

Con. 2516-09.

VR-3387

(REVISED COURSE)

(3 Hours)

[Total Marks : 100]

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

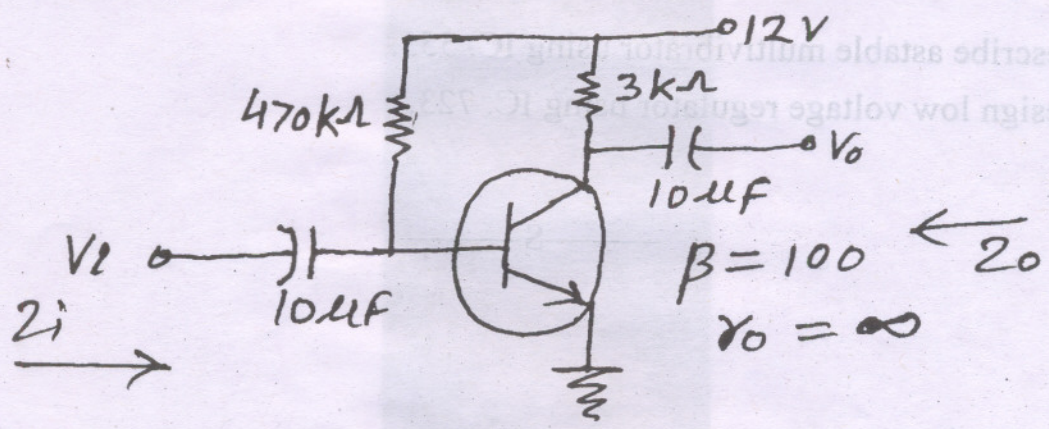
(2) Attempt any four questions out of remaining Six questions.

(3) Assume suitable data wherever required but justify the same.

(4) Figures to the right indicate full marks.

1. (a) Derive the equations for  $z_i$ ,  $z_o$ ,  $A_v$  and  $A_i$  for the circuit shown below in (b). 10

(b) Determine  $z_i$ ,  $z_o$ ,  $A_v$  and  $A_i$  for the circuit shown below. 10



2. For the Dual-Input, balanced output differential amplifier, determine :— 20

(a) Differential mode gain ( $A_d$ )

(b) Common mode gain ( $A_a$ )

(c) CMRR

(d) Differential Input Resistance

(e) Output Resistance.

3. (a) Draw and explain block diagram of a typical opamp. Define following terms 10 w.r.t opamp.

(i) Supply voltage rejection ratio

(ii) CMRR

(iii) Slew rate.

(b) (i) Describe Summing Amplifier. 10

(ii) Describe Zero crossing detector.

4. (a) Describe Instrumentation amplifier in detail. 10  
(b) What are the drawbacks of basic differentiator and how it is overcome in practical differentiator? 10
5. (a) Describe in details second order low pass Butterworth filter. 10  
(b) What is Barkhausen criterion? Derive equations for frequency of oscillations of RC phase shift oscillator using BJT. 10
6. (a) Describe Schmitt trigger in detail. 10  
(b) Describe A/D Converter using successive approximation resistor method. 10
7. (a) Describe astable multivibrator using IC. 555. 10  
(b) Design low voltage regulator using IC. 723. 10