[This question paper contains 4 printed pages.]

Sr. No. of Question Paper : 2049 **GC-3** **Your Roll No.....**

Unique Paper Code : 32511301

Name of the Paper : Electronics Circuits

Name of the Course : **B.Sc. Hons Electronics (CBCS)**

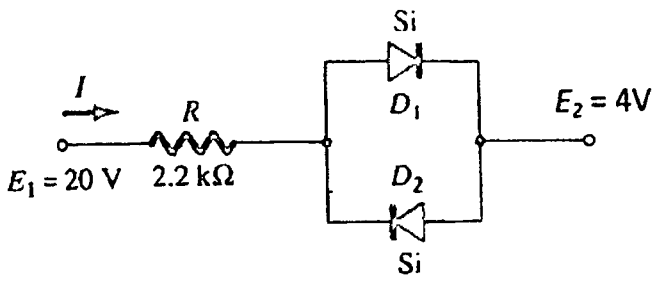
Semester : III

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on the receipt of this question paper.
2. Attempt **FIVE** questions in all.
3. Question No. **1** is compulsory.
4. **All** questions carry equal marks.
5. Use of Scientific non-programmable calculators is allowed.

1. (a) Determine the current I in the circuit shown below (3)



(b) Why is the Zener diode known as a Voltage Regulator ? (3)

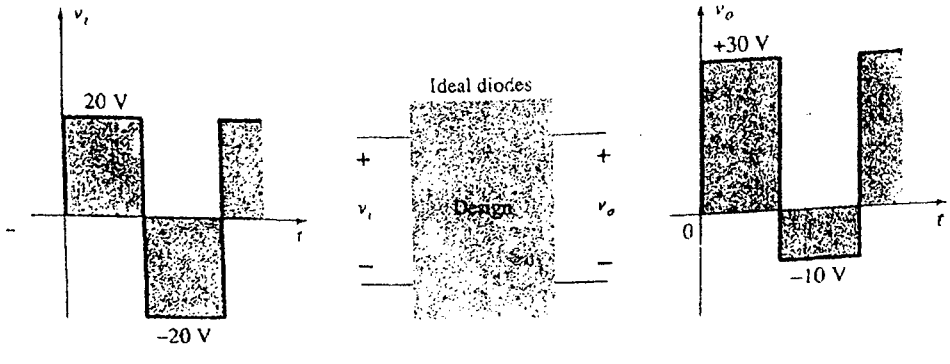
P.T.O.

(c) Why is the voltage gain of an amplifier with negative feedback smaller than with no feedback ? (3)

(d) What is Barkhausen criterion of oscillations ? (3)

(e) What do you mean by Cross over distortion in a Class B amplifier ? (3)

2. (a) The output voltage waveform (v_0) for the network for the given input, is shown below. Design a clamper circuit to perform the function. (4)



(b) Explain the working of a Full Wave Rectifier Circuit and derive the expression of ripple factor and efficiency. (7)

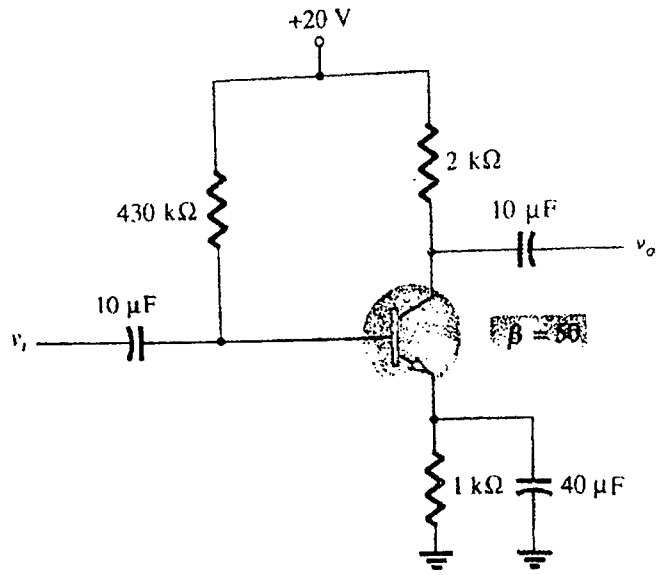
(c) For a Regulated power supply, what do you mean by the following terms ?

(i) Line Regulation

(ii) Load Regulation (4)

3. (a) Explain the difference between DC ladline and AC ladline. Why it is necessary to draw AC ladline for calculating the voltage gain of the amplifier ? (5)

(b) For the given circuit, Find I_B, I_C, V_B, V_{BC} and V_{CE}. (5)



(c) Derive h-parameters for the Common-Emitter Transistor configuration. (5)

4. (a) What is thermal runaway ? What is the importance of heat sink ? (4)

(b) Derive the expression of Low-frequency voltage gain and mid-frequency voltage gain for an RC coupled amplifier circuit. Draw the frequency response curve for RC coupled amplifier circuit. (8)

(c) The overall voltage gain of a two stage RC coupled amplifier is 80dB, if the voltage gain of the first stage is 150, calculate the voltage gain of the second stage in dB. (3)

5. (a) What is degenerative and regenerative feedback ? (3)

(b) Draw the circuit diagram of a transistorized RC phase shift oscillator and derive the expression of frequency of oscillation for the same. (8)

(c) For a Colpitt's oscillator circuit, find the value of inductor if the frequency of oscillation is 100MHz and $C_1 = C_2 = 10pF$. (4)

P.T.O.

6. (a) What type of negative feedback increases input resistance and decreases output resistance ? (2)

(b) Derive the expression of input resistance, output resistance, voltage gain and current gain for a Current-Shunt feedback circuit. (9)

(c) Derive the expression of gain of a Common-Source MOSFET amplifier circuit. (4)

7. (a) What is the difference between voltage amplifier and power amplifier ? (3)

(b) Draw the circuit diagram of a push-pull amplifier and explain its working. (8)

(c) Calculate the harmonic distortion components for an output signal having fundamental amplitude of 2.1V, second harmonic amplitude of 0.3 V and third harmonic component of 0.1V and fourth harmonic component of 0.05 V. (4)