

17319

21718

3 Hours / 100 Marks

Seat No.

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

Marks

1. (A) Attempt any SIX :

12

- (a) List different operating regions of transistor.
- (b) Define the term stability factor.
- (c) Draw the symbol of n-channel and p-channel JFET.
- (d) List the types of amplifier coupling.
- (e) Define intrinsic stand-off ratio of UJT.
- (f) State the need of voltage regulator.
- (g) Define efficiency of power amplifier.
- (h) State the condition for sustained oscillations.

- (B) Attempt any TWO :** **8**
- (a) Draw the circuit diagram for Common Base (CB) configuration and draw its input and output characteristics.
 - (b) List the types of transistor biasing. Draw neat circuit diagram of voltage divider biasing.
 - (c) Draw and explain zener diode as a voltage regulator.
- 2. Attempt any FOUR :** **16**
- (a) Describe the concept of thermal runaway. How it should be avoided ?
 - (b) Draw the circuit diagram of two stage RC coupled amplifier. Draw its frequency response.
 - (c) Explain the working of N-channel JFET with neat diagram.
 - (d) List the types of feedback connection. Draw block diagram representation of them.
 - (e) Draw and explain UJT relaxation oscillator with input and output waveforms.
 - (f) Draw and explain transistorised series regulator.
- 3. Attempt any FOUR :** **16**
- (a) Compare CB, CE and CC configuration on the basis of,
 - (i) Input Impedance (R_i)
 - (ii) Output Impedance (R_o)
 - (iii) Voltage gain (A_v)
 - (iv) Current gain (A_i)

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- (b) Draw the circuit diagram of self-bias method of JFET and describe its working.
- (c) Draw the circuit diagram of double tuned amplifier and describe its working.
- (d) Draw pin diagram of IC 723. Give any four important features of IC 723.
- (e) Draw and explain transistorised crystal oscillator.
- (f) Draw and explain class-B push pull amplifier.

4. Attempt any Four :

16

- (a) Define α and β of the transistor. Derive the relationship between α & β .
- (b) Compare Class A, Class B, Class C & Class AB power amplifier.
- (c) Explain the working of N-channel D-MOSFET.
- (d) Draw and explain transistor as a switch with neat input and output waveforms.
- (e) In UJT sweep circuit, calculate time period and frequency of oscillation if $\eta = 0.65$ and $R = 2 \text{ k}\Omega$.
- (f) Draw the block diagram of regulated power supply. State the function of each block.

5. Attempt any FOUR :

16

- (a) Explain the concept of dc load line analysis.
- (b) Draw the circuit diagram of single stage CE amplifier. State the function of each component.
- (c) Draw drain characteristics of JFET and explain ohmic and pinch-off region.
- (d) Draw common source FET amplifier and describe its operation.
- (e) Construct the circuit diagram of DC regulated power supply for $\pm 12\text{V}$ using IC 78XX and IC 79XX.
- (f) Draw Bootstrap amplifier and describe its working.

P.T.O.

6. Attempt any FOUR :**16**

- (a) Compare RC coupled, direct coupled and transformer coupled amplifier.
 - (b) State the meaning of positive and negative feedback. State four advantages of negative feedback.
 - (c) Define the terms Line and Load regulation.
 - (d) Draw I-V characteristics of UJT and label different regions on it.
 - (e) Draw the circuit diagram of fixed bias circuit. Write its working.
 - (f) Compare BJT and FET (any four points).
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