GUJARAT TECHNOLOGICAL UNIVERSITY
PDDC- SEMESTER–IV - EXAMINATION – SUMMER 2017

Subject Code: X41103   **Date:31/05/2017**

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)** Draw and explain block diagram of typical op-amp. Also draw equivalent circuit of it. **07**

(b) Define following terms with respect to op-amp **07**
   1) ICMR   2) CMRR   3)   Slew Rate 4)   PSSR
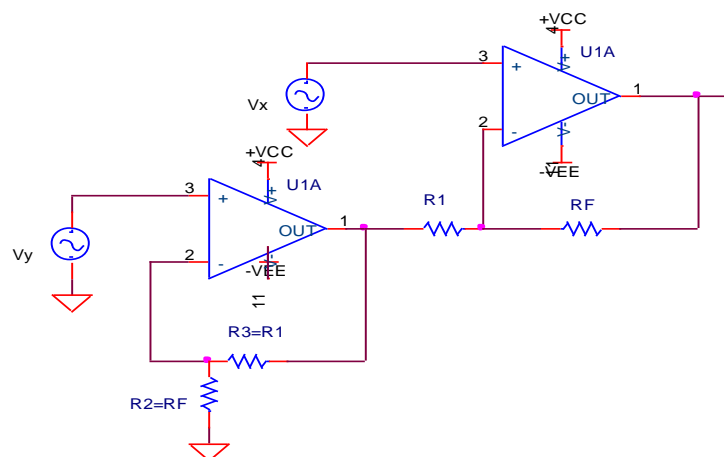   5) Bandwidth   6) Input offset voltage   7) Input bias current.

Q.2 **(a)** Define negative feedback. List types of feedback and explain voltage series feedback. **07**

(b) Draw and explain differential amplifier using one op-amp. **07**

OR

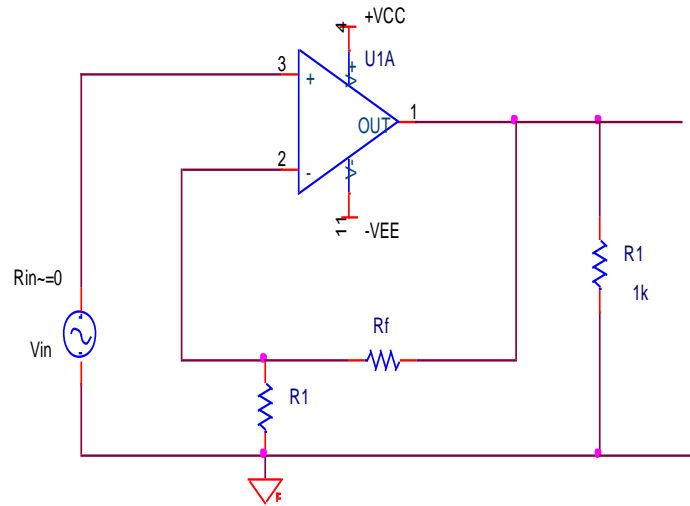**(b)** Draw and explain peaking amplifier using op-amp. **07**

Q.3 **(a)** **07**

The following specifications are given for differential amplifier of figure shown above. $R_1=R_3=680$ ohm, $R_F = R_2= 6.8$ kΩ, $V_x=$ -1.5Vpp, and $V_y=$ -2Vpp sine waves at 1kHz.The op-amp is 741C. Calculate
(a)   voltage gain and i/p resistance and
(b)   o/p voltage of amplifier. Assume o/p is initially nulled ($V_{ooT} = 0V$).

(b) Explain opamp as summing amplifier. **07**

OR

Q.3 (a) 07

741C op-amp having following parameters is connected as non-inverting amplifier, as shown in above figure, with R_1=1 KΩ and R_F=10 KΩ :
A=200,000, R_i=2 MΩ , R_O=75 Ω , $f_o \cong 5$ Hz , Supply voltage = ± 15 V
Output voltage swing = ±13V.
Compute values of A_F, R_{iF}, R_{oF}, f_F and V_{ooT}.

(b) Explain op-amp as differentiator with necessary figures. **07**

Q.4 (a) Draw sample and hold circuit diagram using op-amp. Also explain working of it. **07**

(b) Draw Schmitt trigger circuit diagram using op-amp. Also explain working of it. **07**

OR

Q.4 (a) Draw triangular and saw-toothed waveform generator circuit diagram using op-amp. Also explain working of it. **07**

(b) Explain classifications of filters. Draw Butterworth Low pass filter circuit diagram. **07**

Q.5 (a) Explain Block diagram of 555 timer IC. List applications of it. **07**
(b) Explain running ramp generator using op-amp. **07**

OR

Q.5 (a) Draw Block diagram of PLL and explain it. **07**
(b) Explain Voltage regulators. List different types of it. Also list application of it. **07**

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