

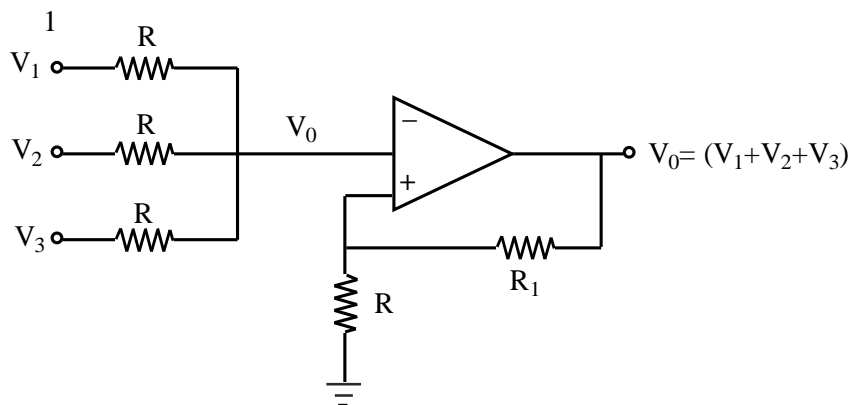


- Notes :
1. Same answer book must be used for each section.
  2. All questions carry marks as indicated.
  3. Due credit will be given to neatness and adequate dimensions.
  4. Assume suitable data wherever necessary.
  5. Illustrate your answers wherever necessary with the help of neat sketches.

1. a) What is differential amplifier? What are the types of differential amplifier configuration, discuss any one of them? **8**  
 b) Explain briefly the difference between digital and linear ICs? What is the major difference among SSI, MSI, LSI, and VLSI ICs? List and draw three types of linear IC packages? **8**

**OR**

2. a) A emitter biased dual input balanced output differential amplifier has following specification. **8**  
 $|V_{CC}| = |V_{EE}| = 10\text{V}$ ,  $R_{C1} = R_{C2} = 2.7\text{k}\Omega$ ,  $R_E = 3.9\text{k}\Omega$ , the transistor used have  $V_{BE} = 0.7\text{V}$  &  $\beta_{ac} = \beta_{dc} = 100$ . Determine.  
 i) Operating point of each transistor.  
 ii) Differential mode gain.  
 iii) Common mode gain.  
 iv) Input output impedance.  
 b) Write short notes on. **8**  
 i) Constant current bias.  
 ii) Widlar current source circuit.
3. a) Explain the working of non-inverting amplifier and derive the expression for voltage gain? **8**  
 b) Figure shows non-inverting summing amplifier circuit & its output equation, find out the relation between  $R_f$  &  $R_1$ . **8**

**OR**

4. a) Write short note on the following application of op-amp? 8  
 i) V/I converter (floating load and grounded load).  
 ii) I/V converter.
- b) Draw and explain the circuit diagram of antilog amplifier & derive its output equation? 8
5. a) Draw second order high pass Butterworth filter. Derive the expression for frequency. 8
- b) Design a second order active low-pass Butterworth filter with higher cut-off frequency 10kHz. 8

**OR**

6. a) Draw and explain the operation of square wave. 8
- b) Draw the circuit of a Wien bridge oscillator and derive an expression for its frequency of oscillation. 8
7. a) Discuss V/F and F/V converters along with its application? 8
- b) Explain zero crossing detectors and its application? 8

**OR**

8. a) Discuss the working and construction of binary weighted resistor DAC. 8
- b) Discuss the following term with reference to digital to analog converters. 8  
 i) Resolution.  
 ii) Linearity.  
 iii) Accuracy.  
 iv) Stability.
9. a) List important features of ic-555 timer? Discuss the working of IC- 555 with neat sketch? 8
- b) An astable multivibrator using IC 555.  $R_a = 2.2k, R_b = 3.9k, C = 0.1\mu f$ . Determine the positive pulse width  $t_c$ , negative pulse width  $t_d$ . And free running frequency  $f$ . 8

**OR**

10. a) Draw the block diagram of IC 723 voltage regulator and explain working each block? 8
- b) Write short note on. 8  
 i) Adjustable regulator using 78xx.  
 ii) Switching regulator.  
 iii) LM 565 PLL.

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