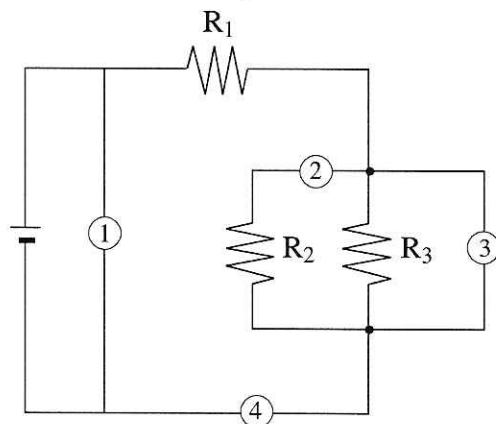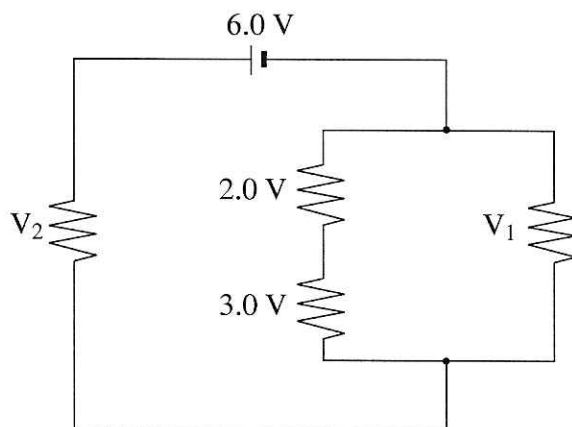25. The diagram below shows a circuit with four possible meter locations.

In which locations should an ammeter and voltmeter be connected to correctly measure the current through R_2 and the voltage drop across R_2 ?

	CURRENT THROUGH R_2	VOLTAGE DROP ACROSS R_2
A.	2	1
B.	2	3
C.	4	1
D.	4	3

26. What are the potential differences, V_1 and V_2, in the circuit shown below?

	Potential Difference V_1	Potential Difference V_2
A.	1.0 V	5.0 V
B.	1.0 V	6.0 V
C.	5.0 V	1.0 V
D.	5.0 V	5.0 V

27. A 2.50W device requires 1.20V to operate properly. A 1.45V cell, with internal resistance r, is used to power this device. What value of r enables the cell to provide 1.20V to the device?


$\mathcal{E} = 1.45\,V$

r

$P = 2.50\,W$
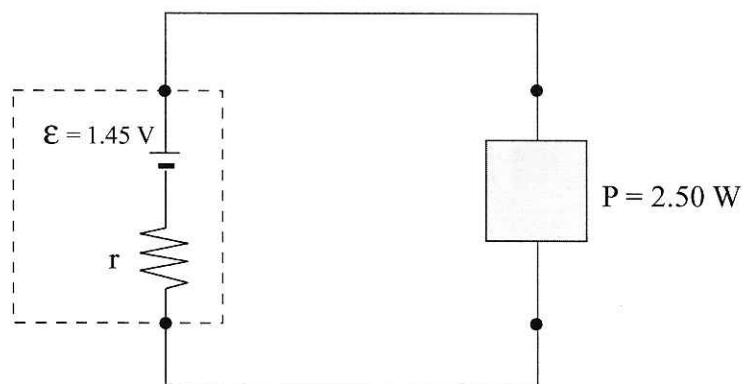
A. $0.120\,\Omega$
B. $0.145\,\Omega$
C. $0.576\,\Omega$
D. $0.841\,\Omega$

28. A 660 W electric heater is designed to operate from a 120 V source. If the source voltage drops to 80.0 V, what will be the power dissipated by the same heater? (Assume the resistance of the heater is constant.)

