



(Pages : 3)

E – 2308

Reg. No. :

Name :

**Third Semester B.Tech. Degree Examination, May 2018
(2013 Scheme)**

13.305 : ELECTRONIC CIRCUITS (T)

Time : 3 Hours

Max. Marks : 100

PART – A

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

1. Design a circuit that integrates input signal of frequency 1kHz.
2. Briefly explain the need for biasing.
3. State Miller's theorem.
4. Explain CMRR.
5. What is voltage gain of Common Source amplifier ? Write an application of CS amplifier.
6. Draw the basic shunt-series feedback topology.
7. Briefly explain, one advantage and one disadvantage of negative feedback.
8. What are the advantages of tuned amplifier ?
9. What is harmonic distortion ?
10. Draw the circuit of bridge rectifier with capacitor filter.

P.T.O.

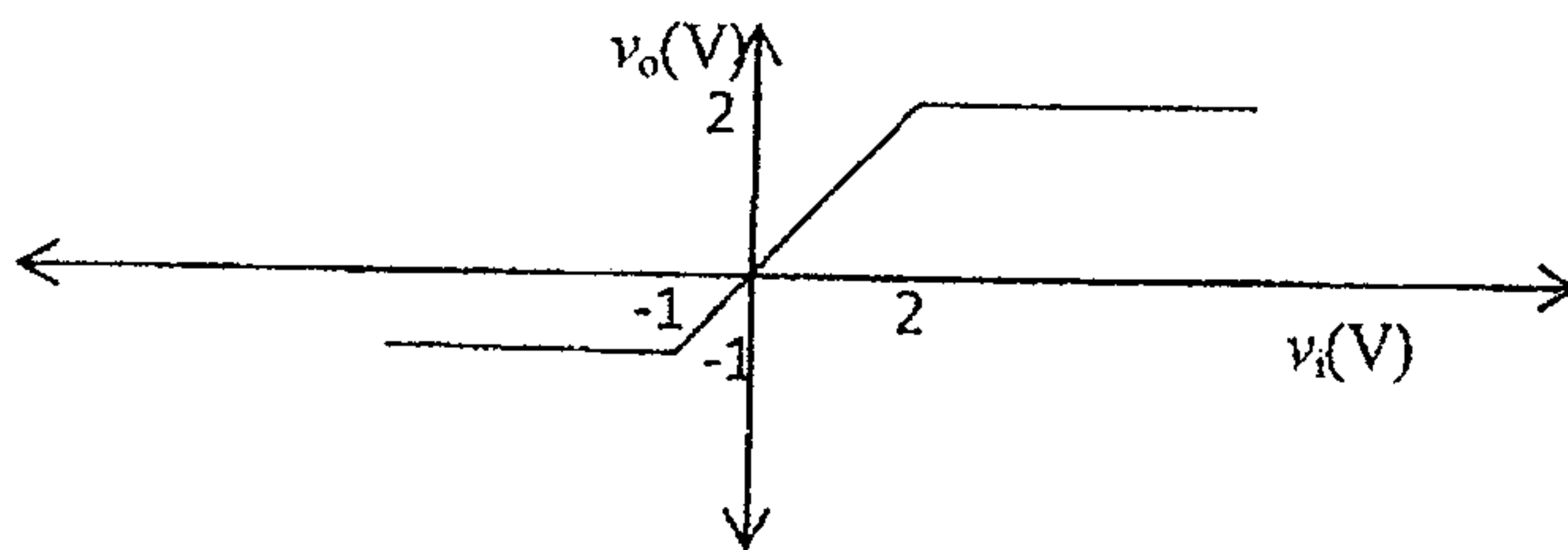


PART – B

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

Module – I

11. a) Design a circuit with the following transfer characteristics. 5



- b) Draw the differentiator circuit. Derive the condition for differentiation. 5
- c) An RC coupled amplifier with $R_1 = 56 \text{ k}\Omega$, $R_2 = 10 \text{ k}\Omega$, $R_C = 2.2 \text{ k}\Omega$, $R_E = 470 \Omega$, $R_L = 1 \text{ k}\Omega$, $C_{C1} = C_{C2} = C_E = 10 \mu\text{F}$ and $V_{CC} = 12\text{V}$. Find Q-point, voltage gain and input resistance. 10

