

17319

11718

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

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|-----------|---|--------------|
| <b>1.</b> | <b>(A) Attempt any SIX :</b>  | <b>12</b>    |
|           | <ol style="list-style-type: none"><li>(a) List any two applications of transistor.</li><li>(b) Draw symbol of n-channel and p-channel JFET.</li><li>(c) What is coupling ? List the types of amplifier coupling.</li><li>(d) Which type of feedback is used in amplifier and in oscillator ?</li><li>(e) Compare BJT &amp; UJT (any two points).</li><li>(f) List the types of biasing of transistor. Which type of biasing is used mostly ?</li><li>(g) Draw neat symbol of E-MOSFET &amp; D-MOSFET.</li><li>(h) Write any two application of tuned amplifier.</li></ol> |              |
|           | <b>(B) Attempt any TWO :</b>  | <b>8</b>     |
|           | <ol style="list-style-type: none"><li>(a) Compare CB, CE &amp; CC on the basis of<ol style="list-style-type: none"><li>(i) Input Resistance (<math>R_i</math>)</li><li>(ii) Output Resistance (<math>R_o</math>)</li><li>(iii) Current Gain (<math>A_i</math>)</li><li>(iv) Voltage gain (<math>A_v</math>)</li></ol></li></ol>   |              |

- (b) Explain working of UJT with the help of VI characteristics.
- (c) Draw labelled pin diagram of IC 78 XX and IC 79 XX. Also write the function of these IC's.

**2. Attempt any FOUR :****16**

- (a) Draw labelled Input and Output character of transistor in CE configuration.
- (b) Compare BJT & FET (any four points).
- (c) List types of feedback connection. Draw any one type of connection diagram.
- (d) What is biasing ? Explain the concept of DC load line.
- (e) Explain working of E-MOSFET with the help of neat constructional diagram.
- (f) Describe the concept of thermal runaway. How it can be avoided ?

**3. Attempt any FOUR :****16**

- (a) Explain working of transistor as a switch with neat circuit and waveforms.
- (b) Draw circuit of Zener diode as a voltage regulator and explain it's working.
- (c) List types of FET biasing and explain any one type with circuit diagram.
- (d) Describe working of single stage CE amplifier with sketch.
- (e) With the help of circuit diagram explain UJT relaxation oscillator with necessary waveforms.
- (f) Draw block diagram of DC regulated power supply and explain each block in detail.

**4. Attempt any FOUR :****16**

- (a) Draw labelled drain and transfer characteristics of JFET.
- (b) Compare class A, class B, class C power amplifier on the basis of  
(i) Operating pt. (ii) Efficiency (iii) Conduction angle (iv) nature of O/P waveforms.
- (c) Draw neat circuit of crystal oscillator and give significance of piezoelectric effect.
- (d) Draw neat circuit of two stage RC coupled amplifier and also draw its frequency response.
- (e) Describe working of Bootstrap time base generator with neat diagram and waveforms.
- (f) Draw and explain common source FET amplifier.

**5. Attempt any FOUR :****16**

- (a) Explain operation of NPN transistor with neat constructional diagram.
- (b) Define parameters of JFET
  - (i)  $r_d$
  - (ii)  $g_m$
  - (iii)  $\mu$  andDerive relation between them.
- (c) Explain working of class B push pull amplifier with i/p and output waveforms.
- (d) Enlist different types of time base generator. Write any four applications of it.

**P.T.O.**

- (e) Draw and explain transistorised series voltage regulator.
- (f) Draw neat circuit diagram of double tuned amplifier. Write any two advantages and two applications of it.

**6. Attempt any FOUR :**

**16**

- (a) List any four advantages of negative feedback.
  - (b) Define :
    - (i) Load Regulation
    - (ii) Line Regulation
  - (c) Draw neat circuit of two stage transformer coupled amplifier and draw its frequency response.
  - (d) Draw neat circuit of Miller sweep generator and explain it with waveforms.
  - (e) Describe working of RC phase shift oscillator with neat sketch. Write formula for frequency of oscillation.
  - (f) Draw neat circuit of DC regulated dual power supply for  $\pm 12$  V using IC 78 XX & IC 79 XX.
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