A. 73.3 W
B. 293 W
C. 440 W
D. 660 W

29. The total resistance between points X and Y is 14.0 Ω. What is the value of R?

R

X   8.0 Ω 20 Ω Y

60 Ω
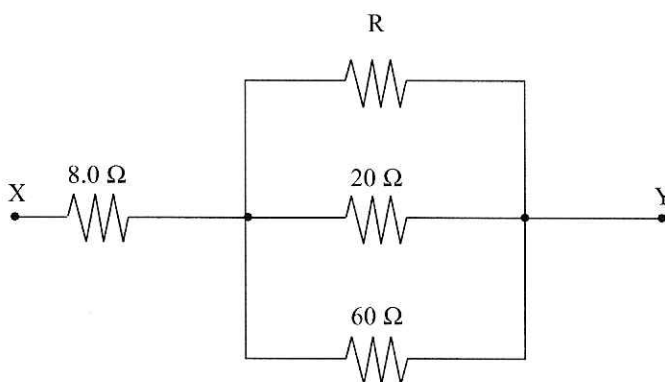
A. $6.0\,\Omega$
B. $8.3\,\Omega$
C. $10\,\Omega$
D. $210\,\Omega$

30. In the circuit shown below, voltmeter readings are taken when switch S is closed and open.
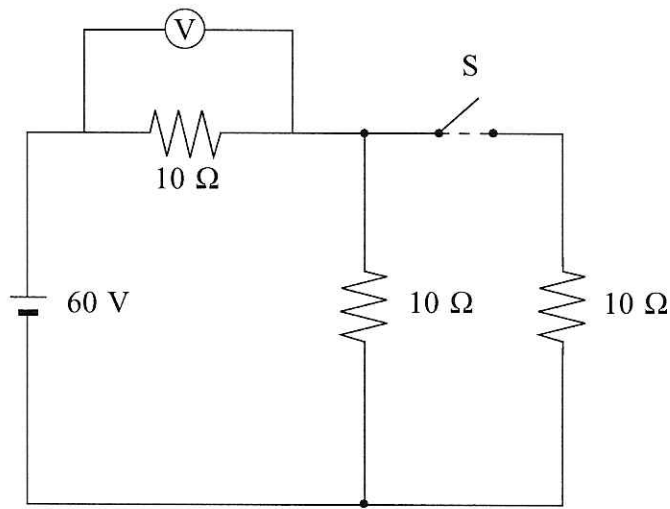
Which of the following is correct?

	VOLTMETER READINGS	
	SWITCH CLOSED	SWITCH OPEN
A.	20 V	30 V
B.	30 V	30 V
C.	40 V	20 V
D.	40 V	30 V

31. Which of the following arrangements would draw the smallest current when connected to a potential difference? All resistors have the same value.
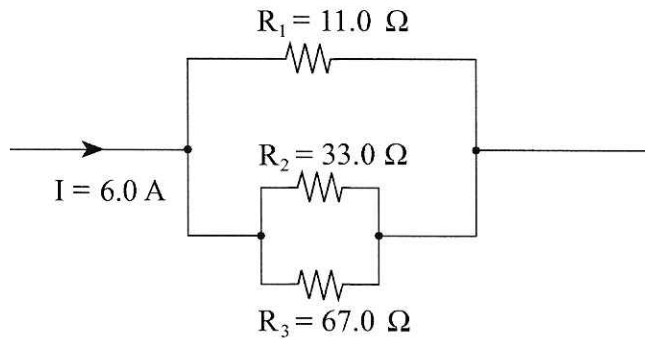
A.

B.

C.

