00771

DECVI

Term-End Examination

December, 2012

BIEL-038 : LINEAR INTEGRATED CIRCUITS

Time : 2 hours *Maximum Marks : 70*

Note : *1. First question is **compulsory** and attempt **any four** from rest.*

*2. Use of scientific calculator is **permitted.***

1. (a) An OP-AMP comparator circuit employs : **2x7=14**

(i) No feedback

(ii) Positive feedback

(iii) Negative feedback

(iv) Any type of feedback

(b) The closed loop gain of an OP-AMP invertering amplifier is :

(i) Larger than unity

(ii) Less than unity

(iii) Equal to unity

(iv) Anything

(c) Duty cycle of astable MV for RA = 5 kΩ RB = 10 kΩ and C = 0.05 μF.

(i) 0.5 (ii) 0.2

(iii) 0.6 (iv) 0.75

(d) Slew rate of an ideal OP-AMP is :

(i) Zero (ii) Infinite

(iii) 1 V/μs (iv) 5 V/μs

(e) Butter worth polynomial of order 'n' has magnitude _____.

(f) The output impedance of an active filter is :

(i) In range from a fraction of an ohm to a few hundred ohms.

(ii) Infinite

(iii) Several KΩ

(iv) Several MΩ

(g) In a switched-capacitor filter, the electronics switches are :

(i) MOSFET (ii) BJT

(iii) Diode (iv) Capacitor

2. (a) State the characteristics of ideal and practical OP-AMP. **6**

(b) Derive the expressions for the voltage gain and input impedance of an inverting amplifier using OP-AMP. **8**

3. (a) What type of feedback is used in an OP-AMP adder ? Justify your answer. 6

(b) Draw the circuits of voltage to current and current to voltage convertors using OP-AMP. 8

4. (a) Discuss the effect of slew rate on bandwidth and output impedance. 6

(b) Draw neat diagram of first order HP Butter worth filter. Derive the equation for the gain of filter. 8

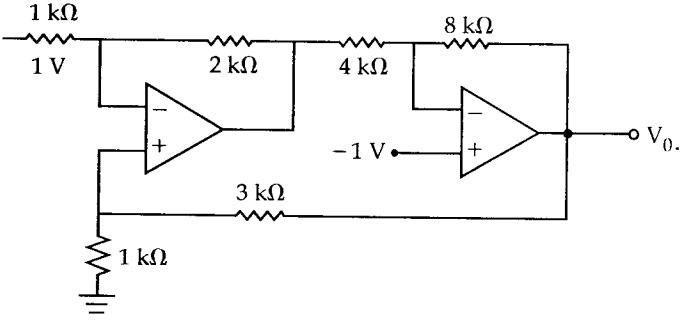
5. (a) Write the advantages of active filter over passive filter. 6

(b) Explain the operation of a switched capacitor filter. List out the advantages of a switched capacitor filter. 8

6. (a) Draw the pin diagram of IC 555. Explain the functions of different pins of IC 555. 6

(b) Draw the diagram of bistable MV and explain the operation with the help of output waveform. 8

7. (a) Find the output voltage $V_{0.}$ for given circuit. 8



(b) Design a first order Butterworth active HP filter having a cut off frequency of 200 Hz and high frequency gain of 5. **6**

8. Attempt *any four* of followings : **3.5x4=14**

(a) Slew rate and CMRR of OP-AMP

(b) Process of offset nulling in OP-AMP

(c) Concept of virtual grounding in OP-AMP

(d) Frequency response of band pass and band reject filter

(e) Notch filter

(f) Different modes of IC Timer 555