

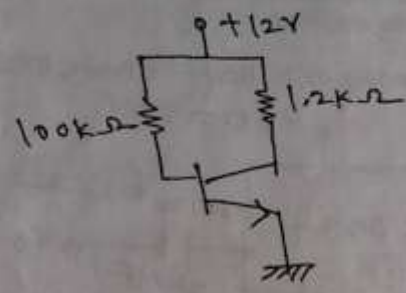
(3 Hours)

[Total Marks 100]

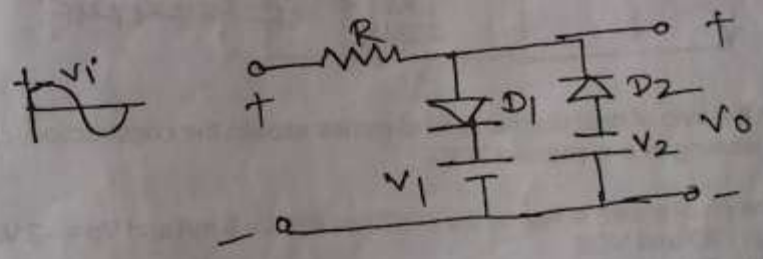
- N.B. (1) Question No.1 is compulsory.
 (2) Attempt any four questions from remaining six questions.
 (3) Assume suitable data wherever necessary.

1. Answer the following :-

- (a) Find the collector current in the circuit shown in figure. The transistor has $B = 100$. Assume $V_{BE}(\text{Active}) = 0.6 \text{ V}$, $V_{BE}(\text{SAT}) = 0.7 \text{ V}$, $V_{CE}(\text{Sat}) = 0.2 \text{ V}$. 5

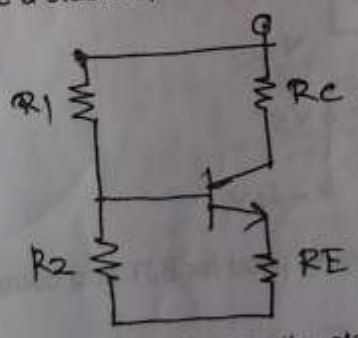


- (b) Write a short note on Clamping Circuit and thier Applications. 5
 (c) Explain with neat waveform working of given clipper circuit shown in figure — 5



- (d) Compare CB, CE, CC configuration of BJT. 5

2. (a) Consider the figure and assume $B = 100$, $V_{CC} = 10 \text{ V}$. Determine the circuit to achieve a stable operating point with $I_C = 500 \mu\text{A}$ and $V_{CE} = 4 \text{ V}$. 10



Assume $S = 10$, $V_E = 1 \text{ V}$.

- (b) Derive the expression for the stability factor "S" for a fixed bias circuit comment on the result. 10

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Con. 5493-SP-7388-09.

3. Design a C. S. amplifier using FET type BFW11 to meet the following specification :—

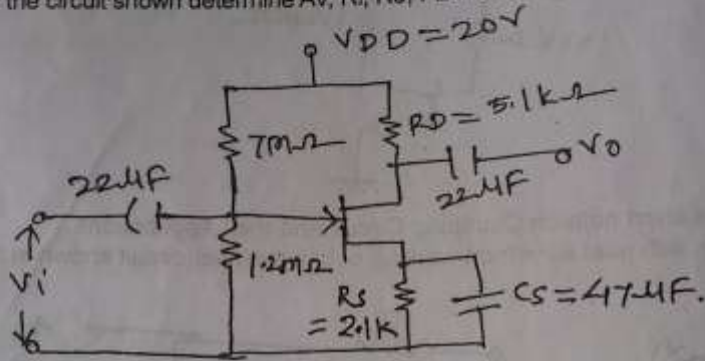
$AV \geq 10, V_o = 3V_{ac}$

R_i better than $1m\Omega$

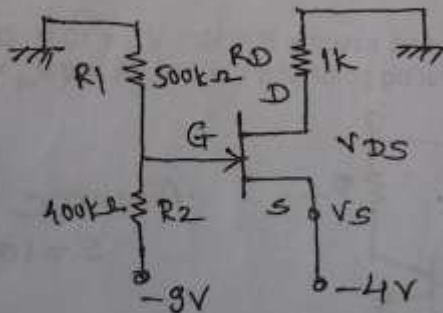
FL better than 25 Hz

Assume the external load connected $R_L = 33 K\Omega$ between the output and ground.
Assume suitable supply potential V_{DD} .

4. (a) For a CE transistor amplifier obtain the values of AV , R_{in} and A_i if the transistor used is BC 147 B with a load resistor $R_C = 2.7 k\Omega$.
(b) Derive relations for input impedance, output impedance, overall voltage gain and current gain of a cascade amplifier.
5. (a) For the circuit shown determine AV , R_i , R_o , FET is having $I_{DSS} = 10 mA$, $V_p = -3.5 V$.



- (b) With the help of neat diagram and sketches explain the construction, characteristics and working of a n-channel JFET.
6. (a) For the circuit shown in figure, the JFET has $I_{DSS} = 9 mA$ and $V_p = -2 V$. Calculate—
(i) I_D and V_{DS}
(ii) The smallest value of R_2 that will keep the device out of cutoff.



- (b) Discuss the various types of biasing techniques used for BJT and compare them.
7. Write short notes on any three of the following :—
(a) Constant Current Source (c) Thermal Runaway in BJT
(b) Cascade Amplifier (d) Bode Plot.