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Question Paper Code : 31356

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Fourth Semester

Electronics and Communication Engineering

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

(Regulation 2008/2010)

(Common to PTEC 2251 — Electronic Circuits-II for B.E. (Part-time) Third Semester – Electronics and Communication Engineering – Regulation 2009)

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. List the characteristics of an amplifier which are modified by negative feedback.

2. In a negative feedback amplifier, A = 100, $\beta = 0.04$ and Vs = 50mV , find (a) gain with feedback (b) output voltage (c) feedback factor (d) feedback voltage.

3. Differentiate oscillator and amplifier.

4. State the Barkhausen criterion for sustained oscillation. What will happen to the oscillations if the magnitude of the loop gain is greater than unity?

5. Draw the electrical equivalent circuit of crystal.

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

7. Why is neutralization required in tuned amplifiers?

8. Define the threshold points in a Schmitt trigger circuit.

9. Determine the value of capacitors to be used in an astable multivibrator to provide a train of pulse of $4\mu s$ wide at a repetition rate of 80 kHz if $R_1 = R_2 = 10k\Omega$.

10. List the applications of time base generators.

PART B — (5 × 16 = 80 marks)

11. (a) (i) Draw the block diagram of a voltage series feedback amplifier and derive the equation for input impedance, output impedance and the voltage gain. (10)

(ii) Explain how a negative feedback in an amplifier helps in reduction of distortion and noise. (6)

Or

(b) (i) Draw the typical circuit for current series feedback confirmation and derive the expression for voltage gain, current gain, input impedance and output impedance. (10)

(ii) Discuss the effect of negative feedback on stabilization of gain. (6)

12. (a) (i) Explain the working of Hartley oscillator. Derive the expression for the frequency of oscillation and the condition for oscillation. (10)

(ii) Describe the operation of Twin -T oscillators. (6)

Or

(b) (i) Draw the circuit diagram of RC phase shift oscillator and explain its operation by deriving the expression for frequency of oscillation. (10)

(ii) Discuss about the frequency stability of an oscillator. (6)

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) (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) (i) Explain the operation of astable multi vibrator with neat diagrams. (8)

(ii) With the help of a neat circuit diagram and waveforms, explain the working of transistor current time base generator. (8)

Or

(b) (i) With neat sketches, describe the principle and operation of monostable blocking oscillator with base timing. (8)

(ii) Describe the operation of UJT and its emitter characteristics. (8)