22346

Instructions – (1) All Questions are *Compulsory.*

(2) Illustrate your answers with neat sketches wherever necessary.

(3) Figures to the right indicate full marks.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. **Attempt any <u>FIVE</u> of the following:** **10**

a) Draw symbol of :-

(i) NPN transistor

(ii) PNP transistor

b) List various transistor biasing methods.

c) Draw symbol of :-

(i) FET-P channel

(ii) EMOSFET-N channel.

d) Define collector efficiency of power amplifier.

e) State Barkhausen criteria for sustained oscillation.

f) Compare linear and Non-linear wave shaping circuits. (Any two points.)

g) Draw circuit of zener diode as voltage regulator.

Marks

2. **Attempt any <u>THREE</u> of the following:** **12**

a) Define α, β and γ with respect to transistor configuration. State relation between α and β.

b) Draw circuit diagram of FET biasing.

   (i) Self-bias method

   (ii) Voltage divider bias.

c) Describe FET as an amplifier with circuit diagram.

d) Describe UJT as relaxation oscillator with neat circuit diagram.

3. **Attempt any <u>THREE</u> of the following:** **12**

a) Draw the circuit diagram of two stages R-C coupled amplifier and describe it's working.

b) Draw construction and describe working of N-channel JFET with neat sketch.

c) Describe the working of transistorized crystal oscillator with the help of circuit diagram.

d) Describe the working of transistor as a switch and give the application of it.

4. **Attempt any <u>THREE</u> of the following** **12**

a) Draw the block diagram of DC regulated power supply and describe the working of each block.

b) Compare power amplifiers- class A, class B class AB and class C on the basis of:

   (i) Angle of conduction.

   (ii) Position of Q point.

   (iii) Efficiency.

   (iv) Distortion in output voltage.

Marks

c) Define the terms with respect of JFET.

    (i)   Pinch – off voltage

    (ii) Dc drain resistance.

    (iii) Transconductance

    (iv) Amplification factor.

d) Compare CB, CE, CC on the basis of following points:-

    (i)   Input resistance

    (ii) Output resistance

    (iii) Current gain

    (iv) Voltage gain.

5.   **Attempt any <u>TWO</u> of the following**   **12**

a) In common emitter configuration if $\beta=150$ leakage current $I_{CEO} = 100\mu A$ and base current is 0.5mA determine I_C and I_E. Draw CE configuration circuit diagram.

b) List four applications of wave shaping circuits. Describe the working of RC integrator with neat waveforms.

c) Build the circuit diagram to get $+10\,V_{dc}$ and $-10V_{dc}$ using IC 7810 and IC 7910 along with rectifier. Calculate load regulation if regulator produces 10.2 V and 10 V output at no-load and full-load conditions respectively.

Marks

6. **Attempt any TWO of the following:** **12**

a) Single stage class B amplifier is operating with 1KΩ load. A dc meter in the collector reads 10mA. How much signal power is delivered to the load?

b) In a single stage voltage amplifier, voltage gain without feedback is 80, input resistance (Ri) = 800Ω and output resistance (Ro) is 8 KΩ. If 20% output voltage is feedback in series with input, determine A_{vf}, R_{if} and R_{of} of negative feedback amplifier.

c) The dc level of +3V is to be added to the given input signal (Vi = 5 sin wt). Name the circuit required for this and describe the working principle along with circuit diagram and input-out put waveforms.

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