

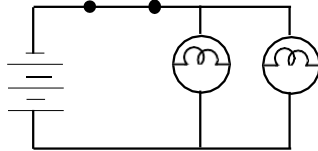
PART A: MULTIPLE CHOICE (25 MARKS)

Choose the best response in each case and place your answer in the appropriate space on your answer sheet.

ELECTRICAL CIRCUITS

1. What type of circuit is shown to the right?

(a) series
 (b) parallel
 (c) both



2. Voltage is a measure of:

(a) the resistance to the movement of charge.
 (b) the difference in electric potential between two points in a circuit.
 (c) the rate at which electric charge flows.

3. The unit of electric resistance is the:

(a) ampere (A)
 (b) volt (V)
 (c) ohm (Ω)

4. A voltmeter is used to measure the voltage in a circuit. How is it connected?

(a) in series
 (b) in parallel
 (c) it doesn't matter

5. A current of 0.080 A passing through a human body could be fatal. If you accidentally touched a 120 V supply, what skin resistance will produce a current of 0.080 A?

(a) 0.00067 Ω
 (b) 9.6 Ω
 (c) 1500 Ω

6. According to the "electron-flow" convention, when electric current flows in a conductor:

(a) protons move & electrons stay still.
 (b) electrons move & protons stay still.
 (c) protons & electrons move & neutrons stay still.

7. An ammeter is used to measure the current in a circuit. How is it connected?

(a) in series
 (b) in parallel
 (c) it doesn't matter

8. A circuit in which an electrical load cannot be disconnected without affecting other loads is known as a(n):

(a) parallel circuit.
 (b) short circuit.
 (c) series circuit.

9. The unit of current is the:

(a) ampere (A)
 (b) volt (V)
 (c) ohm (Ω)

CAPTURING ELECTRICAL ENERGY

10. Which method below uses uranium as a fuel to generate electrical energy?

(a) fossil fuel
 (b) hydroelectric
 (c) nuclear

11. Which method below uses falling water to generate electrical energy?

(a) fossil fuel
 (b) hydroelectric
 (c) nuclear

12. Which method below uses coal, oil, or natural gas as a fuel to generate electrical energy?

(a) fossil fuel
 (b) hydroelectric
 (c) nuclear

13. How much energy is being wasted if a 100 W device is left on for 20 hours?

(a) 2000 kW·h
 (b) 200 kW·h
 (c) 2.0 kW·h

14. What form of energy from coal is used to generate the electricity in a coal burning generating station?

(a) nuclear energy
 (b) chemical energy
 (c) mechanical energy

15. Choose from the descriptions below the one which would consume the most electric energy.

(a) A 60 W bulb left on for 80 h.
 (b) A TV rated at 220 W used for 5 h.
 (c) A stove rated at 8 kW is used for 3 h.

16. What form of energy from the fuel is used to generate the electrical energy at the Pickering Generating Station?
 (a) nuclear energy
 (b) chemical energy
 (c) mechanical energy
17. Which action involves transforming chemical energy into thermal energy?
 (a) using a toaster
 (b) having a campfire
 (c) beating a drum
18. What three things do you need in order to generate electricity using a generator?
 (a) wind, steam, the Sun
 (b) motion, wire coil, magnet
 (c) wire coil, a turbine, wind
19. What are kilowatt hours (kW·h) used to describe?
 (a) energy use
 (b) energy costs
 (c) type of energy
20. Which of the following is a fossil fuel?
 (a) carbon dioxide
 (b) coal
 (c) uranium
21. Which of the following statements describes a renewable energy source?
 (a) It always increases greenhouse gases.
 (b) It can be replaced by natural processes.
 (c) It will eventually be used up.
22. Choose from the descriptions below the one which would consume the least electric energy.
 (a) A TV rated at 220 W used for 5 h.
 (b) A stove of 8 kW used for 3 h.
 (c) A 60 W bulb left on for 80 h.
23. Which safety device needs to be replaced each time it stops excess current?
 (a) fuse
 (b) circuit breaker
 (c) switch
24. A battery converts chemical energy into which of the following?
 (a) sound energy
 (b) light energy
 (c) electrical energy
25. What is the cost of using a refrigerator continuously for one day if it is rated at 1000 W and the cost of electricity is \$0.06/kW·h?
 (a) 0.144¢
 (b) 1.44¢
 (c) \$1.44

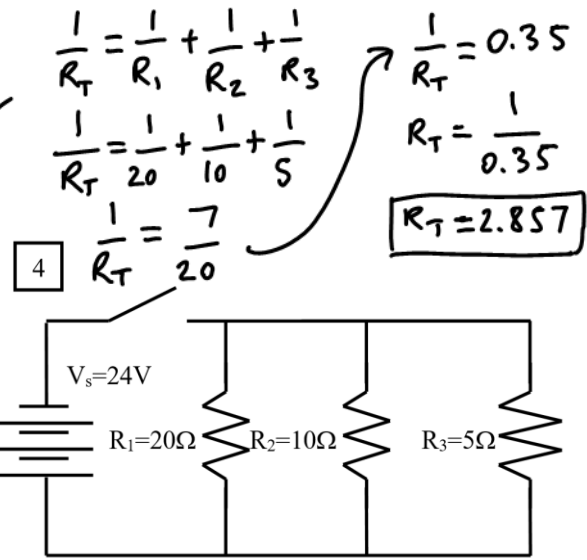
USING ELECTRICAL ENERGY

PART B: SHORT ANSWER

1. Identify the type of circuit and find the missing values.

Type of circuit: Parallel
 Equations:

$V_S = 24V$ $I_T = 8.4A$ $R_T = 2.857\Omega$
 $V_1 = 24V$ $I_1 = 1.2A$ $R_1 = 20\Omega$
 $V_2 = 24V$ $I_2 = 2.4A$ $R_2 = 10\Omega$
 $V_3 = 24V$ $I_3 = 4.8A$ $R_3 = 5\Omega$
 SAME



2. A lightbulb is connected to a 240v outlet, and produces 0.1kW of light and heat. What is the resistance of the wire in the lightbulb?

$V = 240v$
 $P = 0.1kW \times \frac{1000W}{1kW}$
 $P = 100W$
 $P = I \cdot V$
 $I = \frac{P}{V} = \frac{100W}{240v}$
 $I = 0.417A$
 $V = I \cdot R$
 $R = \frac{V}{I} = \frac{240v}{0.417A}$
 $R = 576\Omega$