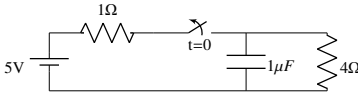


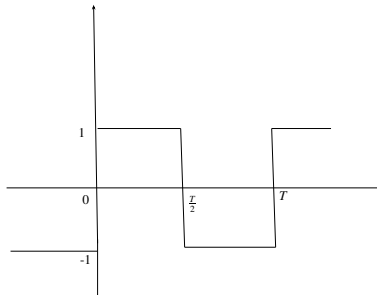
# 2010-EE-1-13

EE24BTECH11006 - Arnav Mahishi

- 1) The value of the quantity  $P$ , where  $P = \int_0^1 x e^x$  is equal to
  - a) 0
  - b) 1
  - c)  $e$
  - d)  $\frac{1}{e}$
- 2) Divergence of the three-dimensional radial vector field  $\vec{r}$ 
  - a) 3
  - b)  $\frac{1}{r}$
  - c)  $\hat{i} + \hat{j} + \hat{k}$
  - d)  $3(\hat{i} + \hat{j} + \hat{k})$
- 3) The period of the signal  $x(t) = 8 \sin\left(0.8t + \frac{\pi}{4}\right)$  is
  - a)  $0.4\pi s$
  - b)  $0.8\pi s$
  - c)  $1.25s$
  - d)  $2.5s$
- 4) The system represented by the input-output relationship  $y(t) = \int_{-\infty}^t x(\tau) d\tau, t > 0$  is
  - a) Linear and casual
  - b) Linear but non casual
  - c) Casual but not linear
  - d) Neither linear nor casual
- 5) The switch in the circuit has been closed for a long time. It is opened at  $t = 0$ . At  $t = 0^+$ , the current through the  $1\mu F$  capacitor is.
 

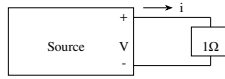


  - a) 0A
  - b) 1A
  - c) 1.25A
  - d) 5A
- 6) The second harmonic component of the periodic waveform given in the figure has an amplitude of



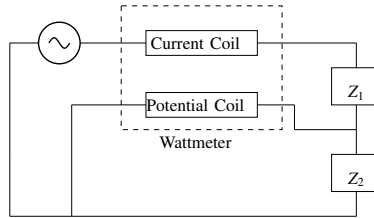
- a) Normal                      b) Gamma                      c) Beta                      d) Cauchy

- 7) As shown in the figure, a resistance  $1\Omega$  resistance is connected across a source that has a load line  $v + i = 100$ . The current through the resistance is



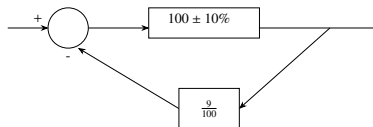
- a) 25A                      b) 50A                      c) 100A                      d) 200A

- 8) A wattmeter is connected as shown in the figure. The wattmeter reads



Text

- a) Zero always                      c) Power consumed by  $Z_1$   
 b) Total power consumed by  $Z_1$  and  $Z_2$                       d) Power consumed by  $Z_2$
- 9) An ammeter has current range  $0 - 5A$  and its internal resistance is  $0.2\Omega$ . In order to change the range to  $0 - 25A$ , we need to add a resistance of
- a)  $0.8\Omega$  in series with the meter.                      c)  $0.04\Omega$  in parallel with the meter.  
 b)  $1.0\Omega$  in series with the meter.                      d)  $0.05\Omega$  in parallel with the meter.
- 10) As shown in the figure, a negative feedback system has an amplifier of gain 100 with  $\pm 10\%$  tolerance in the forward path, and an attenuator of value  $\frac{9}{100}$  in the feedback path. The overall system gain is approximately.

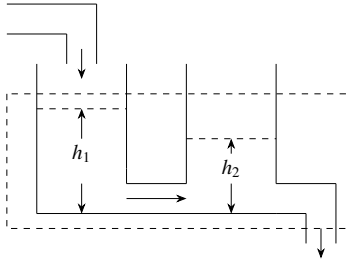


- a)  $10 \pm 1\%$                       b)  $10 \pm 2\%$                       c)  $10 \pm 5\%$                       d)  $10 \pm 10\%$

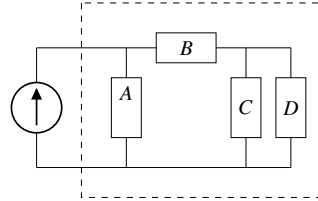
- 11) For the system  $\frac{2}{s+1}$ , The approximate time taken for a step response to reach 98% of its final value is

a)  $1s$ b)  $2s$ c)  $4s$ d)  $8s$ 

12) If the electrical circuit of figure(b) is an equivalent of the coupled tank system of figure(a), then



(a) Coupled Tank



(b) Electrical Equivalent

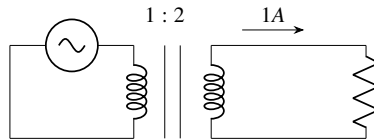
a)  $A, B$  are resistances and  $C, D$  are capacitances

b)  $A, C$  are resistances and  $B, D$  are capacitances

c)  $A, B$  are resistances and  $C, D$  are capacitances

d)  $A, C$  are resistances and  $B, D$  are capacitances

13) A single-phase transformer has turns ratio of  $1 : 2$  and is connected to a purely resistive load as shown in the figure. The magnetizing current drawn is  $1A$  and the secondary current is  $1A$ . If core losses and leakage reactances are neglected, the primary current is

a)  $1.4A$ b)  $2A$ c)  $2.24A$ d)  $3A$