

Code: EC4T6

II B.Tech - II Semester – Regular Examinations - JUNE 2014**LINEAR IC APPLICATIONS
(ELECTRONICS AND COMMUNICATION ENGINEERING)**

Duration: 3 hours

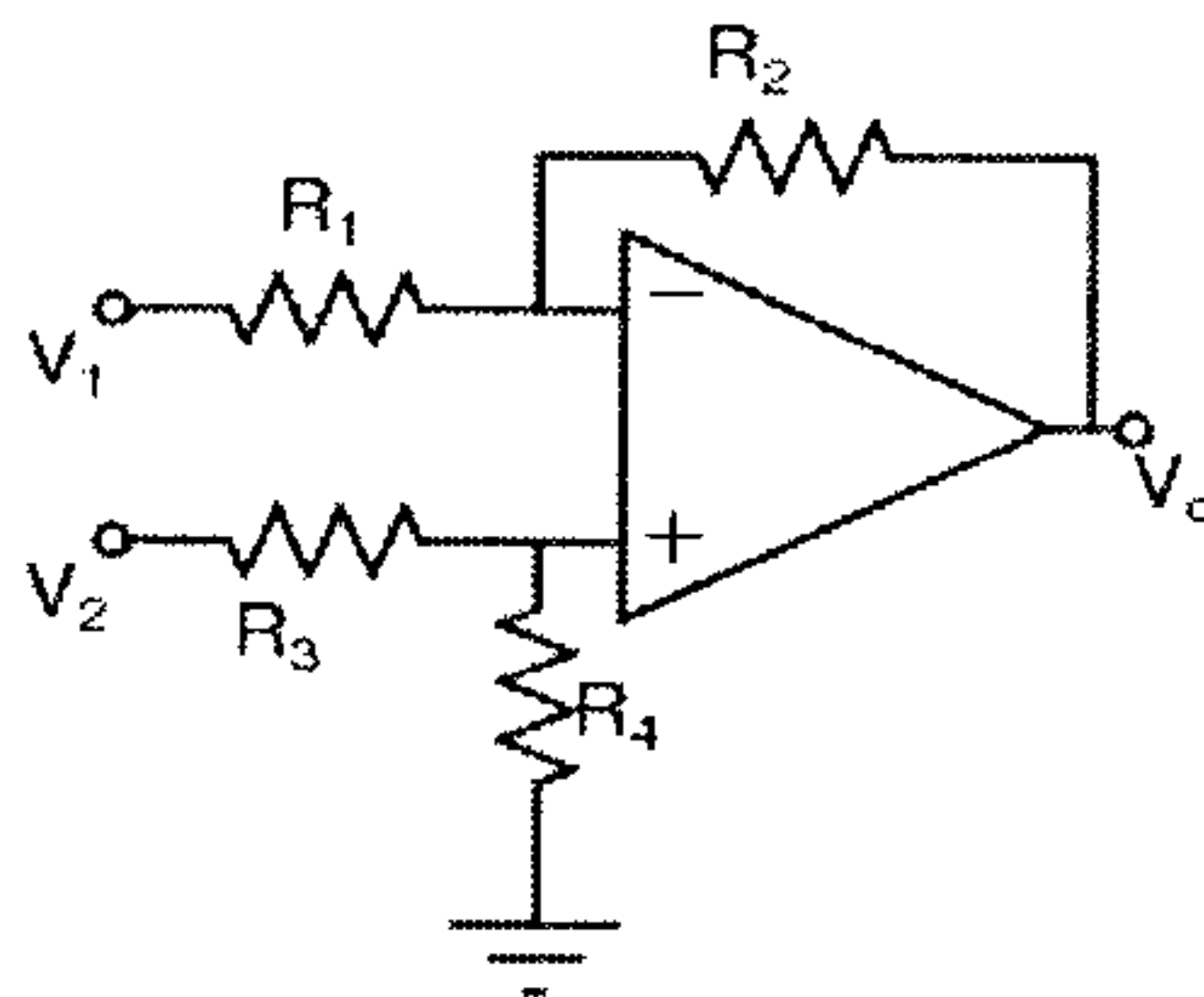
Marks: 5x14=70

Answer any FIVE questions. All questions carry equal marks

1. a) Draw the ac equivalent circuit for the dual input and balanced output differential amplifier and derive the expression for the differential input resistance . 7 M

b) Explain the AC analysis of the FET differential amplifier. 7 M

2. a) If the differential input (V_d) and common mode input (V_{cm}) to the circuit below is 10mv and 0.5mv respectively, find the output voltage V_o , Differential gain A_d and common mode gain (A_{cm}). Given $R_1=R_3=5\text{ K}\Omega$, $R_2=R_4=10\text{ K}\Omega$ assume the opamp to be ideal. 6 M



- b) Explain the following:
- | | | |
|------------------|--------------------|-----|
| (i) Input Offset | (ii) Output offset | |
| (iii) CMRR | (iv) Slew rate | |
| (v) PSRR | | 8 M |
3. a) Design an amplifier with the help of a single ideal Opamp so as to realize output voltage, $V_o = \frac{V_a + V_b + V_c}{3}$ where V_a , V_b and V_c are inputs to the amplifier. 6 M
- b) Describe about Opamp differentiator and Opamp integrator using relevant circuit diagrams and expressions. 8 M
4. a) Explain the principle of Wien Bridge oscillator with a circuit diagram and derive the expression for frequency of oscillation. 8 M
- b) Explain about Precision rectifiers with a circuit diagram. 6 M
5. a) Design an All Pass filter to have a phase shift of $\phi = -60^\circ$ for an input frequency of 1 KHz. 7 M
- b) Design a first order high pass Butterworth filter at a cutoff of 1 KHz with a passband gain of 3. 7 M

6. a) Explain about Schmitt trigger with relevant circuit diagrams, waveforms and determine an expression for Lower threshold and Higher threshold voltage. 7 M
- b) Explain the operation of Monostable Multivibrator using 555 timer. 7 M
7. a) Explain the operating principles of a 565 PLL with the help of a block diagram. Derive the expression for capture range. 7 M
- b) Write any two applications of PLL. 7 M
8. a) Explain the operation of Dual slope ADC with the help of block diagram and relevant diagram. 7 M
- b) Explain the operation of Successive approximation ADC with the help of block diagram and relevant diagram. 7 M