

B.E. Sixth Semester (Electronics & Telecommu., Electronics Engg.) (CGS)
10621 : Linear Integrated Circuits : 6 XT 02 / 6 XN 2

P. Pages : 2

Time : Three Hours



AU - 2775

Max. Marks : 80

- Notes:
1. Answer **three** question from Section A and **three** question from Section B.
 2. Due credit will be given to neatness and adequate dimensions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answer necessary with the help of neat sketches.
 5. Use of pen Blue/Black ink/refill only for writing the answer book.

SECTION - A

1. a) State the features of differential amplifier. 7
A typical differential amplifier has differential gain $A_d = 7000$. If the input voltages are $400\mu V$ and $300\mu V$, Calculate the output voltages for
i) $CMRR = 1000$ ii) $CMRR = 10^5$.
b) What do you mean by frequency compensation in op-amp? Explain any one method of external frequency compensation in op-amp. 7

OR

2. a) What is the importance of offset nulling in op-amp? How it is achieved in op-amp IC 741. Explain with suitable diagram. 6
b) Define the following parameters of op-amp and specify their values for op-amp IC 741 C. 8
i) Input bias current ii) Input offset voltage
iii) Unity gain Bandwidth iv) Power supply sensitivity.
3. a) Explain with circuit diagram and waveforms op-amp as inverting amplifier. Also derive the expression for its closed loop gain. 7
b) What are the requirements of a good instrumentation amplifier? Explain. 6

OR

4. a) Explain RC phase shift oscillator using op-amp. How Barkhausen criteria is fulfilled in this circuit? 6
b) Explain the op-amp as a differentiator. What are the limitations of theoretical differentiator? How are they eliminated in practical circuit? 7
5. a) Explain the op-amp as a peak-detector using improved circuit and suitable waveforms. 6
b) What do you mean by 'Order' of the active filter? Design first order Butterworth high pass filter for lower cut off frequency of $3kHz$ and pass band gain of 3. 7

OR

6. a) Explain with circuit diagram and waveforms, op-amp as astable Multivibrator. 7
b) Explain basic antilog amplifier using op-amp and diode. 6

SECTION – B

7. a) Design LM 723 based voltage regulator to fulfill following requirements. 7
 $V_0 = 5V$ at $I_0 = 1A$
 $V_{in} = 20V \pm 20\%$.
 $I_{sc} = 1.2A$, $V_{sense} = 0.7V$.
b) What do you mean by dual tracking regulator? Design a dual tracking regulator for 7
 $V_0 = \pm 6V$ using suitable ICs.

OR

8. a) Compare and contrast SMPS over the linear dissipative voltage regulator. 6
b) Draw and explain internal block schematic of voltage regulator IC LM 723. Also state its 8
important features.
9. a) Explain with circuit diagram and waveforms IC 555 as Astable multivibrator. How can we 7
achieve duty cycle below 50%.
b) What is the necessity of S/H circuit. Explain its functioning along circuit diagram. 6

OR

10. a) Design IC 555 based monostable multivibrator for output pulse width of 10ms and output 6
amplitude of 15V. Also draw suitable waveforms.
b) Draw and explain internal block schematic of IC 555 and explain the role of each block 7
and pin.
11. a) Explain with suitable diagram the basic PLL operation. Also state applications of PLL. 8
b) State important features of audio function generator IC 8038. [At least 5 features]. 5

OR

12. a) Explain the internal block schematic of PLL IC LM 565. What is free running frequency? 7
Explain.
b) Explain PLL as a frequency translator. 6
