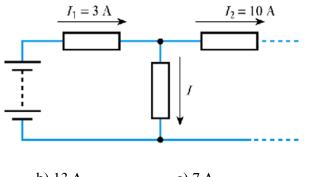
Problem set 1 TFY4185 Måleteknikk Issued 2 September 2015

- 1. Which of the following is a correct statement of Ohm's law?
 - a) I = R / V
- b) I = V / R
- c) V = I / R
- d) R = VI

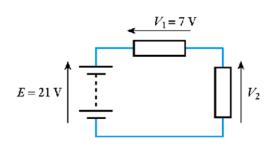
2. Calculate the current I in the following circuit:



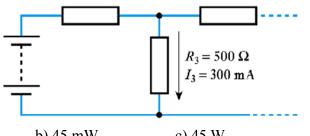
a) -7 A

- b) 13 A
- c) 7 A
- d) 13 A

3. Calculate the voltage V2 in the following circuit:

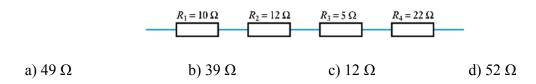


- a) 28 V
- b) -14 V
- c) 14 V
- d) -7 V
- 4. Calculate the power dissipated in R3 in the following circuit:

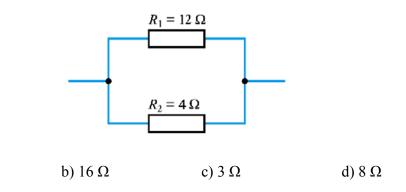


- a) 150 mW
- b) 45 mW
- c) 45 W
- d) 150 W

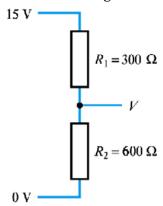
5. Calculate the effective resistance of the following combination:



6. Calculate the effective resistance of the following combination:



7. Calculate the output voltage V of the following circuit:

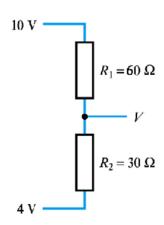


a) 10 V

a) 6 Ω

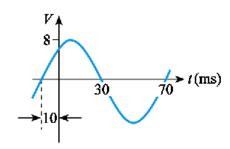
- b) 3 V
- c) 5 V
- d) 6 V

8. Calculate the output voltage V of the following circuit:

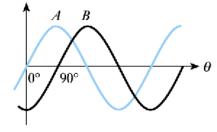


a) 2 V

- b) 4 V
- c) 6 V
- d) 8 V
- 9. Which of the following equations describes the waveform shown here?

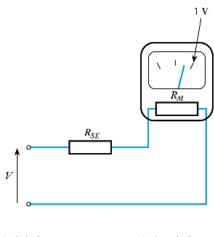


- b) $v = 8 \sin (79t \pi / 4)$
- a) $v = 8 \sin (90t \pi / 4)$ c) $v = 8 \sin (79t + \pi / 4)$
- d) $v = 8 \sin (90t + \pi / 4)$
- 10. In the following graph, waveform A lags waveform B by 90 degrees. True or false?

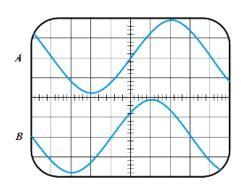


- 11. What is the average value of a sinusoidal voltage that has a peak value of 15 V?
 - a) 0 V

- b) 9.56 V
- c) 10.6 V
- d) 19.1 V
- 12. A current of 5 A r.m.s is passed through a resistor of 5 Ω . What power will be dissipated in the resistor?
 - a) 20 W
- b) 50 W
- c) 100 W
- d) 200 W
- 13. A moving-coil meter produces a full-scale deflection for a current of 100 μA and has a resistance of 500 Ω . Select a series resistor to turn this device into a voltmeter with an full scale deflection of 1 V.

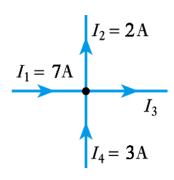


- a) $8.5 \text{ k}\Omega$
- b) $9 k\Omega$
- c) $9.5 \text{ k}\Omega$
- d) $10 \text{ k}\Omega$
- 14. What is the relationship between the two waveforms shown here?



- a) A leads B by $\pi/4$
- b) A lags B by $\pi/2$
- c) A lags B by $\pi / 4$
 - d) A leads B by $\pi/2$

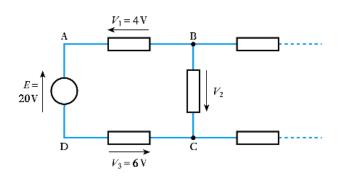
15. Calculate the current I_3 in the following circuit.



a) -8 A

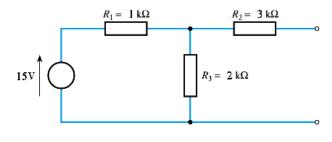
- b) -2 A
- c) 2 A
- d) 8 A

16. Calculate the voltage V_2 in the following circuit.



- a) -10 V
- b) 10 V
- c) 12 V
- d) 18 V

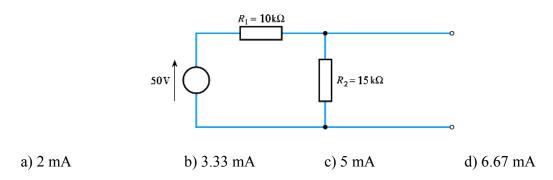
17. Determine the open-circuit output voltage of the following circuit.



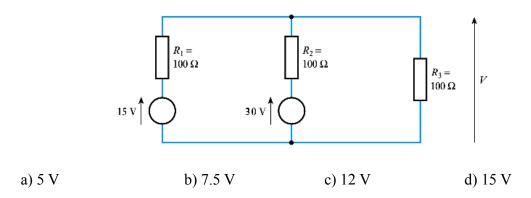
a) 5 V

- b) 6.82 V
- c) 8.18 V
- d) 10 V

18. Determine the short-circuit current of the following circuit.



19. Use the principle of superposition to determine the output voltage V of the following circuit (you should be able to do this using mental arithmetic).



20. How many meshes are present within the following circuit?

