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BECVI

Term-End Examination

June, 2012

BIEL-038 : LINEAR INTEGRATED CIRCUITS

Time : 2 hours

Maximum Marks : 70

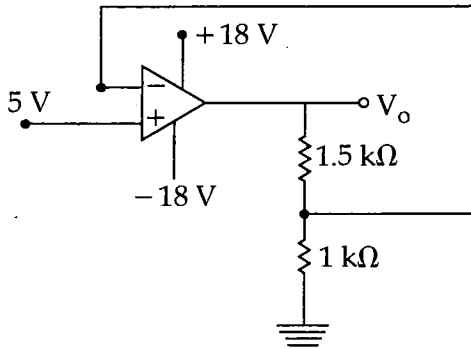
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- Note :** 1. First question is *compulsory* and attempt *any four* from the rest.
2. Use of scientific calculator is *permitted*.
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1. (a) Input impedance and output impedance of ideal OP-AMP are _____ and _____ respectively. 2
- (b) The slew rate of ideal OP-AMP is _____. 2
- (c) Voltage gain of an OP-AMP difference amplifier can be made _____ than unity. 2
- (d) At the cutoff frequency of a filter, gain drops to A_p/p where A_p is the gain in flat band and 'P' has the value : 2
- (i) 2 (ii) $\sqrt{2}$
- (iii) 3 (iv) $\sqrt{3}$

- (e) For a second order Butter worth LP filter, the damping factor is : 2
- (i) 2 (ii) $\sqrt{2}$
- (iii) $\frac{1}{\sqrt{2}}$ (iv) $\frac{1}{\sqrt{3}}$
- (f) Duty cycle of astable multivibrator for $R_a=3.3 \text{ K}\Omega$, $R_b=10 \text{ K}\Omega$ and $C=0.047 \text{ }\mu\text{F}$: 2
- (i) 0.33 (ii) 0.57
- (iii) 0.80 (iv) 0.37
- (g) Input impedance an active filter is : 2
- (i) Zero
- (ii) $100 \text{ }\Omega$
- (iii) Infinite
- (iv) in range of $\text{K}\Omega$ to $\text{M}\Omega$
2. (a) Draw ideal voltage transfer curve for OP-AMP under open loop and closed loop and explain. 8
- (b) What is slew rate ? Explain with wave form. 6
3. (a) List four basic blocks of an OP-AMP. 8
- (b) Explain the concept of virtual grounding in OP-AMP. 6

4. (a) How can OP-AMP be used as : 8
(i) a differentiator
(ii) an integrator ?
- (b) An OP-AMP inverting amplifier has an input resistor of $10\text{ K}\Omega$ and a feedback resistance of $50\text{ K}\Omega$. If the input voltage is 0.5 V , find the output voltage and input current. 6
5. (a) What is an active filter ? Write the advantages of an active filter over a passive filter. 8
- (b) Design a second order LP active filter required to have a cut-off frequency of 5 KHz . 6
6. (a) Design a monostable multivibrator for the output pulse width of 10 ms . 6
- (b) Draw neat diagram of Bi-stable multivibrator and explain the operation with the help of output waveform. 8
7. (a) Show how a band pass filter can be constructed by the use of a LP filter and a HP filter ? 8

- (b) Find the output voltage (V_o) for given circuit 6



8. Attempt *any four* of followings : $3\frac{1}{2} \times 4 = 14$
- (a) Input offset current and offset voltage
 - (b) Functions of Trigger and Discharge Pins of IC 555
 - (c) Butterworth Filter
 - (d) Pin diagram of IC 556
 - (e) Notch Filter
 - (f) CMRR of OP-AMP
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