

17319

21819

3 Hours / 100 Marks

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.

Marks

1. (A) Attempt any SIX :

12

- (a) Name two types of BJT & draw their symbols.
- (b) Define Q-point.
- (c) State the need and types of amplifier coupling.
- (d) Draw symbol for n-channel and p-channel MOSFET.
- (e) State the necessity of tuned amplifier.
- (f) List applications of power amplifier.
- (g) Sketch p-channel JFET construction.
- (h) State the working principle of UJT.

(B) Attempt any TWO :**8**

- (a) Compare between CE, CB & CC configuration. (Any four points)
- (b) Draw the circuit diagram of based biased with emitter feedback. How stability point is obtained ?
- (c) State the need of regulation. Explain the concept of load & line regulation.

2. Attempt any FOUR :**16**

- (a) State the need of biasing and describe the concept of DC load line.
- (b) Define the following terms :
 - (i) Stabilization
 - (ii) Thermal runaway
- (c) Draw the transfer characteristics for N-channel JFET.
- (d) Draw the circuit of using transistor as a switch & explain its working.
- (e) Compare between positive and negative feedback. (four points)
- (f) List the ICs used for positive and negative voltage regulation with two example each.

3. Attempt any FOUR :**16**

- (a) In CE configuration if $\beta = 90$, leakage current $I_{CEO} = 40 \mu\text{A}$, base current is 0.4 mA , determine I_C and I_E .
- (b) Compare FET and BJT. (four points)

- (c) Draw the circuit and explain the operation of UJT relaxation oscillator.
- (d) Draw the frequency response of DC amplifier. Comment on it.
- (e) Draw the block diagram of DC regulated power supply and explain the function of each.
- (f) Draw the circuit of Zener diode as a voltage regulator and explain its working.

4. Attempt any FOUR :

16

- (a) Draw the drain characteristics of p-channel FET and explain.
- (b) Draw the multistage amplifier circuit diagram using RC coupling. State its advantages.
- (c) Draw the construction of p-channel D-MOSFET and state its working principle.
- (d) Draw the circuit diagram of complementary symmetry Class B push-pull amplifier and describe its working.
- (e) Compare between class A and class B amplifier on the basis of
 - (i) Efficiency
 - (ii) Power
 - (iii) Position of Q-point
 - (iv) O/P distortion
- (f) Draw the circuit diagram of Bootstrap's time base generator and explain its working.

P.T.O.

5. Attempt any FOUR :**16**

- (a) Draw the input and output characteristics of CE configuration.
- (b) An RC phase shift oscillator has $R = 4.7 \text{ k}\Omega$, $C = 0.01 \text{ }\mu\text{I}$, $R_1 = 1 \text{ k}\Omega$ and $R_F = 22 \text{ k}\Omega$.
 - (i) Determine whether the oscillations will be sustained.
 - (ii) What will be the frequency of oscillations ?
- (c) Draw the single stage class A power amplifier circuit diagram and draw the input and output waveforms.
- (d) State and explain the working principle of FET amplifier and list its applications.
- (e) State the basic principle of piezoelectric crystal and draw the circuit diagram of crystal oscillator.
- (f) Explain the use of IC LM723 as a voltage regulator.

6. Attempt any FOUR :**16**

- (a) Draw the circuit of voltage divider for BJT & explain its working.
 - (b) Draw the transistorized series voltage regulator circuit and explain its working.
 - (c) State and explain Barkhausen's criteria of oscillators.
 - (d) Draw the circuit of single tuned amplifier and state its operating principle.
 - (e) Draw the labelled circuit of RC phase shift oscillator. State the formula for frequency of oscillator.
 - (f) Draw the characteristics of UJT and state its working principle.
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