

313324

12526

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 answer 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) Classify Power amplifiers.
- b) Explain heat sink in Power Amplifier.
- c) Draw labelled Pin diagram of Op-Amp IC 741.
- d) State the function of level shifting stage used in Op-amp.
- e) State the Barkhausen criteria.
- f) Define roll of rate and order of filter.
- g) State the function of following pins of IC555 :-
- i) Threshold
- ii) Discharge.

P.T.O.

2. Attempt any THREE of the following: 12
- Compare different types of Power amplifier on basis of :-
 - Efficiency
 - Power dissipation in transistor
 - Conduction angle of collector current
 - Position of Q.
 - Draw the block diagram of an op-amp and write the function of each block.
 - List the types of feedback connection. Draw any one connection diagram.
 - Sketch the astable multivibrator using IC 555 and explain it.
3. Attempt any THREE of the following: 12
- Draw the circuit diagram of Op-amp as a subtractor and write the equation for output voltage.
 - Design RC phase shift oscillator using IC 741 to produce a sinusoidal output signal at $F_o = 1$ kHz. Draw designed circuit.
 - Draw ideal and practical frequency response of :-
 - Low pass filter
 - High pass filter.
 - Explain the working of IC555 as a voltage controlled oscillator (VCO).
4. Attempt any THREE of the following: 12
- Describe with help of circuit diagram working of class A power amplifier.
 - Compare integrator and differentiator. (Any four points)
 - Compare active filters and passive filters. (Any four points)
 - Explain the working of PLL as frequency multiplier using Block diagram.

5. Attempt any TWO of the following:**12**

- a) Draw and explain class B push pull amplifier with input output waveform.
- b) Draw and explain inverting zero crossing detector with neat diagram and waveforms.
- c) Comment on the effect of negative feedback on the gain, input and output resistance of the feedback amplifiers. Describe the gain bandwidth product term used in this context and its importance.
- d) Draw the second order high pass filter and describe its operations with frequency response characteristics. State the equations for cut off frequency and pass band gain.

6. Attempt any TWO of the following:**12**

- a) Explain with circuit diagram and waveform the operation of class AB push pull power amplifier.
 - b) Describe the working principle of Hartley oscillator using IC 741 with circuit diagram. Derive its formula for frequency of oscillation.
 - c) Sketch the first order Butterworth low pass filter with component values at cut-off frequency of 10 kHz with passband gain of two and draw its actual frequency response.
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