



Reg. No. :

Name :

Third Semester B.Tech. Degree Examination, November 2014
(2013 Scheme)

13.305 : ELECTRONIC CIRCUITS (T)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions. **Each** question carries **2** marks.

1. Explain cross over distortion. How it can be eliminated ?
2. Explain Miller effect.
3. Determine the 3dB frequency of the short circuit current gain of a bipolar transistor.
Given $r_{\pi} = 2.6 \text{ k}\Omega$, $C_{\pi} = 2\text{pF}$ and $C_{\mu} = 0.1 \text{ pF}$.
4. Compare CS, CG and CD configurations.
5. What is CMRR ?
6. What is the significance of PIV of diode in rectifier design ?
7. Compare class B and AB power amplifiers.
8. List any 4 advantages of negative feedback.
9. Obtain expression for low cut off frequency of a high pass circuit.
10. Draw the circuit of a positive clamper.

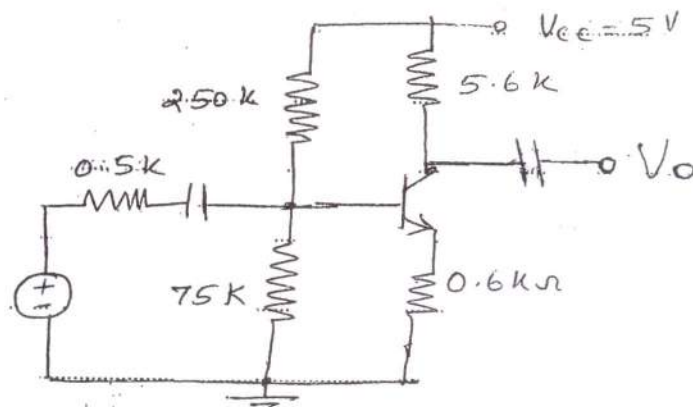
PART – B

Answer **any one** question from **each** Module. **Each** full question carries **20** marks.

Module – I

11. a) Determine the small signal voltage gain A_v of the circuit. Given $\beta = 120$, $V_{BE} = 0.7 \text{ V}$. Determine the input resistance looking in to the base of the transistor.

10

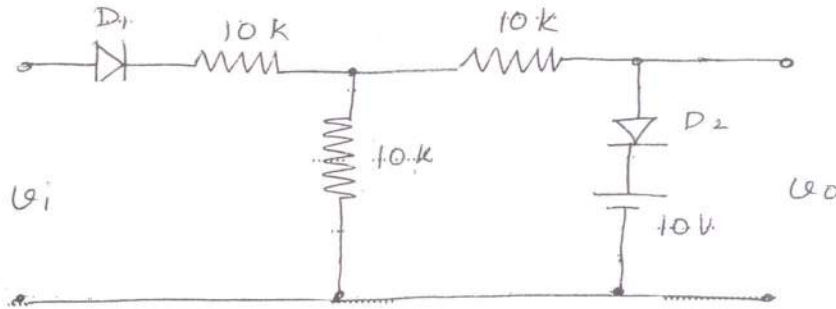


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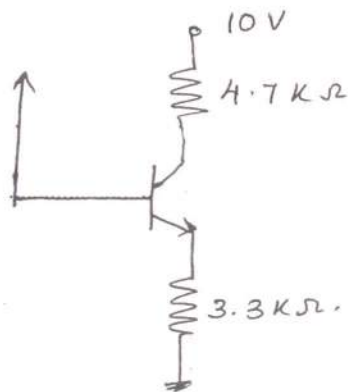
b) Plot the transfer characteristic of the circuit shown. Sketch V_o if $V_i = 40 \sin \omega t$.

10



12. a) Determine voltages at all nodes and currents through all branches.

5



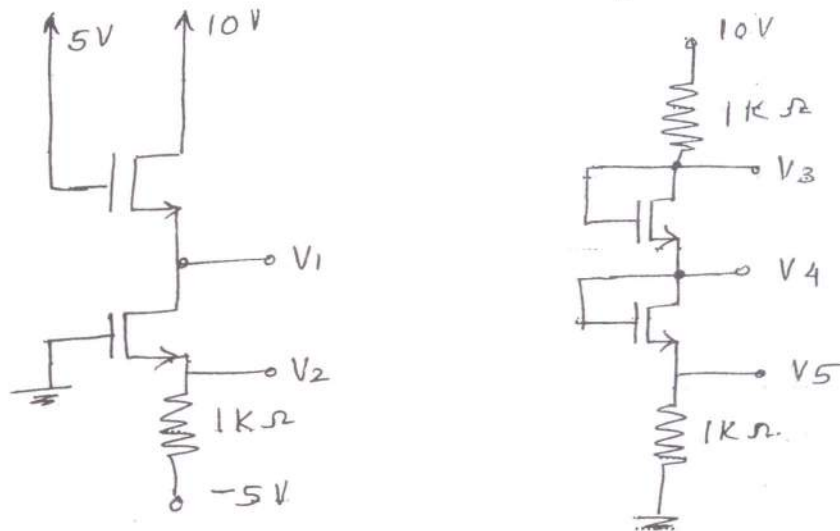
b) Obtain the high frequency equivalent circuit of CE amplifier. Obtain expression for upper cut-off frequency.

