

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 Loop 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  $R_1 = 1\text{ K}\Omega$ ,  $R_f = 10\text{ K}\Omega$ ,  $A = 2,00,000$ ,  $R_i = 2\text{ M}\Omega$ ,  $R_o = 75\text{ }\Omega$ ,  $f = 5\text{ Hz}$  07
- Supply voltage =  $\pm 15\text{ volt}$ , Output voltage swing =  $\pm 13\text{ volt}$   
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

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