2.2 Electrical Power Past Paper Questions

1. Appliances convert electrical energy into other forms of energy.

State the **useful** energy output from the following appliances.

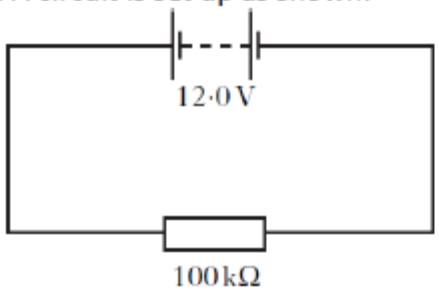
(i) Lamp: electrical energy ..... energy (1)

(ii) Kettle: electrical energy ..... energy (1)

(iii) Hair dryer: electrical energy ..... energy (1)

(iv) Food processor: electrical energy ..... energy (1)

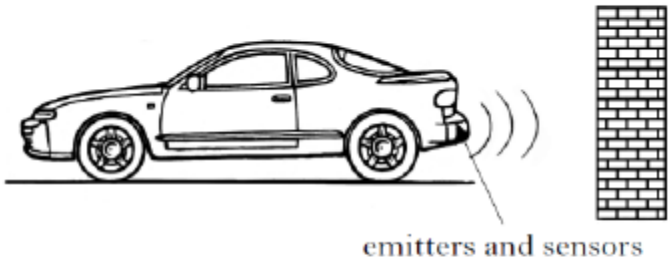
2. A circuit is set up as shown.



The power supplied to the resistor is

A. 1.20×10^{-4} W
B. 1.44×10^{-3} W
C. 1.44 W
D. 694 W
E. 1.20×10^{6} W. (1)

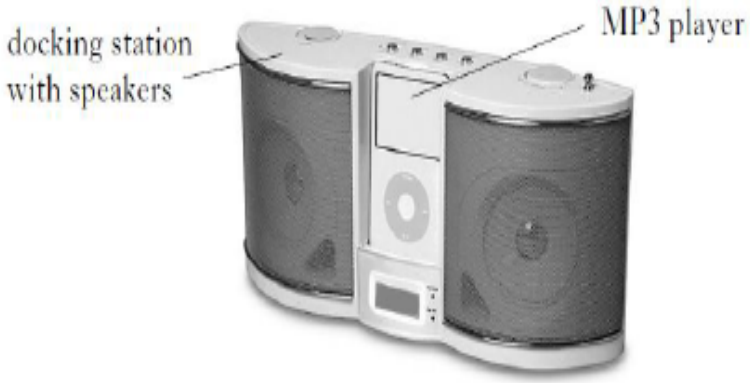
3. Parking sensors are fitted to the rear bumper of some cars. A buzzer emits audible beeps, which become more frequent as the car moves closer to an object.



Ultrasonic pulses are emitted from the rear of the car. Objects behind the car reflect the pulses, which are detected by sensors. Ultrasonic pulses travel at the speed of sound.

The sensor operates at a voltage of 12 V and has a current range of 20–200 mA. Calculate the maximum power rating of the sensor. (3)

4. The MP3 player put on a docking station with external speakers.



Calculate the voltage across a 10 W speaker if its resistance is 8 ohms. (3)

5. Calculate the power in a 1kΩ resistor carrying 50mA. (3)

6. Calculate the resistor of a resistor when a power rating of 500W requires a current of 0.05A. (3)

7. Calculate the current used in appliance rated at 3kW has a resistance of 0.5 Ω. (3)

8. The rating plate on an electrical appliance is shown.

230 V~
50 Hz
920 W
model: HD 1055

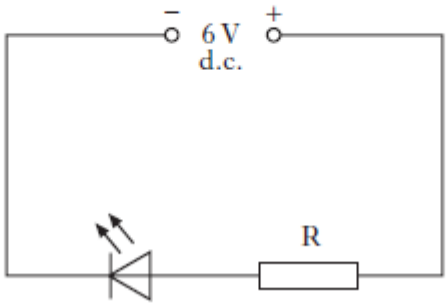
The resistance of this appliance is

A 0·017 Ω
B 0·25 Ω
C 4·0 Ω
D 18·4 Ω
E 57·5 Ω.

(1)

9 Light emitting diodes (LEDs) are often used as on/off indicators on televisions and computers.

An LED is connected in a circuit with a resistor R.

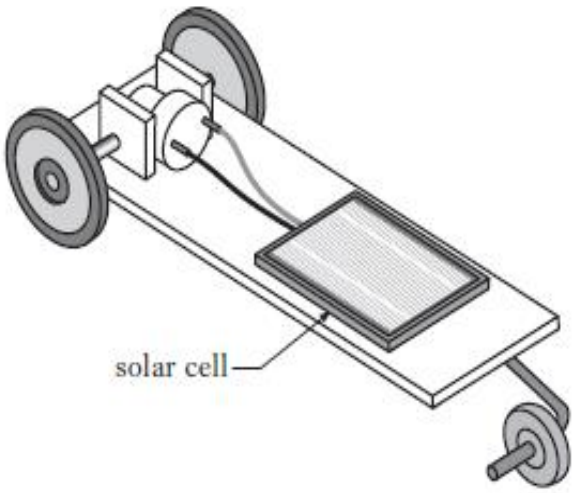


a) The LED is rated at 2V, 100mA.

Calculate the resistance of resistor R. (3)

b) Calculate the power developed by resistor R when the LED is working normally. (3)

10 A solar cell is tested for use in a buggy.



The solar cell produces a voltage of 0·5 V and a current of 0·4 mA.

(*a*) (i) Calculate the power produced by the solar cell. **3**

(ii) The buggy requires 4 mW to operate. Calculate the number of solar cells required to supply this power. **3**

(*b*) State the energy change in a solar cell. **1**

11. A kettle rated at 2kW is left to bring water to the boil for 2 mins. Calculate the energy transformed in that time. (3)

12. Find 5 appliances in your household and state the power rating of each. Construct a table showing your results and state what energy changes are involved with each appliance. (3)

Total Marks 40