

[Time: 3 Hours]

[ Marks:80]

Please check whether you have got the right question paper.

- N.B:**
- 1. Question no.1 is compulsory**
  - 2. Solve any three from remaining questions.**
  - 3. Assume suitable data if necessary.**
  - 4. Diagrams to be drawn neatly.**

- Q.1 A) Draw the voltage follower using op-amp and show that its gain is unity. **5**
- B) What are active filters? State its advantages over passive filters. **5**
- C) Draw the functional block diagram of op-amp and explain each block. **5**
- D) Compare comparator and Schmitt trigger. **5**
- Q.2 A) Discuss classification of active filters and explain the frequency response of each type. **10**
- B) Design a differentiator to differentiate input signal that varies in frequency from 10 Hz to about 1 kHz. **10**
- Q.3 A) Define following terms for D/A converters: i) Resolution, ii) Accuracy, iii) Monotonicity, iv) Conversion time. **10**
- B) What is comparator? Explain the characteristics of comparators. **10**
- Q.4 A) Design an inverting Schmitt trigger to achieve hysteresis of 7 Volts. Assume voltage swing =  $\pm 12$ Volts. **10**
- B) Design a RC phase shift oscillator to have output frequency of 600Hz. Use  $\pm 15$ V supply. **10**
- Q.5 A) Explain the functional block diagram of IC 723 and state its important features. **10**
- B) Explain monostable timer circuit and design a monostable 555 timer circuit to produce an output pulse 10 sec wide. **10**
- Q.6 Write short note on following.
- A) Full wave precision rectifier using op-amp **5**
- B) Three pin fixed voltage regulators. **5**
- C) High frequency effect on operation of op-amp. **5**
- D) Voltage controlled oscillators (VCO) **5**

\*\*\*\*\*