SE/Sem-III CBSGS / EE / EDC

12/5/16

**QP Code : 30548**

[3 hrs] **Total Marks: 80**

**Instructions:**

1. **Question No: 1 is compulsory.**
2. **Answer any three from the remaining five questions.**
3. **Answers to questions should be grouped and written together.**

(5 x 4)

1
- a) Draw the block diagram of a DC power supply system and explain the terms a) rectification efficiency b) ripple factor c) PIV.
- b) State the advantages of negative feedback.
- c) Compare RC and LC oscillators.
- d) Explain with V-I characteristics the working principle of a Schottkey diode.

2
- a) Explain the Barkhausen Criteria of Oscillations. (08)
- b) Draw the hybrid equivalent model of voltage divider bias CE amplifier with $R_E$ bypassed and derive the expression for voltage gain and input impedance. (12)

3
- a) Draw the small signal equivalent circuit of an n-channel JFET amplifier with $R_s$ bypassed and un bypassed and derive the expression of voltage gain in each case. (10)
- b) Find the voltage gain of a two stage cascaded JFET amplifier with the following parameters. (10)
  $V_{DD} = 20V$, $R_{G1} = R_{G2} = 3.3M\Omega$, $R_{D1} = R_{D2} = 2.4K\Omega$, $R_{S1} = R_{S2} = 680\Omega$, $I_{DSS} = 10mA$, $V_P = -4V$.

4
- a) Explain the different thermal compensation techniques in BJT amplifiers (08)
- b) State and draw each topology of negative feedback and explain the effect on i/p impedance, o/p impedance and voltage gain for Current Series Negative Feedback. (12)

5
- a) Draw the circuit diagram of dual input balanced output (DIBO) differential amplifier and derive the relevant AC parameters. (10)
- b) Derive the equation for frequency of oscillation of RC phase shift oscillator using JJET as basic amplifier. Derive the condition of oscillation. (10)

6
- a) Draw neat diagram of UJT relaxation oscillator. Explain its operation. Derive the expression for frequency of output signal. Draw various waveforms. (10)
- b) What is Darlington configuration? Derive the expression of voltage gain of Darlington pair emitter follower. (10)