

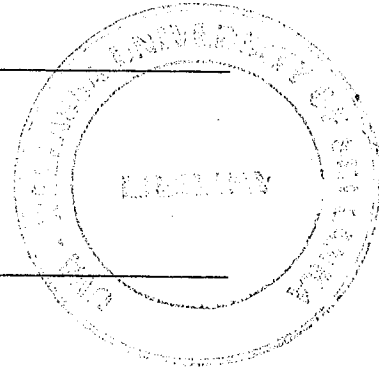
(2)

Uva Wellassa University, Sri Lanka
End Semester Examination – January 2010
SCT 361-2 Digital and Analogue Electronics
Time: Two (02) hours



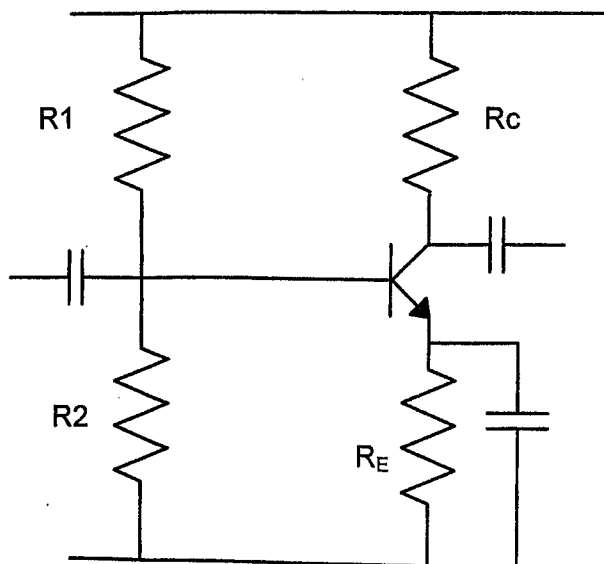
Total 04 Questions

Answer All Questions



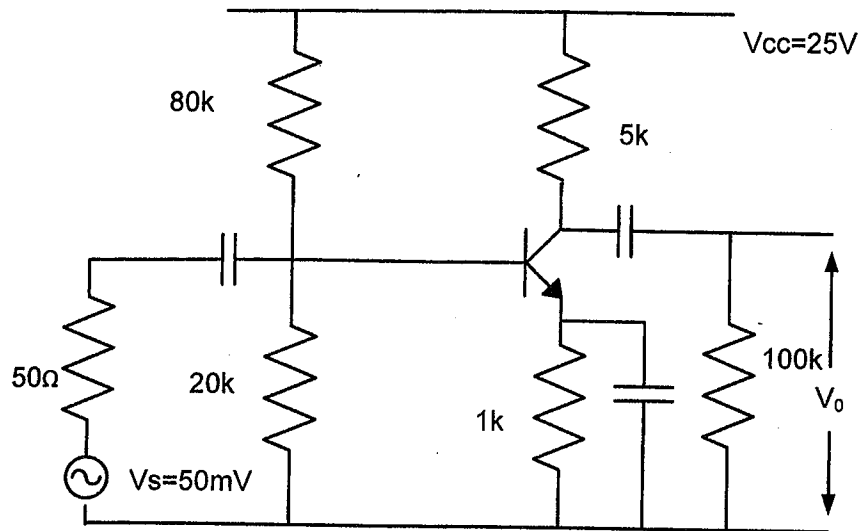
01)

- I. What are the three terminals in transistor?
- II. Describe Input characteristic and output characteristic of the common emitter transistor circuit
- III.



The potential divider circuit is shown in the above and the find the value of R_1 . You should have consider the $I_B = 50\mu A$ and $I_E = 2mA$. $V_{BE} = 0.5V$, $R_2 = 10K$, $R_E = 1k$ and $V_{cc} = 10V$.

02)



If $h_{fe}=100$, $h_{ie}=2k\Omega$, $h_{re}=h_{oe}=0$ and $V_{BE}=0.6V$.

- I. Draw the small signal AC equivalent circuit and determine the output voltage.
- II. Calculate the values of voltage gain A_v , current gain A_i and power gain A_p .

03)

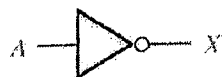
- I. Describe the properties of an ideal operational amplifier
- II. Draw the circuit diagrams for the applications listed below and in each case obtain the relationship between the input and output signals.
 - a) Inverting amplifier
 - b) Non-inverting amplifier
 - c) Summing amplifier
 - d) Integrator
 - e) Differentiator

04)

I. Write the Boolean expression for each of the following logic gates.



(a)



(b)



(c)



(d)

II. Write the Demorgan's theorems and apply Demorgan's theorem to simplify following expressions.

(a) $\overline{AB(C + \overline{D})}$

(b) $\overline{AB(CD + EF)}$

(c) $\overline{(A + \overline{B} + C + \overline{D}) + \overline{ABCD}}$

(d) $\overline{(\overline{A} + B + C + D)(\overline{ABCD})}$

(e) $\overline{AB(CD + \overline{EF})(\overline{AB} + \overline{CD})}$

III. Using Boolean algebra, simplify following expressions

(a) $BD + B(D + E) + \overline{D}(D + F)$

(b) $\overline{A}\overline{B}C + \overline{(A + B + \overline{C})} + \overline{A}\overline{B}\overline{C}D$

(c) $(B + BC)(B + \overline{B}C)(B + D)$

(d) $ABCD + AB(\overline{CD}) + (\overline{AB})CD$

(e) $ABC[AB + \overline{C}(BC + AC)]$