D.
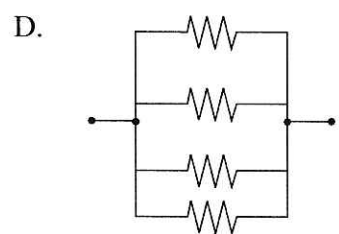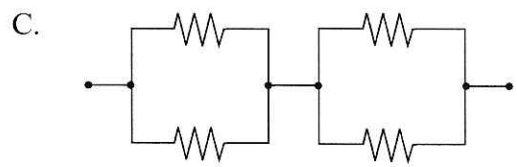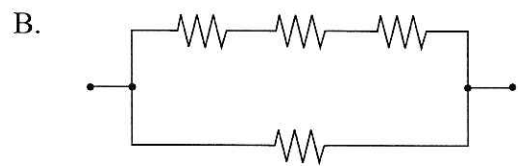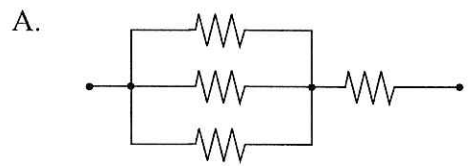
32. What is the power dissipated in resistor R_1 in the circuit shown in the diagram below?
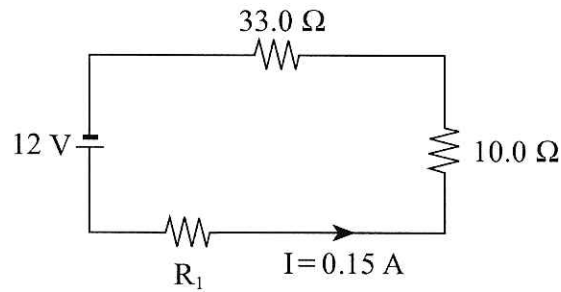
A. 0.83 W
B. 0.97 W
C. 1.8 W
D. 2.8 W
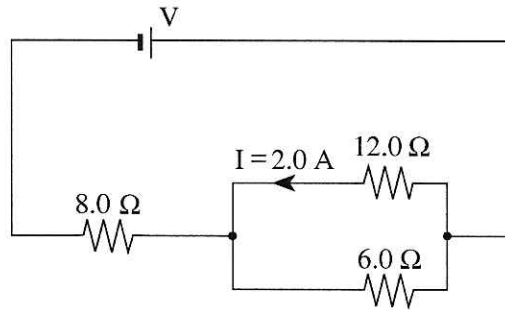
33. The diagram below shows part of an electrical circuit.
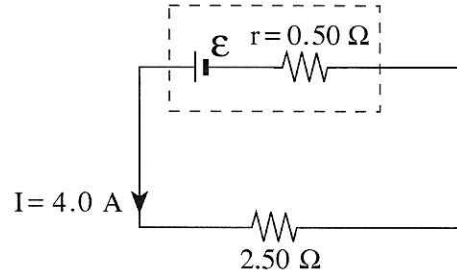

What is the current through resistor R_1?

A. 2.0 A
B. 3.0 A
C. 4.0 A
D. 6.0 A

34. A 75 W bulb is connected across a 120 V source. While the bulb is lighted, what is the effective resistance of the bulb?

A. 0.62 Ω
B. 1.6 Ω
C. 47 Ω
D. 190 Ω

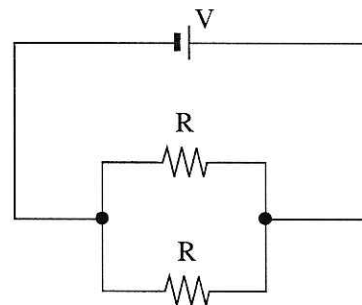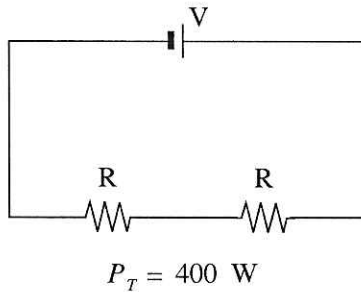35. What is the voltage, V, of the power supply shown in the circuit?

- A. 24 V
- B. 52 V
- C. 72 V
- D. 96 V

36. What is the emf of the battery shown?

- A. 2.0 V
- B. 8.0 V
- C. 10 V
- D. 12 V

37. Two identical resistors connected in series have a **total** power output of 400 W. Assuming V and R remain constant, what would the total power output be when the resistors are re-connected in parallel?
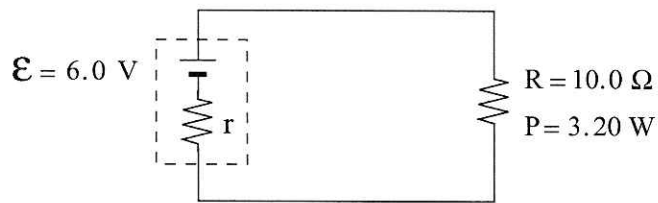

| A. 200 W | B. 400 W | C. 800 W | D. 1600 W |

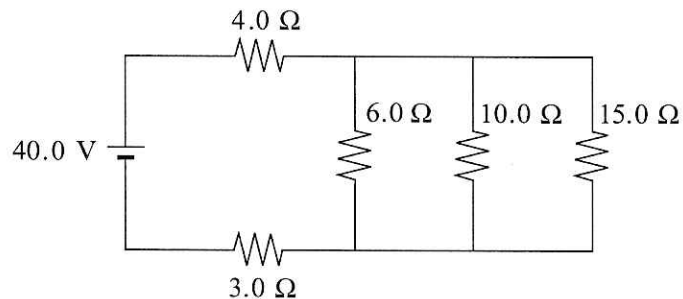38. In the following circuit, determine the value of resistor R.

