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Question Paper Code : 52910

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

Third/Fourth Semester

Electronics and Communication Engineering

EC 6401 — ELECTRONIC CIRCUITS II

(Regulation 2013)

(Also common to: PTEC 6401 — Electronic Circuits II for B.E. (Part-Time) – Third Semester – Electronics and Communication Engineering — (Regulation – 2014))

Time : Three hours Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define feedback factor or feedback ratio.

2. What is Nyquist diagram?

3. Why RC phase shift is needed in a RC phase shift Oscillator?

4. Name any one low frequency and high frequency oscillator.

5. What are the characteristics of an ideal tuned amplifier?

6. What are advantages of double tuned amplifier over single tuned amplifier?

7. Name two methods of triggering for bistable multivibrators.

8. What is meant by Hysteresis voltage in a Schmitt trigger?

9. What is blocking oscillator? Why it is so called?

10. What do you mean by linear time base generator?

PART B — (5 × 13 = 65 marks)

11. (a) (i) The emitter follower circuit in Fig. 1 has $R_s = 600\Omega$, $R_L = 2K\Omega$, hfe = 80 and hie = 5 $K\Omega$. Calculate A_i, R_i, A_v, R_o and R_{of}. (10)

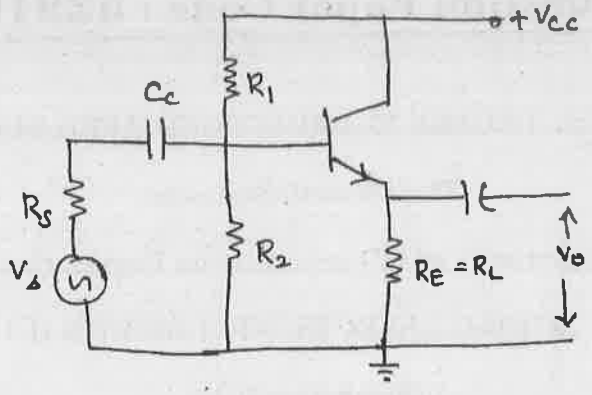

Fig. – 1

(ii) Draw the block diagram of shunt-shunt feedback configuration of an amplifier and comment on its input and output resistance with feedback. (3)

Or

(b) Derive the expression for finding the output resistances of voltage series and current series feedback.

12. (a) With neat circuit diagram, explain Wien bridge oscillator.

Or

(b) (i) Discuss the principle of oscillation in crystals and draw the equivalent circuit, impedance frequency graph of crystals and give expression for its series and parallel frequencies. (10)

(ii) State and explain the factors that contribute to change in change in frequency of oscillations. (3)

13. (a) Discuss the effects of cascading single tuned amplifiers on band width.

Or

(b) (i) Explain Class-C tuned amplifier and derive its efficiency. (10)

(ii) Mention the applications of Class-C tuned amplifier. (3)

14. (a) Design a symmetric collector coupled astable multivibrator to generate a square wave of 10 kHz having peak to peak amplitude of 10 v, where h_{FE} min = 30, $V_{CE(sat)} = 0.2\ v$, and $I_{C(sat)} = 2mA$.

Or

(b) Giving circuit details, explain the operation of a schmitt trigger using transistors. Show how schmitt trigger can be used for wave shaping purpose.

15. (a) With neat circuit diagram explain monostable blocking oscillator with base and emitter timing. Draw necessary waveforms.

Or

(b) Explain how UJT circuit is used for generating sweep output. Also derive the expression for sweep period and frequency.

PART C — (1 × 15 = 15 marks)

16. (a) (i) A voltage series negative feedback amplifier has a voltage gain without feed back A = 500, input resistance $R_i = 3K\Omega$, output resistance $R_o = 20K\Omega$ and feed back ratio $\beta = 0.01$. Calculate the voltage gain A_f, input resistance R_{if} and output resistance R_{of} of the amplifier with feedback. (6)

(ii) For the circuit shown in Fig. 2,

(1) Sketch the output waveform if $V_1 = 6$ v and $V_2 = 8$v.

(2) Sketch the output waveform if $V_1 = V_2 = 10$v

(3) Sketch the output for the input triangular wave of peak value $V_p = 15$v, if $V_1 = 10$v and $V_2 = 5$v. (9)

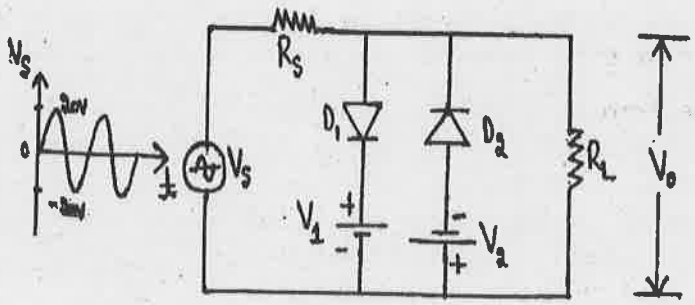

Fig. – 2

Or

(b) (i) A tuned collector oscillator in a radio receiver has a fixed inductance of $60\mu H$ and has to be tunable over the frequency band of 400 to 1200 kHz. Find the range of variable capacitor. (5)

(ii) In a Colpitts oscillator, the values of the inductors and capacitors in the tank circuit are L = 40 mH, C_1 = 100 pF and C_2 = 500 pF.

(1) Find the frequency of oscillations.

(2) If the output voltage is 10 V, find the feedback voltage.

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

(4) Find the value of C_1 for a gain of 10.

(5) Also, find the new frequency. (10)

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