Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 21356

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2013.

Fourth Semester

Electronics and Communication Engineering

EC 2251/EC 41/10144 EC 402/080290019 — ELECTRONIC CIRCUITS — II

(Regulation 2008/2010)

(Common to PTEC 2251 Electronic Circuits — II for B.E. (Part-Time) Third Semester ECE — Regulation 2009)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — ($10 \times 2 = 20$ marks)

1. Calculate the closed loop gain of a negative feedback amplifier if its open loop gain is 100,000 and feedback factor is 0.01.

2. What is the effect on input and output impedance of an amplifier if it employs voltage series negative feedback?

3. Draw the feedback circuit of a Colpitt;s oscillator. Obtain the value of the equivalent series capacitance required if it uses a L of 100mH and is to oscillate at 40KHz.

4. What is the necessary condition for a Wien bridge oscillator circuit to have sustained oscillations?

5. What is the need for neutralization circuits?

6. Mention two important features of stagger tunned amplifier.

7. A RC low pass circuit has R = 1.5 Kohms and C = 0.2 micro farad. What is the rise time of the output when excited by a step input.

8. What is a regenerative comparator? Give an example circuit.

9. Define slope error and displacement error.

10. Mention two applications of blocking oscillators.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Describe the effect of negative feedback on the bandwidth and harmonic distortion of a amplifier. (10)

(ii) A negative feedback amplifier has an open loop gain of 60,000 and a closed loop gain of 300. If the open loop upper cut off frequency is 15KHz, estimate the closed loop upper cut off frequency. Also, calculate the total harmonic distortion with feedback if there is 10% harmonic distortion without feedback. (6)

Or

(b) Sketch the circuit of a single stage CE amplifier that uses emitter current feedback. Analyse the circuit and derive the equations for gain, input and output impedance with feedback. (16)

12. (a) Draw the circuit diagram and explain the operation of a RC phase shift oscillator. Describe the phase shift network and amplifier gain requirements. Derive the expression for frequency of operation of the circuit. (16)

Or

(b) (i) What is the principle of oscillation of crystals? Sketch the equivalent circuit and impendance-frequency graph of crystals and obtain its series and parallel resonant frequency. (8)

(ii) Explain how crystals are employed in oscillators for stabilization. (8)

13. (a) Explain the functioning of a capacitor coupled single tuned amplifier. With the high frequency transistor model, carry out an analysis and obtain the gain and bandwidth of the amplifier. Plot its frequency response. (16)

Or

(b) What are synchronous tuned amplifiers. Draw the circuit of a two stage capacitor coupled single tuned amplifier and explain with equations the effect of cascading on the gain and bandwith. (16)

14. (a) (i) With a circuit diagram and waveforms, explain the working of a positive clamping circuit. (6)

(ii) Draw a circuit to perform the following:

1. To transmit that part of a sine wave that lies between –3V and +6V.
2. To clip the input sine wave below –4V. (10)

Or

(b) (i) A rectangular pulse of voltage is applied to the base of a transistor driving it from cut off to saturation. Explain the various times involved in the switching process. (8)

(ii) With the help of a circuit diagram and waveforms, explain the operation of a collector coupled astable multivibrator. (8)

15. (a) Draw the circuit diagram and describe the working of a transistor monostable blocking oscillator with base timing. Derive the expression for the pulse width. (16)

Or

(b) (i) With neat circuit diagram and waveforms, explain the operation of a UJT relaxation oscillator. Derive the expressions for the sweep time and frequency of oscillation of the circuit. (8)

(ii) Explain the operation of a simple current time base generator circuit. (8)

———————