

17319

11920

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

Marks

1. (A) Attempt any SIX :

12

- (a) Draw symbols of npn and pnp transistors.
- (b) Define α with respect to transistor.
- (c) State applications of JFET.
- (d) State any two advantages and disadvantages of RC coupled amplifiers.
- (e) Compare positive feedback and negative feedback with reference to phase difference and noise.
- (f) Draw symbol of UJT and define intrinsic stand off ratio (η).
- (g) Define g_m and γ_d w.r. to JFET.
- (h) State Barkhausen criteria.

(B) Attempt any TWO :

8

- (a) Draw circuit diagram of CB configuration. Draw input and output characteristics.
- (b) Describe voltage divider bias method with the help of circuit diagram.
- (c) Draw the circuit of UJT relaxation oscillator. Determine value of C if $R = 1 \text{ m}\Omega$, $t = 10 \text{ ms}$. Consider $\eta = 0.65$.

[1 of 4]

P.T.O.

2. Attempt any FOUR :**16**

- (a) Draw pin configuration and block diagram of IC 723 and list its applications.
- (b) Draw circuit diagram of transistorised series voltage regulator and describe its working.
- (c) Draw and describe working of bootstrap sweep generator.
- (d) Draw the circuit of RC phase shift oscillator and describe its working.
- (e) Draw circuit diagram of negative feedback single stage voltage amplifier and describe its working.
- (f) Draw class B push pull amplifier circuit & describe its working.

3. Attempt any FOUR :**16**

- (a) How p-channel JFET is used as an amplifier ? Justify your answer along with circuit and waveforms.
- (b) Compare transformer coupling and direct coupling techniques.
- (c) Draw the construction of D type MOSFET. Describe working with I-V Characteristics.
- (d) Draw VI characteristics of JFET. Show ohmic region, saturation region and breakdown region.
- (e) Draw diagram of emitter bias method for BJT and describe its operation.
- (f) State the effect of negative feedback on following parameters :
 - (i) Bandwidth
 - (ii) Noise
 - (iii) Gain
 - (iv) Distortion

4. Attempt any FOUR :**16**

- (a) In CE configuration if $\beta = 99$, leakage current $I_{CEO} = 50 \mu\text{A}$ & if base current is 0.5 mA. Determine I_C & I_E .
- (b) Compare CB, CE and CC configuration.
- (c) Describe self bias method for FET with circuit diagram.
- (d) Draw and describe working of single tuned amplifier.
- (e) Draw the circuit diagram of zener diode as voltage regulator. Describe its working.
- (f) Draw and describe class A power amplifier.

5. Attempt any FOUR :**16**

- (a) A certain JFET has $I_{DSS} = 12 \text{ mA}$ and pinch off voltage $V_p = -6 \text{ V}$. Calculate the value of transconductance for $V_{GS} = -1 \text{ V}$.
- (b) State the types of negative feedback. Draw their block diagrams.
- (c) State specifications of 79XX series.
- (d) Describe working of transistor as a switch with neat diagram.
- (e) Define following terms with respect to time base signals :
 - (i) Sweep speed
 - (ii) Linearity
- (f) Draw circuit diagram of two stage transformer coupled amplifier. Draw its frequency response.

6. Attempt any FOUR :**16**

- (a) Draw and describe exponential sweep generator circuit.
 - (b) Draw output characteristics of CE configuration and show various regions on it.
 - (c) Name the circuit in which power dissipating component is in series with load resistance. Draw the circuit of same.
 - (d) Define line regulation and load regulation. Give the formula for regulation.
 - (e) Define stability factor of biasing circuits. Give its significance.
 - (f) Compare class A, class B, class AB and class C amplifiers with respect to
 - (i) conduction angle, (ii) position of Q point on load line.
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