

22329

24225

3 Hours / 70 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. Attempt any FIVE of the following :

10

- (a) What is coupling ? List the types of amplifier coupling.
- (b) List the types of power amplifier.
- (c) Which type of feedback is used in amplifier and oscillator ?
- (d) Draw the neat circuit of bootstrap time base generator.
- (e) State the Barkhausen criterion of oscillator.
- (f) List the application of IC 123.
- (g) Draw the circuit diagram of transistor as amplifier.

2. Attempt any THREE of the following :

12

- (a) Draw neat circuit of two stage transformer coupled amplifier and draw its frequency response.



- (b) Compare voltage series and voltage shunt feedback amplifier on following basis :
- (1) Gain stability
 - (2) Output resistance
 - (3) Bandwidth
 - (4) Noise
- (c) List advantages and disadvantages of SMPS (any two).
- (d) Draw neat circuit of Miller Sweep Generator and explain it with waveform.

3. Attempt any THREE of the following :

12

- (a) Compare Class A, Class B, Class C power amplifier on the basis :
- (1) Operating Point
 - (2) Efficiency
 - (3) Conduction Angle
 - (4) Output Waveform
- (b) Draw diagram of Class A power amplifier and explain its working.
- (c) The ac equivalent circuit of crystal has these values $L = 1\text{H}$, $C = 0.01\text{ pF}$, $R = 1000\ \Omega$ and $C_{\text{in}} = 20\text{ pF}$. Determine the series resonant and parallel resonant frequency.
- (d) Draw block diagram of SMPS, state its working principle.

4. Attempt any THREE of the following :

12

- (a) Describe cross-over distortion. Determine method of eliminate cross-over distortion.
- (b) Describe the working of single stage CE amplifier with sketch.
- (c) Compare positive feedback and negative feedback (any four points).
- (d) Draw circuit diagram of RC phase shift oscillator and describe its working.
- (e) Draw circuit diagram of DC regulated dual power supply for $\pm 12\text{ V}$ using 78XX and 79XX.

5. Attempt any TWO of the following : 12

- (a) Draw circuit diagram of crystal oscillator. Give basic principle of piezoelectric crystal. Give advantage of crystal oscillator.
- (b) Draw and explain Class B push-pull amplifier.
- (c) Describe the operation of double tuned amplifier with neat circuit diagram, frequency response, bandwidth. Give advantage and disadvantage.

6. Attempt any TWO of the following : 12

- (a) Describe the working principle of common source FET amplifier with the help of circuit diagram. Also draw the ac equivalent circuit of common source amplifier.
 - (b) With the help of expressions and block diagram, explain what will be effect of voltage series feedback on
 - (1) Input impedance of an amplifier.
 - (2) Output impedance of an amplifier.
 - (3) Gain of amplifier.
 - (4) Harmonic distortion of amplifier.
 - (c) Draw and explain single stage Class A power amplifier. Derive the expression for efficiency.
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