BTS (C) 027 (C)

B.Tech. Degree III Semester Examination
January 2002

CS 305 ELECTRONIC CIRCUITS

Time: 3 Hours Maximum Marks: 100

MODULE - I

I. (a) Draw and explain the V I characteristics of p - n diode under forward and reverse bias conditions. (10)

(b) Explain the breakdown mechanisms in p - n diodes. (10)

OR

II. Using the low frequency h-parameter model of a bipolar junction transistor, analyse a common emitter amplifier so as to obtain expression for-

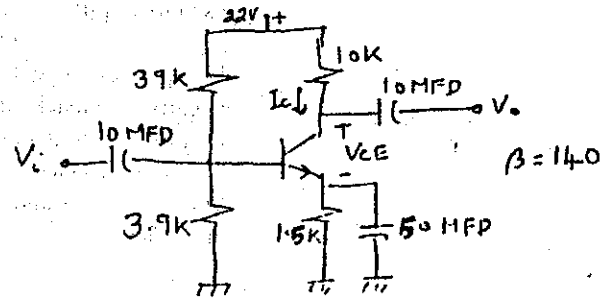
(i) the current gain (ii) input impedance

(iii) voltage gain (iv) output impedance. (20)

MODULE - II

III. (a) Describe a voltage divider bias for a BJT. (10)

(b) Determine the dc bias voltage V_{CE} and the current I_C for the voltage-divider configurations. (10)



OR

(Turn over)

IV. (a) Draw the circuit of an RC coupled amplifier and determine its -

(i) input impedance,

(ii) voltage gain,

(iii) output impedance. (15)

(b) The input power to a device is 10,000W at a voltage of 1000V. The output power is 500W while the output impedance is 20Ω.

(i) Find the power gain in decibels.

(ii) Find the voltage gain in decibels. (5)

MODULE - III

V. (i) Draw the circuit diagram of a two stage RC coupled amplifier using transistors.
(ii) Give the typical values of the components used.
(iii) Explain why RC coupled amplifier circuits cannot be used to amplify slowly varying dc signals. (20)

OR

VI. Draw the block representation of the four types of negative feedback circuits. Which one of these types is employed to get greater input impedance and lower output impedance in an amplifier circuit.
State the merits and demerits of negative feedback in amplifiers. (20)

Contd.....3.

MODULE - IV

VII. Explain the difference between a voltage amplifier and a power amplifier.
Explain the following terms in connection with power amplifiers:

(i) Collector circuit efficiency

(ii) Collector dissipation rating

(iii) Class A, Class B and Class C operation

(iv) Harmonic distortion. (20)

OR

VIII. State the condition under which a feedback amplifier work as an oscillator.
Explain the meaning of the terms:

(i) Damping oscillations,

(ii) Growing oscillations, and

(iii) Sustained oscillations.

Explain why an LC tank circuit, once excited, does not produce sustained oscillations. (20)

MODULE - V

IX. With circuit diagrams explain common mode operation and difference mode operation.
With circuit diagram and waveforms at each point explain a precision rectifier. (20)

OR

X. What are the characteristics of an ideal op-amp?
Derive the gain for an inverting and non-inverting amplifier using op-amps. (20)

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