Sem-III EXTC (CBGS) 12/5/16.

Analog Electronics-I

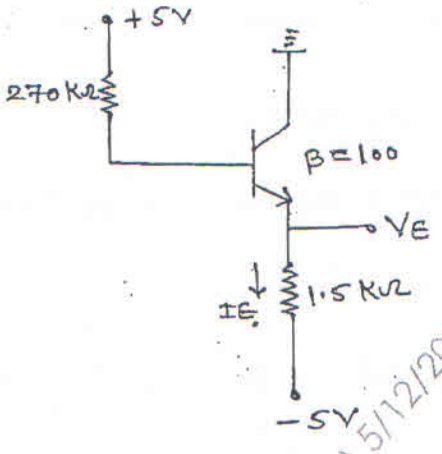
QP Code : 30569

(3 Hours) **[Total Marks : 80**

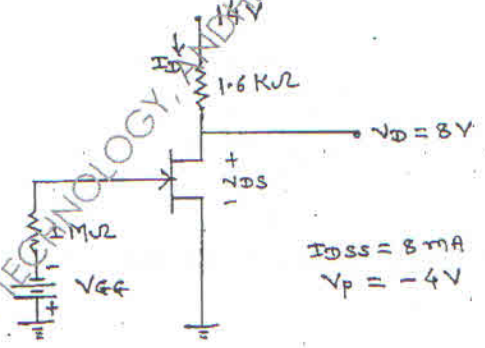
N.B. : (1) Question No. 1 is compulsory.
(2) Attempt any three questions out of remaining five questions.
(3) Assume suitable data if required and mention the same in answer sheet.

1. Attempt **any five** questions :- 20

(a) Find V_E and I_E for the circuit given below.



(b) For the circuit given below find I_D, V_{DS}, V_{GG}



(c) Write down current equation of diode and explain significance of each parameters.

(d) Explain the concept of thermal runaway in BJT.

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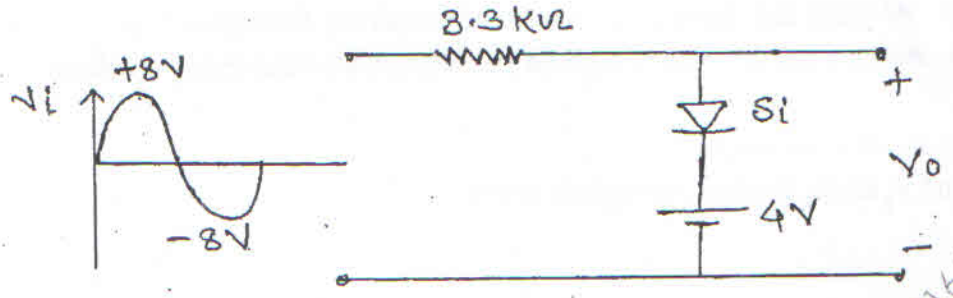
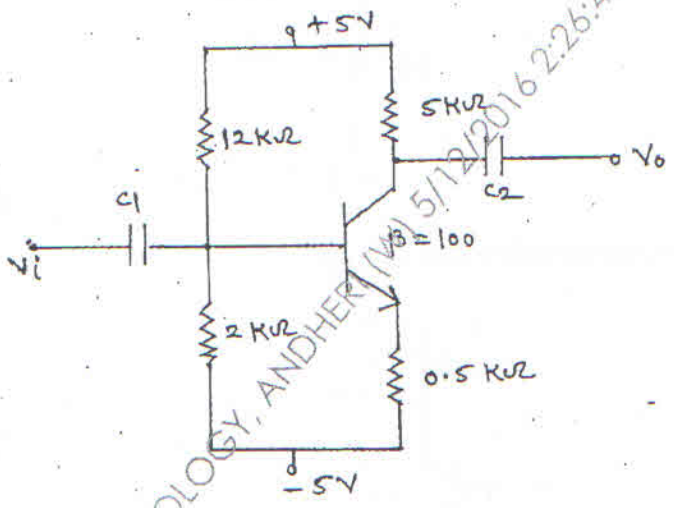
(e) Draw the output Waveform Vo for circuit shown.



(f) State and explain Barkhausen's criteria for oscillations.

2. (a) Determine Q-Print and draw d.c. load line for the amplifier shown. 10

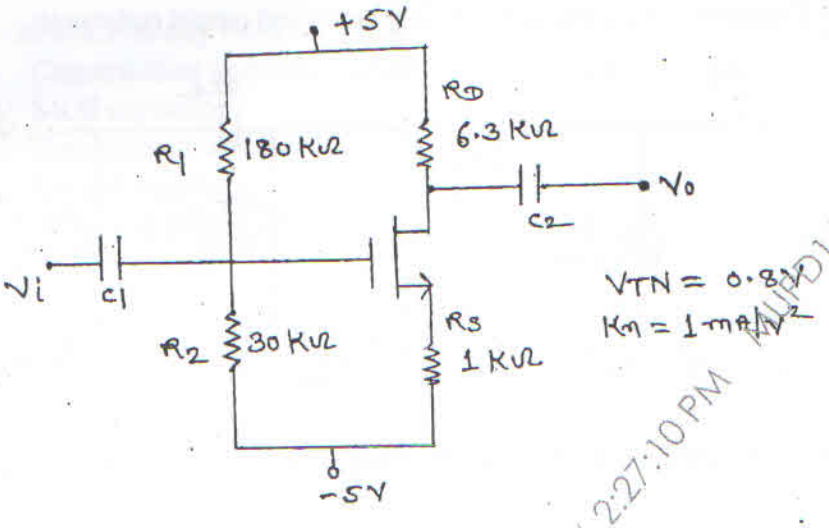


(b) Derive the expression for frequency of oscillation for a BJT RC phase shift oscillator. 10

