

Q.P. Code : 5079

(3 Hours)

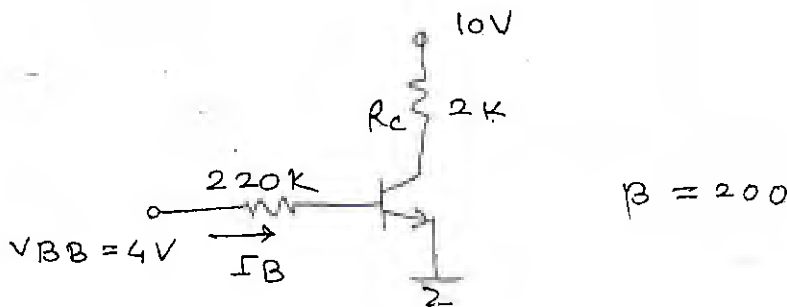
[Total Marks : 80

- N.B. : (1) Question No. 1 is compulsory.
(2) Attempt any **three** questions out of the remaining **five** questions.
(3) Assume suitable data wherever required

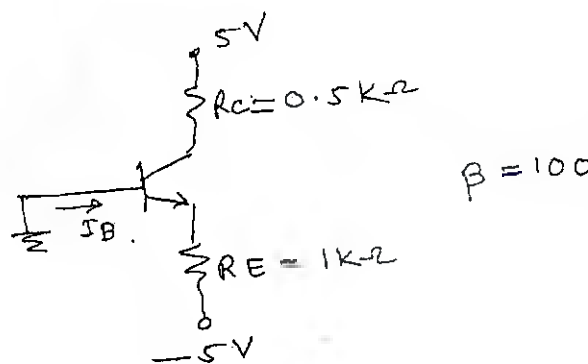
1. Attempt any four.

20

- Draw Input and Output characteristics of BJT in common emitter configuration.
- Draw small signal hybrid π equivalent circuit for npn transistor.
- Explain effect of temperature on JFET and derive equation for zero current drift.
- Calculate I_B , I_C & V_{CE} for common emitter circuit.



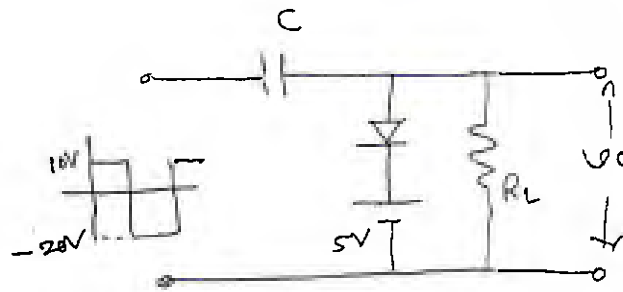
- Find I_B , I_C & V_{CE} for following circuit.



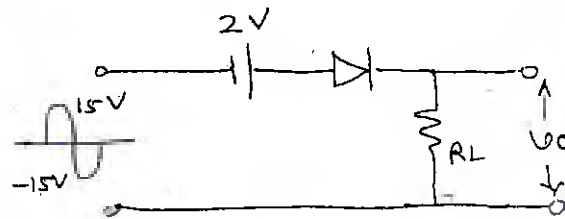
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2. (a) Draw output waveform for clamper and clipper circuits. 10

(i)

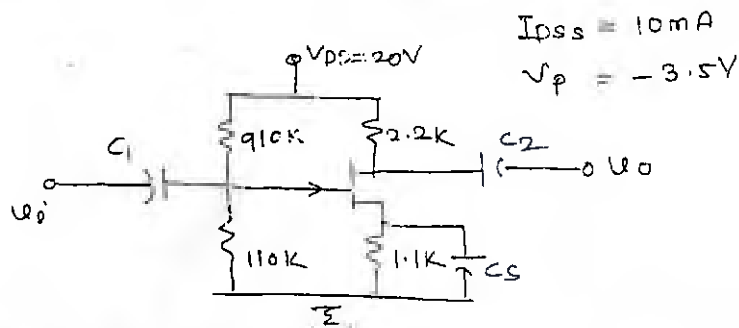


(ii)

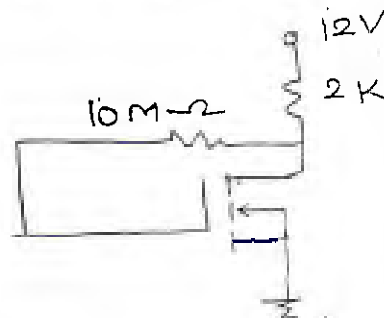


(b) Explain construction & characteristics of n channel Enhancement MOSFET. 10
Draw transfer characteristics & drain characteristics.

3. (a) For JFET amplifier shown below, Calculate A_v , Z_i , Z_o 10

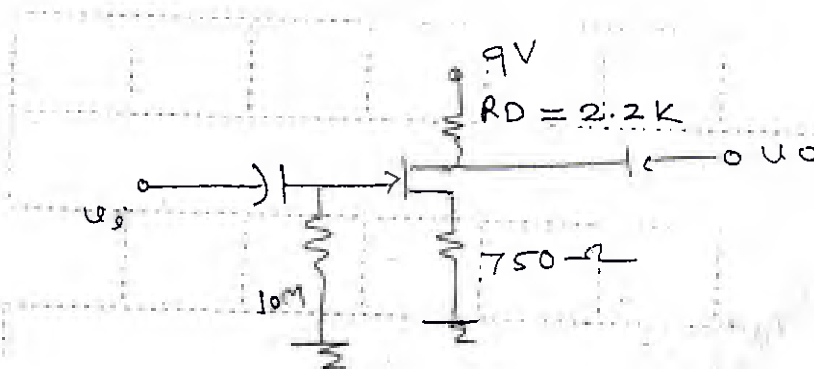


(b) For the circuit shown below, calculate I_{DQ} & V_{DSQ} . It is given that $I_{D(ON)} = 6\text{ mA}$, $V_{GS(ON)} = 8\text{ V}$, $V_{th} = 3\text{ V}$ 10



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4. (a) Explain the working of Wein Bridge Oscillator. Derive the expression for frequency of oscillation for sustained oscillations. 10
 (b) Calculate voltage gain of FET amplifier. 10



$Y_{os} = 40 \mu s$
 $I_{DSS} = 8 \text{ mA}$
 $V_{GS \text{ off}} = -4 \text{ V}$

5. (a) Draw & explain energy band diagram of MOS capacitor operating in
 (i) Accumulation
 (ii) Depletion
 (iii) Inversion mode 10
 (b) Draw emitter follower circuit and derive an expression for voltage gain A_v . 10
6. (a) Draw circuit diagram for phase shift oscillator & derive an expression for frequency of oscillation. 10
 (b) Write short notes on any two. 10
 (i) Photodiodes
 (ii) LC oscillators
 (iii) Transistor as a switch
 (iv) Schottky diode.