Name: _____
Group: _____

Future Technologies Industry Cluster
College of VE, RMIT University
AD026
Electrical Principles EEET 2276

Tutorial # 2a

Topics included in this tutorial are covered in the lectures of weeks 1 & 2 as shown below:

1. **Electrical fundamental quantities**
2. **Resistors and color code**
3. **Ohm's Law**
4. **Series circuits**
5. **Parrallel circuits**
6. **Series – Parallel circuits**

1. The energy expended in moving a charge of 30 coulomb through a potential difference of 0.6 volts is:

   (a) 0.50 joules
   (b) 10 joules
   (c) 18 joules
   (d) 12 joules

a
b
c
d

2. If 0.18 coulomb of charge passes by a point every 7.5 ms then the current in amperes is equal to:

   (a) 24 Amps
   (b) 15 Amps
   (c) 1 Amps
   (d) 0 Amps

a
b
c
d

3. Cutting the area of a conductor in half

   (a) cuts the resistance in half
   (b) doubles the resistance
   (c) increases resistance 4 times
   (d) decreases resistance 4 times

a
b
c
d

4. A 560 Ω with ± 5% tolerance resistor has the following colour code:

(a) green, blue, red, red
(b) green, blue, black, brown
(c) green, blue, brown, silver
(d) green, blue, brown, gold

a
b
c
d

5. A 20 kΩ resistor has a conductance of:

(a) 7×10^{-3}
(b) 6×10^{6}
(c) 5×10^{-5}
(d) 4×10^{5}

a
b
c
d

6. Four 220 Ω, ±5% resistors are measured with an ohmmeter. One of the measured resistor values is not within the ±5% tolerance. Which one of the following readings is out of bounds?

(a) 207 Ω
(b) 210 Ω
(c) 218 Ω
(d) 228 Ω

a
b
c
d

7. A resistor has colour bands brown, black, silver and gold. The value of this resistor equals to:

(a) 0.1 Ω ±10%
(b) 1 Ω ±20%
(c) 100 Ω ±1%
(d) 0.1 Ω ±5%

a
b
c
d

8. A clock has an internal resistance of 8.2k Ω. The current through the clock if it is powered by a 220V outlet equals to:

(a) 1 mAmp
(b) 26.83 mAmp
(c) 50 Amp
(d) 2 Amp

a
b
c
d

9. A system with an input power of 70 watts and an output power of 25 watts has an efficiency in percent of

(a) 1%
(b) 35.7%
(c) 2.8%
(d) 50%

a
b
c
d

10. How many joules of energy will a 15 watts lamp dissipates in one hr?

(a) 54000 joules
(b) 540 joules
(c) 5400 joules
(d) 54 joules

a
b
c
d

11. If a voltage in a circuit changes from 4 V to 8 V and the current in the same circuit changes from 3 mA to 5 mA, the resistance of the circuit is:

