PART – C (1×15=15 Marks)

16. a) i) Draw a single stage current series feedback amplifier and draw the basic amplifier without feedback and its equivalent circuit. Also derive for voltage gain without feedback. (9)

ii) A tank circuit having a 5 mH coil with resistance 22 Ω and C = 1nF is connected as load to a single tuned amplifier with R_0 = 10 K. Calculate loaded and unloaded quality factor. (6)

(OR)

b) i) Draw a two stage voltage series feedback amplifier and its basic amplifier. Derive for A_v and A_{vf} with equivalent circuit. (9)

ii) Design and draw the astable multivibrator circuit using BJT to generate a pulse waveform 0 – 10 V at 5 KHz with 50% duty cycle. (6)

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

Question Paper Code : 50437

B.E./B.Tech./B.Arch. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2017
Fourth Semester
Electronics and Communication Engineering
EC6401 : ELECTRONIC CIRCUITS – II
(Regulations 2013)

Time : Three Hours Maximum : 100 Marks

Answer ALL questions

PART – A (10×2=20 Marks)

1. The voltage gain without negative feedback is 40 dB. What is the new voltage gain if 3% negative feedback is introduced ?
2. A multipole amplifier having a first pole at 1 MHz and an open-loop gain of 100 dB is to be compensated for closed-loop gains as low as 20 dB by an introduction of a non-dominant pole. At what frequency must the pole be placed ?
3. Give any two examples for high frequency and low frequency oscillators.
4. State Barkhausen criterion.
5. What is the use of transformer in tuned amplifier circuit ?
6. Determine the bandwidth of two stage synchronous tuned amplifier. Assume the bandwidth of individual stage is 200 kHz.
7. What is the role of commutation capacitor in Bistable multivibrator circuit ?
8. Differentiate between clipper and clamper circuit.
9. Design a second order HPF with identical RC section. Assume the gain is 3, f = 35 KHz, C = 0.01 microfarad.
10. Differentiate between monostable and astable multivibrators.

PART – B (5×13=65 Marks)

11. a) Identify the nature of feedback in Figure 1. Let R_{C1} = 3 KΩ, R_{C2} = 500Ω, R_E = 50Ω, $R_S = R_F$ = 1.2 KΩ, h_{fe} = 50, h_{ie} = 1.1 KΩ, $h_{re} = h_{oe}$ = 0. Determine the overall voltage gain (A_{vf}) and overall current gain (A_{if}). (13)

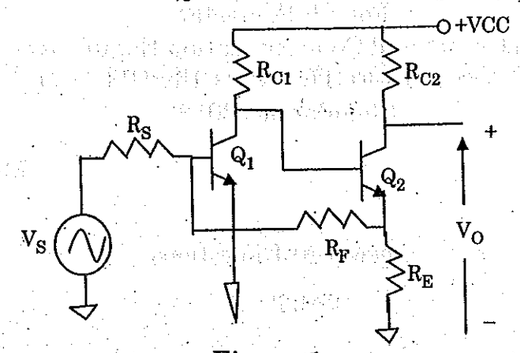

Figure 1

(OR)

b) Consider a three-pole feedback amplifier with a loop gain given by

$$T(f) = \frac{5\times10^5}{\left(1+j\frac{f}{10^6}\right)\left(1+j\frac{f}{10^7}\right)\left(1+j\frac{f}{10^8}\right)}$$

Determine the frequency of the dominant pole of stabilize the feedback system. Assume the phase margin is atleast 45°. (13)

12. a) i) Draw Wein Bridge oscillator using BJT, explain and derive the condition for oscillation. (10)

ii) In Colpitt's oscillator $C_1 = 1\,\mu F$ and $C_2 = 0.2\,\mu F$. If the frequency of oscillation is 10 KHz, find the value of inductor. Also find the required gain for sustained oscillation. (3)

(OR)

b) Draw Hartely oscillator using FET, explain and derive the condition for oscillation. (13)

13. a) Explain single tuned amplifier and derive for gain and resonant frequency. (13)

(OR)

b) i) Explain the stability of tuned amplifiers using Neutralization techniques. (9)

ii) Explain stagger tuned amplifier. (4)

14. a) Consider the collector-coupled monostable multivibrator whose components and supply voltages are indicated in Figure 2(a), calculate the voltage levels (V_{B2}, V_{C2}, V_{C1}, V_{B1}) of the waveforms during (t = 0⁻, 0 and T) period in Figure 2(b). Also find the overshoot voltage, δ. Assume silicon transistor having h_{fe} = 50, V_σ = 0.7 V, V_γ = 0.5 V and input resistance, 200Ω. (13)

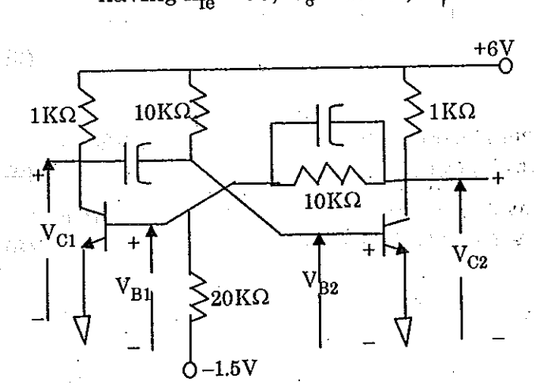

Figure – 2(a)

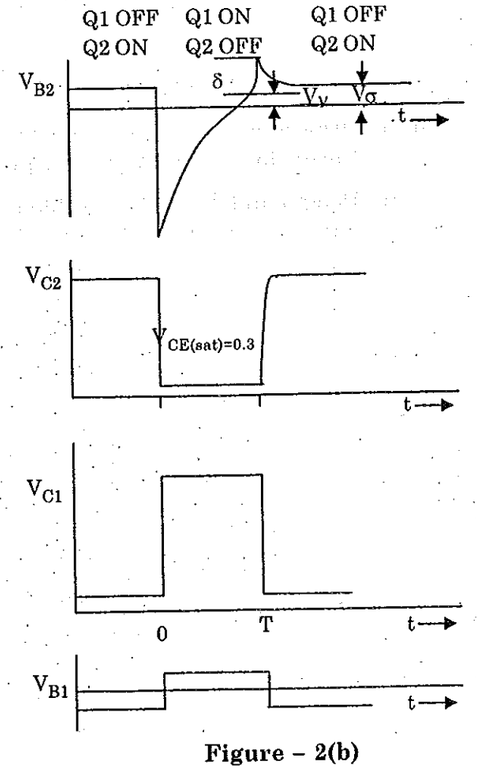

Figure – 2(b)

(OR)

b) Explain the working of Schmitt Trigger with circuit. With the help of neat circuit diagram explain the working principle of emitter coupled astable multivibrator. (13)

15. a) i) Explain the working principle of voltage sweep generator in detail. (7)

ii) Explain the working principle of current time base circuit. (6)

(OR)

b) i) Explain the working principle of UJT Sawtooth generator. (6)

ii) Explain the working principle of free running blocking oscillator. (7)