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**Question Paper Code : 51447**

## B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

**Fourth Semester**

**Electronics and Communication Engineering**

**EC 2251/EC 41/10144 EC 402/080290019 – ELECTRONIC CIRCUITS – II**

**(Regulations 2008/2010)**

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

**Time : Three Hours** **Maximum : 100 Marks**

**Answer ALL questions.**

**PART – A (10 × 2 = 20 Marks)**

1. Why gain bandwidth product remains constant with the introduction of negative feedback ?
2. A voltage series feedback amplifier has a voltage gain with feedback as 83.33 and feedback ratio as 0.01. Calculate the voltage gain of amplifier with feedback.
3. What is the major disadvantage of a Twin-T oscillator ?
4. In a Hartley oscillator, if $L_1 = 0.2$ mH, $L_2 = 0.3$ mH and C = 0.003 μF. Calculate the frequency of its oscillations.
5. What is unloaded Q ?
6. What are the different coil losses ?
7. Why is neutralization required in tuned amplifiers ?
8. Define the threshold points in a Schmitt trigger 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 $\frac{-16 \times 10^6}{j\omega}$ and the feedback factor of the feedback network is $\frac{10^8}{[2 \times 10^8 + j\omega]^2}$. 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.

(3) Find the minimum gain, if the frequency is changed by charging 'L' alone.

(4) Find the value of $C_1$ for a gain of 10 if $C_2$ is kept constant as 500 pF. Also find the resulting new frequency.

13. (a) (i) Draw the circuit diagram of a single tuned amplifier and explain the circuit operation. Also derive the expression for its frequency of oscillation. **(10)**

(ii) Discuss the effect of cascading tuned amplifiers. **(6)**

**OR**

(b) (i) Explain the working of stagger tuned amplifiers with appropriate derivations. **(10)**

(ii) Explain the instability of tuned amplifiers and explain any one technique for stabilization. **(6)**

14. (a) With a circuit diagram and waveforms explain the operation of a transistor based bistable multivibrator. **(16)**

**OR**

(b) (i) Discuss on the response of a RC low-pass circuit for (1) square input and (2) ramp input. **(8)**

(ii) Discuss on the effect of RC time constant and condition for the circuit to operate as integrator. **(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 a 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)**

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