



12223

**3 Hours / 70 Marks**

22329

Seat No.

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- 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.

- |  | <b>Marks</b> |
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| <b>1. Attempt any FIVE of the following :</b>  | <b>10</b>    |
| <ol style="list-style-type: none"><li>(a) Define Amplifier. Define the term voltage gain.</li><li>(b) State important features of power amplifier.</li><li>(c) Define the term 'feedback' in amplifier.</li><li>(d) State Barkhausens criteria for generation of sustained oscillations.</li><li>(e) State the meaning of positive and negative feedback with neat sketches.</li><li>(f) Explain need/necessity of heat sink.</li><li>(g) State advantages and disadvantages of transformer coupled amplifier.</li></ol> |              |
| <b>2. Attempt any THREE of the following :</b>   | <b>12</b>    |
| <ol style="list-style-type: none"><li>(a) Explain the working principle of single stage CE amplifier with help of waveform.</li></ol>  |              |



- (b) Draw a single stage transistor amplifier with voltage series negative feedback. Write its effect on voltage gain, input resistance, output resistance and harmonic distortion.
- (c) Sketch the circuit diagram of Dual Voltage Regulator using IC 78XX and 79XX to obtain  $\pm 12$  V output voltage.
- (d) Describe working of RC phase shift oscillator with neat sketch. Write formula for frequency of oscillation.

**3. Attempt any THREE of the following :**

**12**

- (a) Compare different types of power amplifier on the basis of
  - (i) Efficiency
  - (ii) Power dissipation in transistor
  - (iii) Conduction angle of collector current
  - (iv) Position of Q point.
- (b) Explain with circuit diagram the working of Class B push pull amplifier.
- (c)
  - (i) State types of LC and RC oscillators.
  - (ii) Compare LC and RC oscillators on any four points.
- (d) State the necessity of regulated power supply. Define Load and Line regulation.

**4. Attempt any THREE of the following :**

**12**

- (a) Compare small signal amplifier and power amplifier (any four points).
- (b) Draw a neat labelled diagram of a two stage RC coupled amplifier. Draw its frequency response. State its two advantages.
- (c) Draw the block diagram of voltage series and current series feedback.
- (d) Draw Miller sweep generator and give its application.
- (e) Draw the high voltage regulator using IC723 and explain its operation in brief.



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

- (a) Draw the circuit diagram of crystal oscillator. Give basic principle of piezoelectric crystal. Give advantages of crystal oscillator.
- (b) Compare class A, class B, class AB and class C with efficiency, conduction angle, Q point location and distortion.
- (c) Draw common source FET amplifier. Describe its operation. Give its application.

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

- (a) Draw circuit diagram of single tuned and double tuned amplifier. Compare single tuned and double tuned amplifier on the basis of (i) Selectivity (ii) Q-factor (iii) Bandwidth (iv) Response of gain Vs frequency.
  - (b) In single stage voltage amplifier, voltage gain without feedback is 80, input resistance  $R_i = 800 \Omega$  and output resistance  $R_o = 8k \Omega$ . If 20% output voltage is feedback in series with input, determine  $A_{vf}$ ,  $R_{if}$ ,  $R_{of}$  of the negative feedback amplifier.
  - (c) Sketch the complementary symmetry push pull amplifier and explain working with waveform.
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