(a) 5 Ω
(b) 1 kΩ
(c) 10 Ω
(d) 2 kΩ

a
b
c
d

12. For the circuit shown in Fig 1, the equivalent resistor for this circuit is:

(a) 3 kΩ
(b) 0 Ω
(c) 4.4 kΩ
(d) 2 Ω

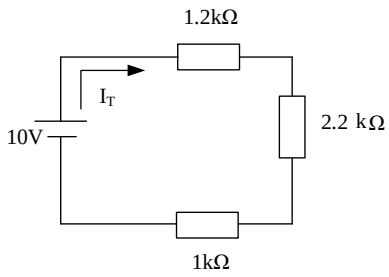

Fig 1

a
b
c
d

13. For the same circuit shown in Fig 1, the total current flowing from the battery equals to:

(a) 5.1 mAmp
(b) 2.27 mAmp
(c) 10 mAmp
(d) 2.5 mAmp

a
b
c
d

14. For the same circuit shown in Fig 1, the total power dissipated in the circuit equals to

(a) 11.5 mW
(b) 22.7 mW
(c) 2.1 mW
(d) 0 mW

a
b
c
d

15. For the circuit shown in Fig 2, the power dissipated by R5 is equal to:

(a) 4 mW
(b) 5 mW
(c) 10 mW
(d) 11 mW

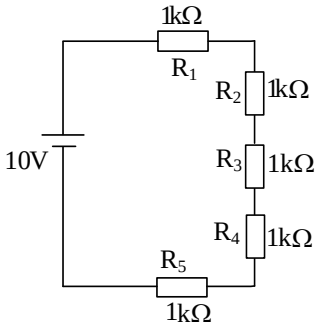

Fig 2

a
b
c
d

16. For the circuit shown in Fig 2, if R_3 is short-circuited, how much power is dissipated in the circuit?

(a) 0.15 W
(b) 1 W
(c) 0.025 W
(d) 10 W

a
b
c
d

17. For the circuit shown in Fig 3, state which of the following KVL equations is correct:

(a) $+10 + V_1 + V_2 - 15 + V_3 = 0$
(b) $+10 - V_1 - V_2 - 15 - V_3 = 0$
(c) $-10 - V_1 - V_2 + 15 - V_3 = 0$
(d) $+10 - V_1 - V_2 + 15 - V_3 = 0$

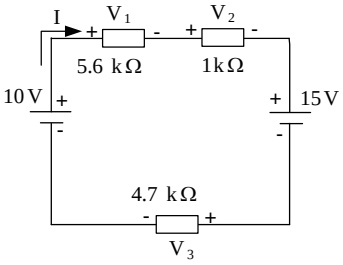

Fig 3

a
b
c
d

18. If the voltage drop across a resistor increases by a factor of 2 (double), the power dissipated by the resistor

(a) increases by a factor of 4
(b) increases by a factor of 200.
(c) increases by a factor of 10
(d) decreases.

a
b
c
d

19. For resistors in a series circuit, state which of the following statements is correct.

(a) Each resistor dissipates the same power, regardless of its resistance value.
(b) Large-value resistors dissipate more power than small-value resistors,
(c) Small-value resistors dissipate more power than large-value resistors
(d) The smallest resistor drops the largest voltage

a
b
c
d

20. Kirchhoff's current law states that:

(a) the sum of the currents around a closed loop is zero
(b) the sum of the currents entering a junction must equal the sum of the currents leaving the junction
(c) the sum of the currents entering a junction must equal zero
(d) the total current entering a given junction is constant, even with changes in supply voltage.

a
b
c
d

21. As shown in Fig 4, a 6.8 kΩ resistor and a 2.2 kΩ resistor are connected in parallel across a 10 V battery. The total resistance of the circuit is:

