

Con. 5208-09.

(REVISED COURSE)

SP-7442

(3 Hours)

[ Total Marks : 100

**N.B. :** (1) Question No. 1 is compulsory.

(2) Attempt any four questions out of remaining six questions.

(3) Assume suitable data if necessary.

(4) Figures to the right indicate full marks.

1. (a) Explain the criterion for selecting suitable biasing network for the BJT amplifier. 5  
(b) Draw the circuit diagram and explain the operation of dual input balanced output differential amplifier. 5  
(c) With the help of block diagram, explain the operation of OPAMP. 5  
(d) State and explain Barkhusen's criterion for oscillators. 5
2. (a) Explain the working of 3 - OPAMP instrumentation amplifier. Derive the expression for output voltage. 10  
(b) Draw the circuit diagram and explain the operation of RC phase shift oscillator. 5  
(c) Design the RC phase shift oscillator for 200 Hz frequency. 5
3. (a) Draw the circuit diagram and explain the operation of Integrator. What are the limitations of basic circuit? How they are overcome in practical circuit? 10  
(b) Draw the circuit diagram and explain the operation of triangular wave generator using OPAMP. 10
4. (a) A 6 bit DAC has an input 100 101 and 10V reference voltage. Find – 10  
(i) Output Voltage (ii) Conversion Resolution.  
(b) Design astable multivibrator using IC 555 for  $f_0 = 1$  KHz, duty cycle = 25%. 10
5. (a) What are advantages of active filters? With the help of circuit diagram, explain the operation of Second Order Low Pass filter. 10  
(b) Draw the circuit diagram and explain the operation of mono stable multivibrator. 10

6. (a) Draw the circuit diagram and explain the operation of high voltage regulator using IC 723. **6**  
 (b) Differentiate between linear and switching regulator. **4**  
 (c) Derive the expression for stability factor 's' for different BJT biasing circuits. **10**
7. (a) Write a program for SPICE simulation of Non-inverting amplifier. **10**  
 (b) For the differential amplifier determine  $I_{CQ}$ ,  $V_{CEQ}$ ,  $A_d$ ,  $A_c$ ,  $C_{MRR}$  if  $h_{ie} = 1k$ ,  $h_{fe} = 100$ ,  $V_{BE} = 0.6 V$ . **10**