15

Module - II

13. a) Find the labeled node voltages $V_t = 1V$, $kn' \frac{W}{L} = 2mA/V^2$.

14

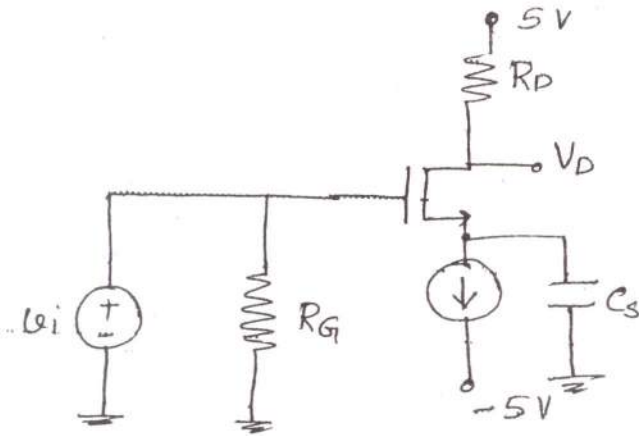


b) Explain how CMRR of a differential pair can be increased.

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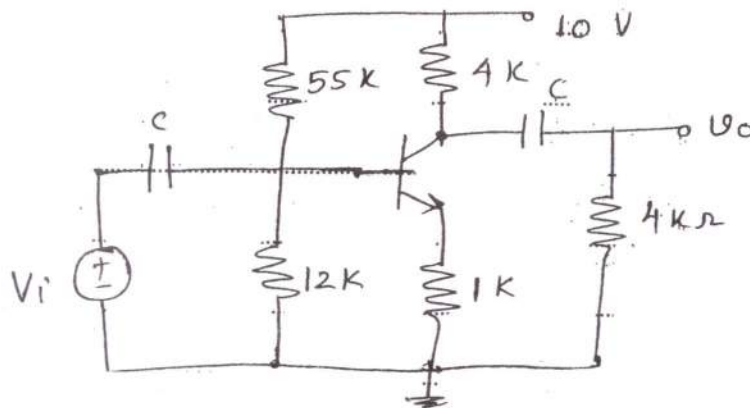


- 14. a) Obtain expression for small signal voltage gain, input impedance and output impedance of a common-Gate amplifier. 10
- b) Design the circuit such that $I_{DQ} = 250 \mu A$, $V_D = 2.5 V$, $V_t = 0.8 V$, $kn' = 80 \mu A / V^2$, $\frac{W}{L} = 3$. 10



Module – III

- 15. a) Obtain expression for frequency of oscillation of Hartley oscillator. 10
- b) Determine the trans conductance transfer function $A_{gf} = \frac{i_o}{V_i}$ of the following circuit. Given $\beta = 100$, $V_{BE} = 0.7$, $V_A = \infty$. 10

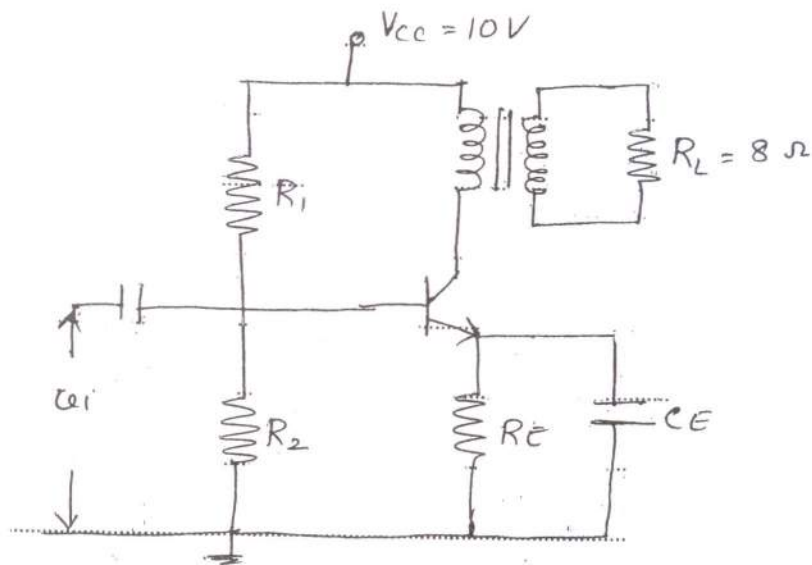


- 16. a) Explain the response of a tuned amplifier. Obtain expression for Q-factor. 10
- b) Explain the working of Wien bridge oscillator. Derive expression for frequency of oscillation. 10



Module – IV

17. a) Explain how Bootstrap circuit produces linear sweep. Obtain expression for sweep time. 10
- b) The load resistance of a full wave rectifier is 500Ω . The transformer rating is 230/30-0-30 V. Diode resistance is 50Ω . Calculate
- 1) the peak average and rms value of current
 - 2) power output
 - 3) efficiency and ripple factor. 10
18. a) For the circuit shown, the base current is 5 mA and the input signal results in a peak base current swing of 4 mA. $\beta = 30$.



Find

- a) a.c. power delivered to the load
 - b) d.c. power drawn by the circuit and
 - c) conversion efficiency. 14
- b) Explain how push pull amplifier reduces nonlinear distortion. 6