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Reg. No. : .....

Name : .....

Fourth Semester B.Tech. Degree Examination, July 2015
(2008 Scheme)
08.404 : ELECTRONIC CIRCUITS – II (T)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions. **Each** questions carries **4** marks.

1. Explain the linear region of operation of BJT differential amplifier using the normalized DC transfer characteristics.
2. Define difference mode input resistance and common mode input resistance of differential amplifier.
3. What are the advantages of Wilson current mirror circuit ?
4. What is the effect of emitter resistor on the frequency response of differential amplifier ?
5. Define the terms gain sensitivity and bandwidth extension in feedback amplifier.
6. What are the four general types of feedback amplifier topologies and what are the advantages and disadvantages of each topology ?
7. What is the effect of negative feedback on gain and bandwidth of an amplifier ? Explain.
8. Define and explain the Barkhausen criterion of oscillation.
9. Define the terms Delay time, Rise time, Storage time and Fall time of transistor as switch.
10. What is the basic principle of sweep circuits ?

P.T.O.

PART – B

Answer **any two** questions from **each** Module. **Each** question carries **10** marks.

Module – I

11. Derive the expression for differential mode gain common mode gain and CMRR from the small-signal equivalent circuit of bipolar differential amplifier. (dual-input unbalanced output)

12. a) Explain working principle of a MOSFET differential amplifier with active load and biased with current mirror using the circuit diagram.
    b) Derive the expression for differential mode gain from the small-signal equivalent circuit of the MOSFET differential amplifier with active load.

13. a) Differentiate between synchronous and stagger tuned amplifier.
    b) Design a tuned amplifier with centre frequency 255 KHz and Q = 20.

Module – II

14. a) Give the topology of an series-shunt feedback amplifier and derive the expression for closed loop voltage gain.
    b) Consider a series-shunt feedback amplifier in which open loop gain $A_v = 10^5$ and closed loop gain $A_{vf} = 50$. Assume the input resistance and output resistance of the basic amplifier are $R_i = 10\ K\Omega$ and $R_o = 20\ K\Omega$ respectively. Determine the input resistance with feedback of the series input connection and output resistance with feedback of the shunt output connection for an ideal voltage amplifier.

15. Draw the circuit of transconductance amplifier using BJT. From its small signal equivalent circuit derive the expression for the transconductance transfer function.

16. a) Explain the principle of operation of BJT cascode amplifier configuration with circuit diagram.
    b) Derive the expression for voltage gain of the BJT cascode amplifier from the small signal equivalent circuit.

Module – III

17. a) Distinguish between RC oscillators and LC oscillators.
    b) Explain the principle of operation of Hartley oscillator.

18. a) What is the application of UJT oscillator ?
    b) Design a monostable multivibrator with quasistable period of 1 msec.

19. a) Explain the working principle of Schmitt trigger circuit using BJT.
    b) Design a Schmitt trigger circuit for UTP = 6V and LTP = 2V.
