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

Question Paper Code : 30941

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2019.

Fourth Semester

Electronics and Communication Engineering

EC 2251 – ELECTRONIC CIRCUITS – II

(Regulation 2008)

(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 × 2 = 20 marks)

1. Mention the three networks that are connected around the basic amplifier to implement feedback concept.

2. State the effect on output resistance and on input resistance of amplifier when current shunt feedback is employed.

3. Draw the equivalent circuit of crystal oscillator.

4. Why is LC oscillator preferred over RC oscillator at radio frequencies?

5. Draw the electrical equivalent circuit of crystal.

6. What are tuned amplifiers? What are the various types of tuned amplifiers?

7. State the application of clipper and clamper circuits.

8. Why is monostable multivibrator also called as delay circuit?

9. Define slope error and displacement error.

10. Mention two applications of blocking oscillators.

PART B — (5 × 16 = 80 marks)

11. (a) With a neat diagram, derive the expression of R_{if}, R_{of}, A_v and A_{vf} for the following. (8 + 8)

(i) Voltage series feedback amplifier

(ii) Current shunt feedback amplifier.

Or

(b) (i) Discuss Nyquist criterion for stability of feedback amplifiers, with the help of Nyquist plot and bode plot. (8)

(ii) An amplifier has a voltage gain of 4000. Its input impedance is 2 K and output impedance is 60 K. Calculate the voltage gain, input and output impedance of the circuit is 5% of the feedback is fed in the form of series negative voltage feedback. (8)

12. (a) (i) Draw the circuit of Wein bridge oscillator using BJT. Show that the gain of the amplifier must be atleast three for the oscillation to occur. (10)

(ii) In a certain oscillator circuit, the gain of the amplifier is $\frac{-16\times10^6}{j\omega}$ and the feedback factor of the feedback network is $\frac{10^8}{\left[2\times10^8+j\omega\right]^2}$. Verify the Barkhausen criterion for the sustained oscillations. Also find the frequency at which the circuit will oscillate. (6)

Or

(b) (i) Explain the working of a Colpitts oscillator with a neat circuit diagram and derive the frequency of oscillation. (8)

(ii) In a Colpitt's oscillator, the value of the inductor and capacitors in the tank circuit are L = 40 mH, C_1 = 100 pF and C_2 = 500 pF. (8)

(1) Find the frequency of oscillation.

(2) If the output voltage is 10 V. find the feedback voltage at the input side of the amplifier.

13. (a) With a circuit diagram, explain the performance of single tuned inductively coupled amplifier.

Or

(b) (i) Brief about high frequency limitations of amplifiers. (6)

(ii) Explain the Hazeltine method of neutralization. (10)

14. (a) (i) Describe the working of a Schmitt trigger circuit with the help of necessary Sketches. (10)

(ii) A square wave whose peak – peak amplitude is 4V extends ±2V w.r.t ground. The duration of the positive section is 0.1 secs and negative section is 0.3 secs. The circuit time constant is 0.3 secs. If this wave form is impressed upon.

(1) RC integrating circuit

(2) RC differentiating circuit.

Find their steady state max and min values of the output wave form and draw the output wave form for both the case. (6)

Or

(b) (i) Sketch the response of RC high pass filter for the following inputs and explain (1) Ramp (2) Pulse. (8)

(ii) Explain the switching characteristics of transistor with a neat sketch. (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)