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Question Paper Code : 80442

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2021.

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 — ($10 \times 2 = 20$ marks)

1. Define 'feedback factor' of a feedback amplifier.

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

3. Compare RC phase shift and Wien bridge oscillator.

4. A Hartley oscillator circuit has C = 500pF, L_1 = 20 mH and L_1 = 5 mH. Find the frequency of 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) (i) For a feedback amplifier, derive the expressions for (1) the gain with feedback (2) Lower cut-off frequency and (3) Upper cut-off frequency. (8)

(ii) If an amplifier has a bandwidth of 300 kHz and a voltage gain of 100, what will be the new bandwidth and gain if 10% negative feedback is introduced? What will be the gain-bandwidth product before and after feedback? What should be the amount of feedback if the bandwidth is to be limited to 800 kHz? (8)

Or

(b) (i) What is the effect of a current series negative feedback on input resistance and output resistance of a BJT amplifier? Explain the same, with necessary circuit, equivalent-circuit and equations. (8)

(ii) A current series feedback amplifier is shown in the figure 11 b(ii).

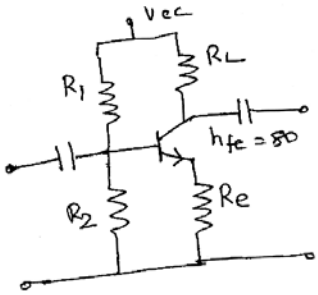

Fig.11 b(ii)

It has the following parameters

$R_1 = 20K\,\Omega, R_2 = 20K\,\Omega, h_{ie} = 2\,K\,\Omega, R_L = 1K\,\Omega, R_e = 100\,\Omega,$

$h_{fe} = 80; h_{re} = 0; h_{oe} = 0.$

Calculate A_v, β, R_{if} and A_{uf}. (8)

12. (a) Explain RC phase shift oscillator with neat diagram. Derive its frequency of oscillation. Give the amplifier gain and feedback network gain for the sustain oscillator operation. (16)

Or

(b) Draw the circuit diagram and explain the working of Hartley oscillator. Also derive the expression for frequency of oscillation and condition for sustained oscillation. (16)

13. (a) With a circuit diagram, explain the performance of single tuned inductively coupled amplifier. (16)

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)

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