Sem III EXTC (CBGS)
Analog Ele

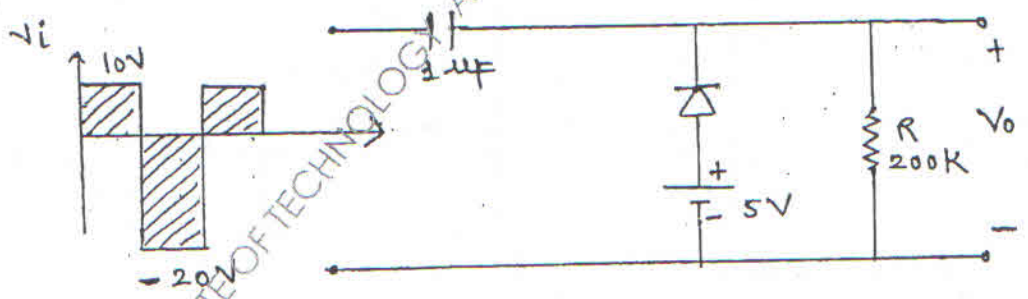
QP Code : **30569**

3. (a) Determine voltage gain, Input resistance and output resistance for the MOSFET amplifier shown. **10**



(b) Explain the working and characteristics of n-channel Junction Field Effect Transiators (JFET) **10**

4. (a) Draw the output waveform V_0 for ckt shown if (i) Vr = 0V (ii) Vr = 0.7v where Vr is cutin voltage of diode. **10**



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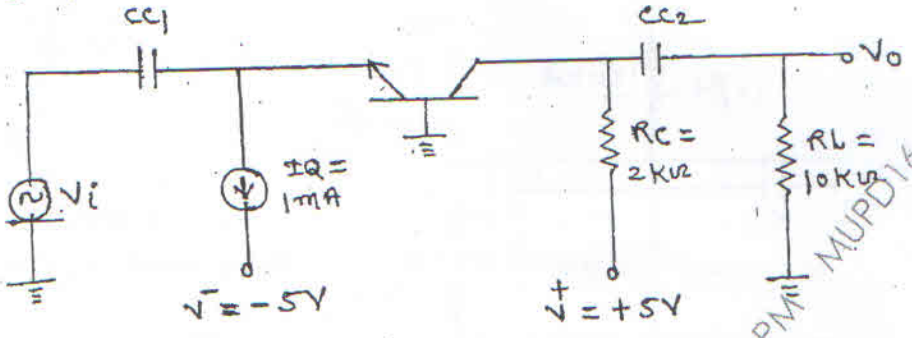
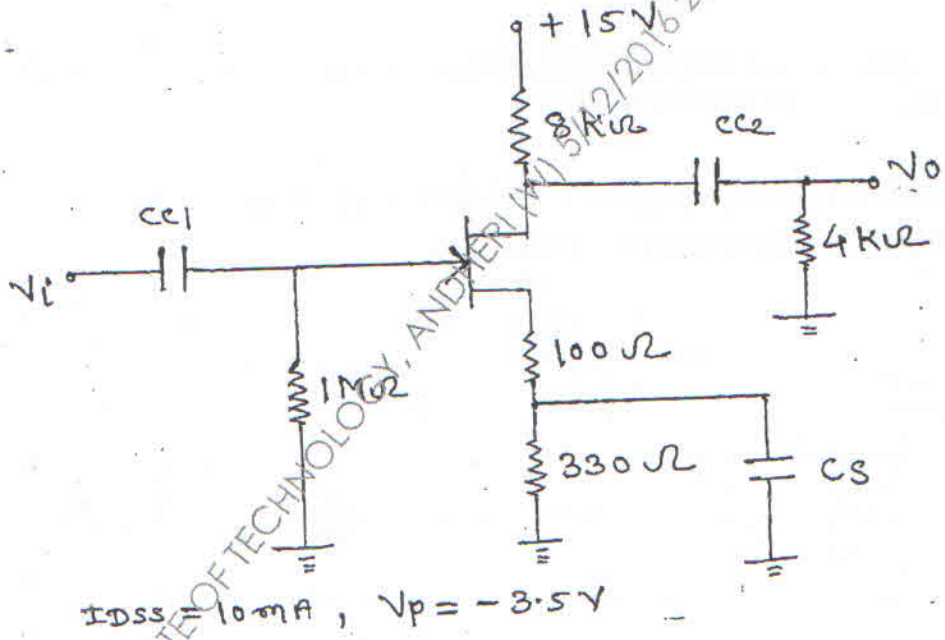
(b) For the common base circuit shown, the transistor has parameters $\beta = 120$ and $V_A = \infty$ 10

(i) Determine the quiescent V_{CEQ}

(ii) Determine the small signal voltage gain and output resistance.



5. (a) For the Amplifier shown determine (i) Q point (ii) Av, Zi, Zo 10



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Sem-III EXTC
A.E-I

(b) Derive expressions for voltage gain, input resistance and output resistance for source follower circuit using n-channel MOSFET. **10**

6. Write short notes on **any Four** :- **20**
   (i) Construction and operation of varactor diode
   (ii) MOS capacitor
   (iii) Transistor as a switch
   (iv) Crystal oscillator
   (v) Hybrid-π model of BJT
