

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V (Old) EXAMINATION – WINTER 2019****Subject Code: 151003****Date: 25/11/2019****Subject Name: Integrated Circuits And Applications****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.

- Q.1 (a)** Define Following terms **07**
- | | |
|---------------------------|---------------------------|
| (i) Output Offset voltage | (ii) Input Offset voltage |
| (iii) Input Bias Current | (iv) Input Offset current |
| (v) CMRR | (vi) SVRR |
| (vii) Slew Rate | |
- (b)** Draw the circuit of Voltage shunt feedback using Op. Amp. and derive the equation of Close Lop Gain A_f and Input Impedance R_{if} . **07**
- Q.2 (a)** Classify the IC based on fabrication technique. Also Explain different IC packages of Op. Amp. **07**
- (b)** Explain Differential Amplifier using one Op. Amp. and derive the equation of differential gain A_D . **07**
- OR**
- (b)** The 741C Op Amp is connected in Non inverting mode having following parameters $R_1 = 1\text{ K}\Omega$, $R_f = 10\text{ K}\Omega$, $A = 2,00,000$, $R_i = 2\text{ M}\Omega$, $R_o = 75\ \Omega$, $f = 5\text{ Hz}$ **07**
- Supply voltage = ± 15 volt ,Output voltage swing = ± 13 volt
Then compute the value of : A_f , R_{if} , R_{of} , f_F , V_{oot}
- Q.3 (a)** Explain Op. Amp. AC Amplifier using single power supply. **07**
- (b)** Explain Op. Amp. Peaking Amplifier in detail. **07**
- OR**
- Q.3 (a)** Explain Voltage to current converter **07**
- | | |
|------------------------|--|
| i. With floating load | |
| ii. With Grounded load | |
- (b)** Explain Absolute value output circuit in detail. **07**
- Q.4 (a)** Draw the Differentiator circuit and derive the equation of output voltage. Also draw practical differentiator circuit and frequency response. **07**
- (b)** Explain Sample & Hold circuit in detail with necessary waveform. **07**
- OR**
- Q.4 (a)** Draw the circuit for Square wave generator and explain it's working with necessary waveforms and equation. **07**
- (b)** Explain Differential input and differential output amplifier and derive equation of output voltage. **07**
- Q.5 (a)** Draw the circuit of first order Butter worth High Pass filter and explain it with necessary equation. Also draw it,s frequency response. **07**
- (b)** Draw the block diagram of Voltage Controlled Oscillator (VCO) and explain it's working. **07**
- OR**
- Q.5 (a)** Explain positive and negative Three Terminal Voltage Regulators. **07**
- (b)** Draw the circuit diagram of Astable multivibrator using IC 555 and explain it's working with necessary waveform and equations. **07**
