Seat No.: _____  Enrolment No. 

# GUJARAT TECHNOLOGICAL UNIVERSITY

**BE - SEMESTER– IV EXAMINATION – SUMMER 2020**

**Subject Code: 2141706** **Date:29/10/2020**

**Subject Name: ANALOG SIGNAL PROCESSING**

**Time: 10:30 AM TO 01:00 PM** **Total Marks: 70**

**Instructions:**

1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

| | | | MARKS |
|---|---|---|---|
| Q.1 | (a) | Draw only symbol and block diagram of op-amp. | 03 |
| | (b) | Enlist Ideal characteristics of an Op-Amp. | 04 |
| | (c) | Explain the following terms: (i) Input offset voltage (ii) Differential Input resistor (iii) CMRR (iv) SVRR (v) output voltage swing (vi) Large signal voltage gain (vii) Input bias current. | 07 |
| Q.2 | (a) | Explain Voltage to Current Converter with Floating Load. | 03 |
| | (b) | Draw an op-amp based differential amplifier circuit and obtain expression for its differential gain. | 04 |
| | (c) | Explain summing, scaling and averaging amplifier using Non-inverting configuration of operational amplifier. | 07 |
| | | **OR** | |
| | (c) | Derive the gain formula of Voltage shunt amplifier. | 07 |
| Q.3 | (a) | Explain Positive Clamper circuit. | 03 |
| | (b) | Draw the circuit: 1. Wide band Pass filter and 2. Narrow band pass filters. | 04 |
| | (c) | What is DAC? Draw and explain binary weighted resistor DAC. | 07 |
| | | **OR** | |
| Q.3 | (a) | Explain Positive clipper circuit. | 03 |
| | (b) | Draw the circuit diagram: (1) All pass filter. (2) High pass filter. | 04 |
| | (c) | Explain integrator circuit along with circuit diagram. | 07 |
| Q.4 | (a) | What is the offset-minimizing resistor ROM? | 03 |
| | (b) | Explain the offset voltage compensating network for non-inverting amplifier. | 04 |
| | (c) | Explain basic differentiator and practical differentiator circuit in detail. | 07 |
| | | **OR** | |
| Q.4 | (a) | Draw oscillator bock diagram and write principles. | 03 |
| | (b) | Explain the Phase shift oscillator. | 04 |
| | (c) | Explain Instrumentation amplifier using three op-amps for resistive transducer and bridge. | 07 |
| Q.5 | (a) | Explain Logarithmic amplifier. | 03 |
| | (b) | Explain Wien bridge oscillator. | 04 |
| | (c) | Draw and explain the 555 timer pin connection diagram and block diagram. | 07 |
| | | **OR** | |
| Q.5 | (a) | Explain in brief: Schmitt trigger circuit. | 03 |
| | (b) | Draw and explain the working of isolation amplifier. | 04 |
| | (c) | Explain the working of 555 timers as an astable multivibrator with block diagram and waveforms. | 07 |