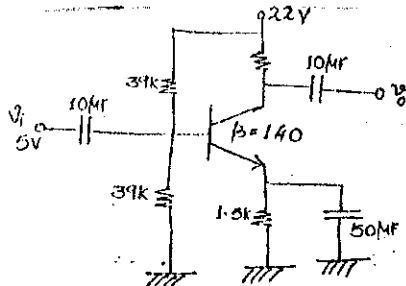
    b) Draw the frequency response of a CE amplifier and explain how gain is reduced at
       same points with necessary mathematical expressions.   (10)

OR

IV a) Why do we fix the operating point at the centre of active region in the load line?
       What is Thermal runaway?   (8)
    b) i.   Draw the small signal equivalent of CE transistor amplifier.
       ii.   Derive the expressions for voltage and current gain of CE amplifier by
             using h parameters.   (12)

V   a) Explain the various feed back topologies in amplifiers.   (12)
    b) Explain with neat diagram the working of a monostable multivibrator. Draw the
       relevant waveforms.   (8)

OR

VI a) Derive the expression for the output of an integrating circuit. What will be the
       output if a 10V p-p square wave is fed to the input of an integrator?   (8)
    b) What will be the output of the circuit shown below. Explain its working.

(6)
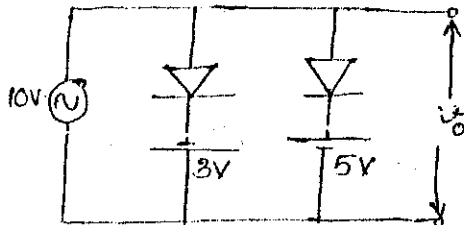
    c) How transistor acts a s a switch? With neat diagram and mathematical expression
       explain its working.   (6)

VII a) Explain the principle of an oscillator. With neat diagram explain how oscillations are
       developed in an LC circuit.   (8)
    b) Explain harmonic and cross over distortion in a power amplifier.   (8)
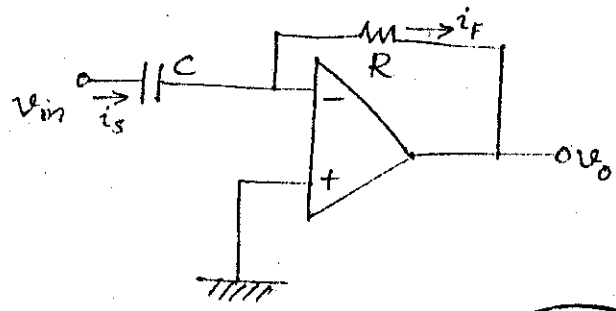   c) Write note on heat sinks.   (4)

OR

VIII	a)	Compare Class A, Class B and Class C amplifiers.	(12)
	b)	Draw the circuit of any audio frequency oscillator.	(4)
	c)	Write notes on complementary symmetry push pull amplifiers.	(4)

IX a) Explain the terms for an operational amplifier:

i)	CMRR	ii)	Slew rate	
iii)	Current mirror	iv)	Output offset voltage	(10)

	b)	What are the ideal characteristics of an op-amp.	(6)
	c)	Draw the circuit of a second order low pass filter.	(4)

<p align="center">OR</p>

X	a)	Derive the voltage gain for inverting and non inverting amplifier.	(10)
	b)	Draw the circuit diagram of a function generator using op amps; using which sine wave, square wave and triangular wave can be generated.	(5)
	c)	Derive the expression for the output of the following circuit.	(5)

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