

Time : 3 Hours]

[Total Marks : 80
 [Min. Passing Marks : 24

Attempt any five questions, selecting one question from each unit.

All questions carry equal marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination.
 (Mentioned in form No. 205)

1. _____ NIL _____

2. _____ NIL _____

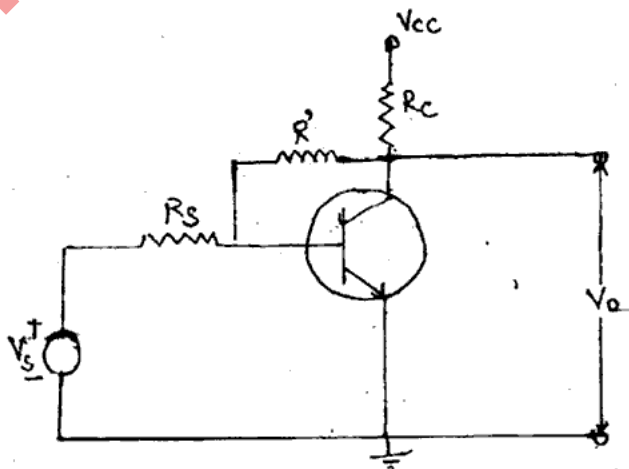
UNIT - I

- 1 (a) What do you mean by feedback in amplifiers? Explain how negative feedback in an amplifier helps in reducing the distortion and noise. 8

- (b) List five characteristics of an amplifier which are modified by negative feedback. Explain them in brief. 8

OR

- 1 (a) Identify the topology in the circuit. Prove that the voltage of the amplifier with feedback is given by $\frac{-R'}{R_S}$.



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- (b) Calculate the bandwidth input impedance and output impedance of a negative feedback amplifier.

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UNIT - II

- 2 (a) Sketch the topology for a generalised resonant circuit oscillator, using impedance Z_1 , Z_2 , Z_3 . At what frequency will the circuit oscillate? Under what conditions does the configuration reduces to Hartley Oscillator?

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- (b) What is Schmitt triggering? Explain the working of a schmitt trigger with the help of a neat circuit diagram and waveform.

8

OR

- 2 (a) Explain the Barkhausen criterion for sustained oscillation. An RC phase shift oscillator is required to oscillate at 1 KHz. JFET used has $g_m = 5 \text{ mA/V}$ and $r_d = 20 \text{ k}\Omega$. If $R = 10 \text{ K}\Omega$. find the value of $r_{\text{tuonline.com}}$

(i) Capacitance in RC network.

(ii) External load resistance R_D .

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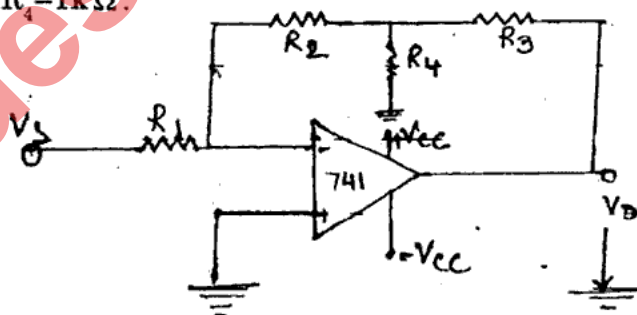
- (b) Normally, crystal controlled oscillator are not available beyond 10 MHz, why?

- (c) Explain the working of BJT bistable multivibrator.

8

UNIT - III

- 3 (a) Find V_O/V_S for the circuit in figure. Use $R_1 = 5 \text{ K}\Omega$, $R_2 = R_3 = 20 \text{ k}\Omega$ and $R_4 = 1 \text{ k}\Omega$.



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- (b) Write short note on :

(i) Logarithmic amplifier using OP-AMP

(ii) Differentiator.

8

OR



- 3 (a) Define following parameters in brief :
 (i) Slew Rate
 (ii) CMRR
 (iii) Input offset voltage
 (iv) PSRR
 (v) Input offset current drift. 8
- (b) Explain the operation of Integrator using OP-AMP and also draw input and output waveform. 8

UNIT - IV

- 4 (a) Explain an monostable multivibrator using IC-555, with functional block diagram of IC. 8
- (b) Connect IC-555 as astable multivibrator with following particulars $R_A = R_B = 7.5 \text{ K}\Omega$, $C = 0.1 \mu\text{F}$, $V_{CC} = 5\text{V}$. find output frequency. 8

OR

- 4 (a) Explain the 555 timer IC ? Explain the operation of monostable multivibrator using IC-555 timer. 8
- (b) What is bleeder resistor ? Explain Bleeder Resistor Regulator with proper diagram. 8

UNIT - V

- 5 (a) In a class - B push - pull amplifier, prove that $P_{C \max} = 4/\alpha^2 P_{\max}$. 16
- (b) What is meant by cross-over distortion in class - B amplifier. Explain how it is overcome in class-AB amplifier operation ?
- (c) Discuss the classification of amplifiers based on function, frequency, conduction angle, type of coupling and load.

OR



- 5 (a) Draw the schematic circuit diagram of series fed class-A amplifier and explain its working.
- (b) A sinusoidal signal $V_s = 1.95 \sin 400t$ is applied to a power amplifier the resulting current is $i_o = 12 \sin 400t + 1.2 \sin 800t + 0.9 \sin 1200t + 0.4 \sin 1600t$. Calculate :
- (i) Total harmonic distortion.
- (ii) The percentage increase in power because of distortion.
- (c) Show the classification of power amplifier using output characteristics load line and operating point.

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