

22346

11819

3 Hours / 70 Marks

Seat No.

--	--	--	--	--	--	--	--

- Instructions* –
- (1) All Questions are *Compulsory*.
 - (2) Answer each next main Question on a new page.
 - (3) Illustrate your answers with neat sketches wherever necessary.
 - (4) Figures to the right indicate full marks.
 - (5) Assume suitable data, if necessary.
 - (6) Use of Non-programmable Electronic Pocket Calculator is permissible.
 - (7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following:

10

- a) State the types of BJT and draw their symbol.
- b) Define amplifier. State the types of coupling in multistage amplifier.
- c) State Barkhausen's criteria for sustained oscillations.
- d) List the types of feedback connections. Identify the feedback connection given in Figure No. 1.

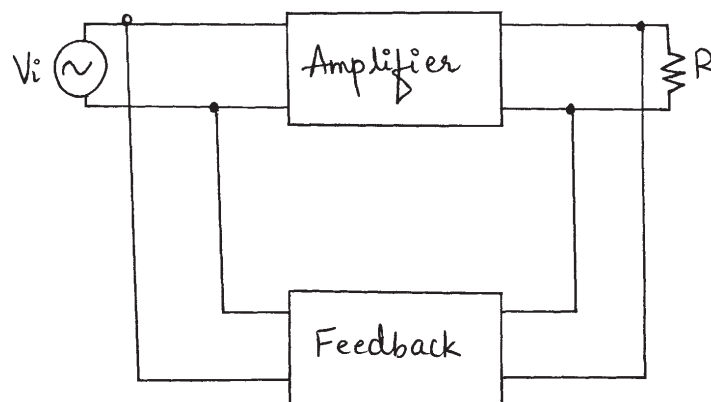


Fig. No. 1

P.T.O.

- e) State the need of wave shaping circuits.
- f) Define the following terms:
 - (i) Load regulation
 - (ii) Line regulation
- g) State the functions of rectifier and filter circuit in regulated power supply.

2. Attempt any THREE of the following: 12

- a) Draw the circuit diagram of transistor in CE configuration and draw input and output characteristics.
- b) Explain the working of n -channel JFET with neat diagram.
- c) Compare class A, class B and class C power amplifiers on the basis of :
 - (i) Conduction angle of collector current
 - (ii) Position of Q - point
 - (iii) Distortion in output voltage
 - (iv) Efficiency
- d) Define the following parameters of JFET
 - (i) DC drain resistance (r_d)
 - (ii) Amplification factor (μ)
 - (iii) Trans conductance (g_m)State the relation between μ , r_d and g_m .

3. Attempt any THREE of the following: 12

- a) Explain the operation of transistor as a switch with neat diagram.
- b) Describe the self biased method for FET with neat diagram.
- c) Draw and explain UJT relaxation oscillator with circuit diagram.
- d) The negative half cycles are to be clipped from the given input signal. ($V_i = 10 \sin \omega t$). Name and draw the circuit with input - output waveforms.

- 4. Attempt any THREE of the following:** **12**
- a) Define α and β of transistor and derive the relation between α and β .
 - b) Find the values of V_{DS} and V_{GS} for given values of $I_D = 5 \text{ mA}$, $V_{DD} = 10\text{V}$, $R_D = 1\text{k}\Omega$ and $R_s = 500 \Omega$.
 - c) Draw the circuit diagram of class B push pull amplifier and describe its working.
 - d) Explain what is cross - over distortion. How it is overcome, show with circuit diagram?
 - e) Design regulated dual power supply for $\pm 5\text{V}$ using regulator IC's.
- 5. Attempt any TWO of the following:** **12**
- a) Explain thermal runaway in transistor. How can it be avoided? List any two methods of biasing of transistor.
 - b) Draw circuit diagram and explain the operation of transformer coupled class A power amplifier. State its advantages.
 - c) Draw circuit diagram of RC differentiator for a sinusoidal input. Derive the expression for output voltage. In case, if same circuit is connected to a square wave input, draw the output waveform.
- 6. Attempt any TWO of the following:** **12**
- a) A phase shift oscillator has $R = 220 \text{ k}\Omega$ and $C = 500 \text{ pF}$. Calculate the frequency of sine wave generated by the oscillator. State the applications of RC oscillators.
 - b) A dc level of $+2\text{V}$ is to be added to the given input signal ($V_i = 10 \sin \omega t$). Explain the working principle of this application with circuit diagram and input - output waveforms.
 - c) Draw the circuit diagram of DC regulated dual power supply for $+ 12\text{V}$ using IC's 78XX and 79XX. State the necessity of regulated power supply.
-