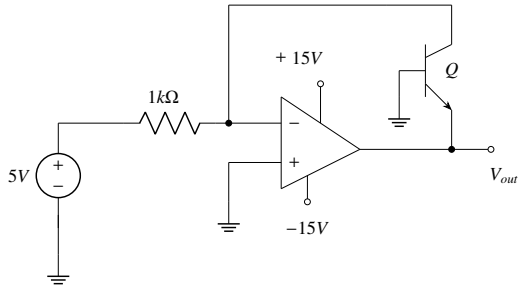
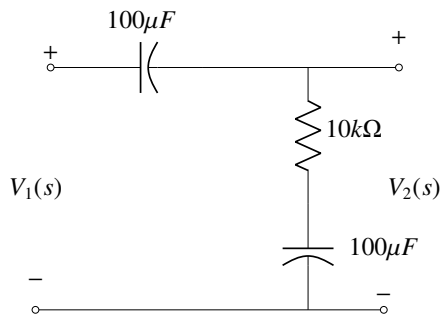


- 1) In the circuit shown below what is the output voltage ( $V_{out}$ ) in Volts if a silicon transistor  $Q$  and an ideal op-amp are used? (2013-EE)



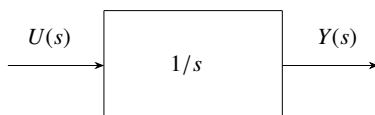
- [illegible]

- 2) The transfer function  $\frac{V_2(s)}{V_1(s)}$  of the circuit shown below is (2013-EE)



- a)  $\frac{0.5s+1}{s+1}$  c)  $\frac{s+2}{s+1}$   
b)  $\frac{3s+6}{s+2}$  d)  $\frac{s+1}{s+2}$

- 3) Assuming zero initial condition, the response  $y(t)$  of the system given below to a unit step input  $u(t)$  is





- a)  $-2$                       b)  $-0.5$                       c)  $+0.5$                       d)  $+2$

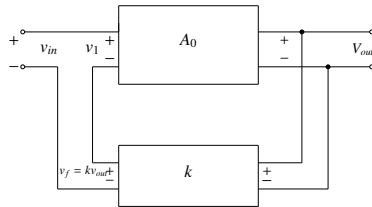
11) A continuous random variable  $X$  has a probability density function  $f(x) = e^{-x}, 0 < x < \infty$ . Then  $P\{X > 1\}$  (2013-EE)

- a) 0.368                      b) 0.5                      c) 0.632                      d) 1.0

12) The curl of the gradient of the scalar field defined by  $V = 2x^2y + 3y^2z + 4z^2x$  is (2013-EE)

- a)  $4xy\mathbf{a}_x + 6yz\mathbf{a}_y + 8zx\mathbf{a}_z$   
 b)  $4\mathbf{a}_x + 6\mathbf{a}_y + 8\mathbf{a}_z$   
 c)  $(4xy + 4z^2)\mathbf{a}_x + (2x^2 + 6yz)\mathbf{a}_y + (3y^2 + 8zx)\mathbf{a}_z$   
 d) 0

13) In the feedback network shown below, if the feedback factor  $k$  is increased, then the (2013-EE)



- a) input impedance increases and output impedance decrease  
 b) input impedance increases and output impedance also increase  
 c) input impedance decrease and output impedance also decrease  
 d) input impedance decreases and output impedance increases