

# 17319

**13141**

**3 Hours / 100 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.

**Marks**

1. a) Attempt any **SIX** of the following: **12**
- i) Name operating regions of a transistor.
  - ii) Define the term stability factor.
  - iii) Define the following terms:
    - 1) Gain
    - 2) Bandwidth
  - iv) State the types of MOSFETS and draw their symbols.
  - v) Define tuned amplifier.
  - vi) Define efficiency of power amplifier.
  - vii) Draw the schematic symbol of:
    - 1) N-Channel JFET
    - 2) P-Channel JFET.
  - viii) Define intrinsic stand off ratio.

P.T.O.

**b) Attempt any TWO of the following:****08**

- i) Explain the operating principle of PNP transistor.
- ii) Explain the concept of DC load line.
- iii) Define the following:
  - 1) Load regulation
  - 2) Line regulation

**2. Attempt any FOUR of the following:****16**

- a) What is thermal runaway in transistor ? How it can be avoided ?
- b) Explain with a neat circuit voltage divider bias method for biasing a transistor.
- c) Draw the drain characteristics of JFET and explain about pinch off region and ohmic region.
- d) Draw and explain Input and Output characteristics of CB configuration.
- e) State the meaning of positive and negative feedback.
- f) Give four important features of IC 723 and list two applications of IC 723.

**3. Attempt any FOUR of the following:****16**

- a) Define  $\alpha$  and  $\beta$  of transistor and derive the relation between  $\alpha$  and  $\beta$ .
- b) Describe the self biased method for FET with a neat circuit diagram.
- c) Draw the bootstrap sweep circuit and explain it with waveforms.
- d) Compare the different types of coupling (RC coupling, Transformer coupling and Direct coupling). (Any four points).
- e) Construct a dual power supply capable of giving  $\pm 15V$  using 78XX and 79XX series IC's.
- f) Define a regulator ? Explain the need of regulator.

**4. Attempt any FOUR of the following: 16**

- a) With the help of diagram explain the working of N-Channel JFET.
- b) Draw the circuit diagram of single stage CE amplifier and state the function of each component.
- c) Describe construction and operation of E-MOSFET.
- d) Compare class A, class B and class C power amplifier (any four points).
- e) Explain class B push pull amplifier with a neat circuit diagram.
- f) Explain UJT relaxation oscillator with circuit diagram and waveforms.

**5. Attempt any FOUR of the following: 16**

- a) Compare CE, CB and CC configuration (any 4 points).
- b) State the Barkhausen criterion for the generation of sustained oscillations.
- c) Draw transformer coupled class A power amplifier.
- d) Draw common source FET amplifier. Describe its operation.
- e) State the advantages and disadvantages of crystal oscillator ?
- f) Draw the block diagram of DC power supply. Explain the function of each block.

**6. Attempt any FOUR of the following:****16**

- a) Explain base biasing with emitter feedback network.
  - b) Explain how zener diode is used as voltage regulator.
  - c) State the effect of negative feedback on following parameters:
    - i) Bandwidth
    - ii) Noise
    - iii) Gain and
    - iv) Stability.
  - d) Draw circuit diagram of single tuned amplifier with frequency response curve.
  - e) 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.
  - f) Explain the construction of UJT and draw its symbol.
-

17319

**13141**

**3 Hours / 100 Marks**

---