(a) 2.7 kΩ
(b) 1.662 kΩ
(c) 9 kΩ
(d) 1 kΩ

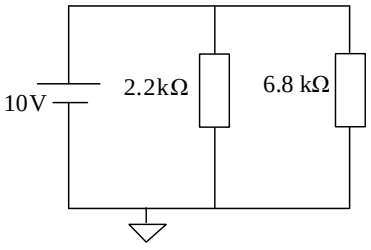

Fig 4

a
b
c
d

22. For the circuit shown in Fig 4,the current flowing in the circuit is equal to:

(a) 3 mA
(b) 1 mA
(c) 4 mA
(d) 6 mA

a
b
c
d

23. For the circuit shown in Fig 5, the total resistance R_T equals to:

(a) 5.1 kΩ
(b) 12.5 kΩ
(c) 1.23 kΩ
(d) 4.5 kΩ

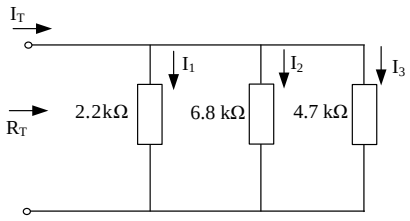

Fig 5

a
b
c
d

24. For the circuit shown in Fig 5, if the total current I_T = 10mA then I_2 equals to:

(a) 1.5 mA
(b) 1.8 mA
(c) 1.0 mA
(d) 10 mA

a
b
c
d

25. For the circuit shown in Fig 6:

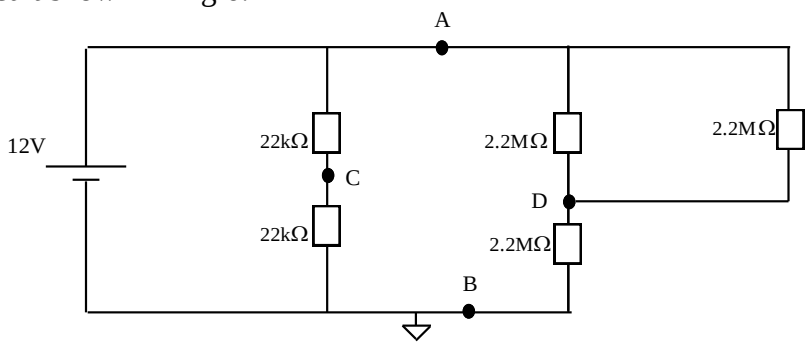

Fig 6

Complete Table 1 (show all calculation)

Table 1

V_{AB} =	V_{AD} =
	V_{DB} =
	V_{CB} =

26. For the circuit shown in Fig 7:

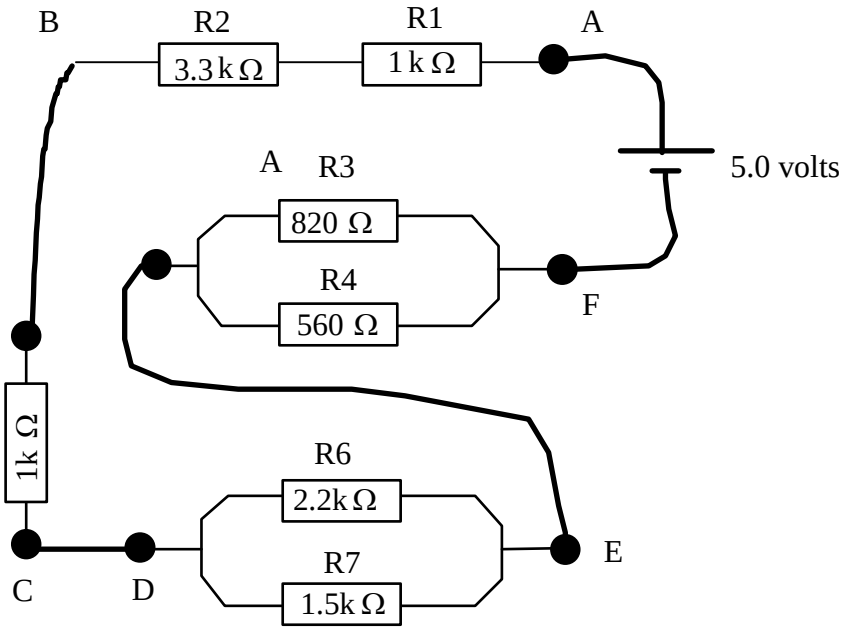

Fig 7

a. Calculate the equivalent resistance of the circuit. (Show all work).

b Calculate the total current in the circuit.

27. For the circuit shown in Fig 8:

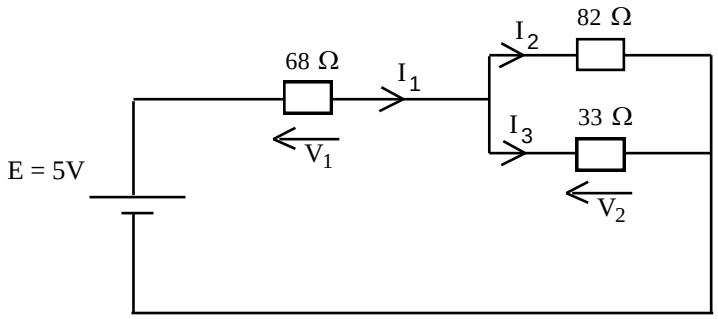

Fig 8

a. Calculate currents I_1, I_2, I_3 and voltages V_1 & V_2