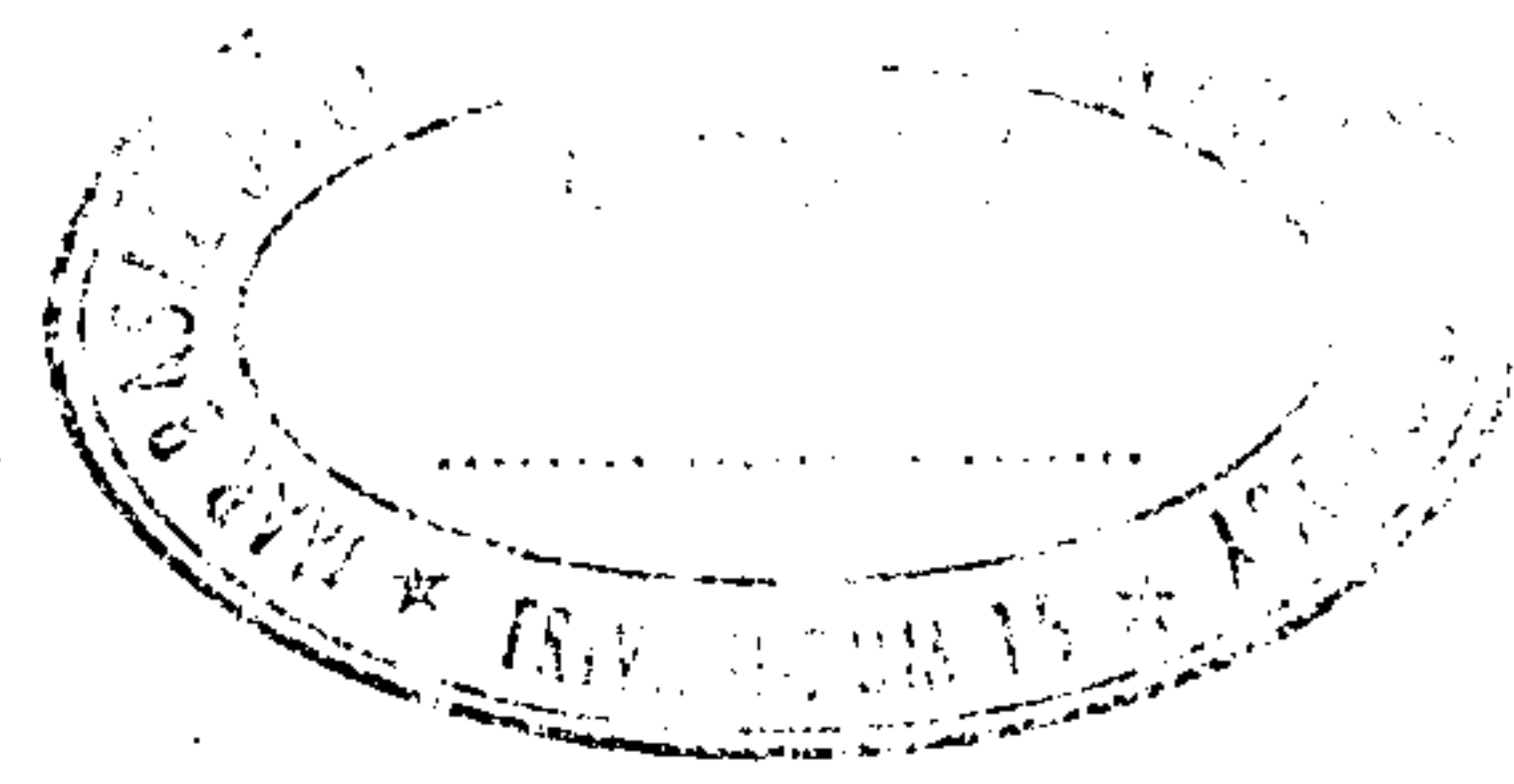
OR

12. a) Draw the voltage divider biasing circuit and explain its working. 5
- b) Draw a CB amplifier circuit and its hybrid- π equivalent. Derive the expressions for voltage gain and input resistance. 10
- c) Explain the reasons for reduction in gain of an RC coupled amplifier for very low and very high frequencies. 5

Module – II

13. a) Draw the constant current source circuit using MOSFET and explain its working. 10
- b) Draw the small signal equivalent circuit of CS amplifier and derive the expressions for voltage gain, input and output resistances. 10

OR



14. a) A CS amplifier without by-pass capacitor has $V_{GS}(Q) = 2V$, $V_{DD} = 5V$, $V_t = 1V$, $R_D = 1k\Omega$, $R_S = 1k\Omega$, $k_n = 0.5 \text{ mA/V}^2$ and $R_L = 2.2k\Omega$. Find Q point, voltage gain and output resistance. 10
- b) Draw the circuit of a MOS differential amplifier and derive the expressions for differential gain. 10

Module – III

15. a) Draw the ideal structure of a series-series feedback amplifier and derive the expressions for voltage gain, input and output resistances. 14
- b) Explain synchronous tuning and staggered tuning. 6

OR

16. a) Draw a circuit in which series-shunt feedback is used. Draw the small signal equivalent circuit and derive the expression for output resistance. 10
- b) Draw the circuit of RC phase shift oscillator and derive the expression for frequency of oscillation. 10

Module – IV

17. a) Draw the bootstrap sweep circuit and explain its working. 10
- b) Draw the circuit of a class B power amplifier. Explain its working and derive the expression for efficiency. 10

OR

18. a) Draw the circuit of a class AB power amplifier and explain its working. Also explain how it removes cross-over distortion. 10
- b) Draw the circuit of series voltage regulator with short circuit protection and explain its working. 10
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