22382

12425 3 Hours / 70 Marks

Seat No.

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) Assume suitable data, if necessary.
- (5) Use of Non-programmable Electronic Pocket Calculator is permissible.
- (6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

Attempt any <u>FIVE</u> of the following: 10 a) List the types of coupling in BJT amplifiers. b) Define: Common Mode Rejection Ratio (CMRR), Supply Voltage Rejection Ratio (SVRR).

- c) Draw and label OP-amp as Adder.
- d) Draw block diagram Operational Amplifier.
- e) Draw the pin diagram of IC 555.
- f) Draw the pin diagram of IC 78XX.
- g) List two uses of heat sink for regulated power supply.

2. Attempt any THREE of the following:

- a) Explain op-amp as Schmitt trigger.
- b) Draw the circuit diagram and frequency response of two stage RC coupled amplifier and state the function of each component.
- c) Sketch the block diagram of IC 555 and state the functions of each block.
- d) Explain transfer characteristic of both ideal and practical op-amp IC 741.

3. Attempt any <u>THREE</u> of the following:

- a) Draw the circuit diagram of two stage transformer coupled amplifier and explain function of each component.
- b) Describe the working of astable multivibrator with circuit diagram and waveform using op-amp.
- c) Describe the working of Op-amp as logarithmic amplifier.
- d) Draw a pin diagram of IC 741 and state the function of pin no: 2, 7 and 6.

4. Attempt any <u>THREE</u> of the following:

- a) Draw the block diagram and explain working principle of SMPS.
- b) Draw the pin diagram of IC 565.
- c) Explain with neat circuit diagram, the significance of virtual ground in an op-amp.
- d) In the given circuit Fig No. 1, calculate the value of Vo.



Fig. No. 1

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e) For the following equation sketch the circuit diagram and output waveform for square wave input

$$V_{\circ} = R_f C_1 \frac{dV_{in}}{dt}$$

5. Attempt any <u>TWO</u> of the following:

- a) Explain Phase Lock Loop with block diagram, pin diagram and its operation.
- b) Explain with neat circuit diagram Op-amp as inverting amplifier and non-inverting amplifier.
- c) i) Compare a small signal amplifier with a power amplifier based on any two points.
 - ii) Classify the power amplifiers on the basis of operation and input/output waveforms.

6. Attempt any <u>TWO</u> of the following:

- a) Compare the fixed voltage regulators 78XX and 79XX. (Any six points)
- b) In an op-amp inverting amplifier shown in Fig. No. 2 the feedback resistor is $22k\Omega$ and input resistance is $10k\Omega$. Find the output voltage (V out) if input voltage is 2V.



Fig. No. 2

c) Explain the working of voltage controlled oscillator using IC555 with related waveforms.

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