A. 3.2 Ω
B. 5.2 Ω
C. 9.0 Ω
D. 23 Ω
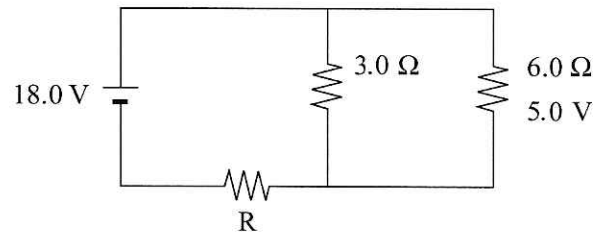
39. A battery provides 3.20 W of power to an external resistance. What power is dissipated as heat by the internal resistance within the battery?

A. 0.19 W
B. 3.4 W
C. 3.6 W
D. 60 W

40. Calculate the current through the 6.0 Ω resistor in the circuit shown.

A. 1.1 A
B. 2.0 A
C. 4.0 A
D. 6.7 A

1. a) Find the current in the 8.0 Ω   bulb shown below. **(5 marks)**

V = 30 V

$R_1 = 18 \ \Omega$

$R_2 = 9.0 \ \Omega$ $R_4 = 8.0 \ \Omega$

$R_3 = 3.0 \ \Omega$
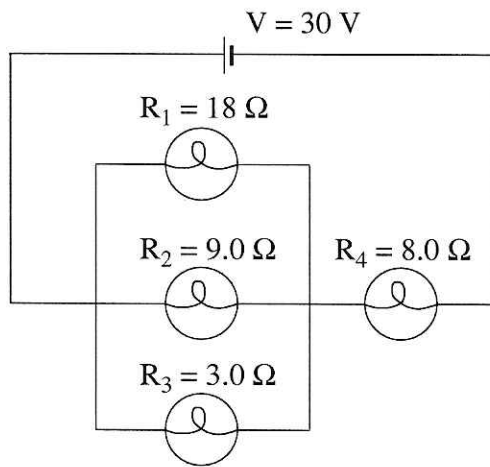
b) (i) The 3.0 Ω bulb is removed from the circuit so that only 3 bulbs remain.
The 8.0 Ω bulb will now: **(Circle one)**   **(1 mark)**

    A. be dimmer.
    B. be brighter.
    C. remain the same.

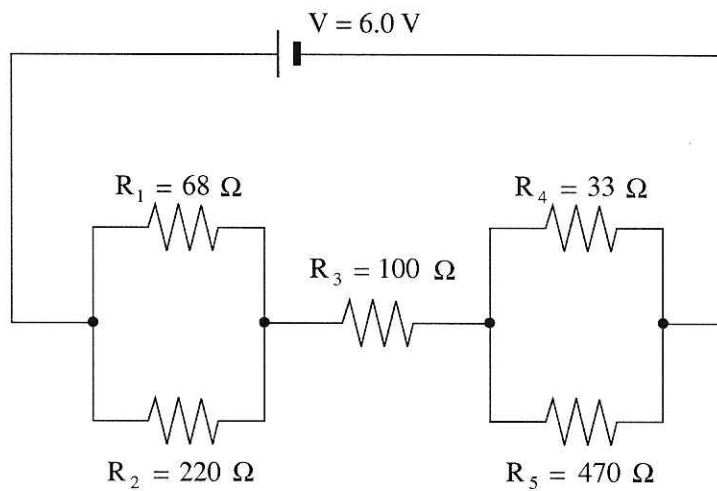(ii) Using principles of electrical circuits, explain your answer to b(i).   **(4 marks)**

_____

_____

_____

_____

_____

_____

2. Consider the circuit shown in the diagram below.

V = 6.0 V

R$_1$ = 68 Ω

R$_4$ = 33 Ω

R$_3$ = 100 Ω

R$_2$ = 220 Ω

R$_5$ = 470 Ω

a) What is the total resistance of the circuit?   **(3 marks)**

b) What is the current through the 100 Ω resistor? **(2 marks)**

c) What is the power dissipated in the 100 Ω resistor? **(2 marks)**