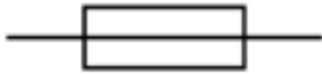


Q1.(2018)

a)



b)

$$E = 13 \times 230$$

$$E = 2990 \text{ (J)}$$

Q2.(2019)

a)

The energy transferred each second to the bulb.

b)

power = potential difference $\times$
current

or

$$P = VI$$

c)

$$40 = I \times 230$$

$$I = \frac{40}{230}$$

$$I = 0.17 \text{ (A)}$$

d)

$$\text{efficiency} = \frac{\text{useful power output}}{\text{total power input}}$$

e)

$$0.30 = \frac{\text{useful power output}}{9.0}$$

$$\text{useful power output} = 0.30 \times 9.0$$

$$\text{useful power output} = 2.7 \text{ (W)}$$

f)

bulbs also transfer thermal energy

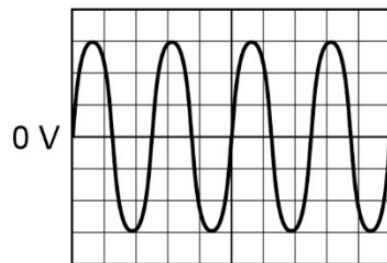
the efficiency of the light bulb also needs to be considered

Q3.(2020)

a)

50 Hz

b)



c)

$$P = 0.020 \times 230$$

$$P = 4.6 \text{ (W)}$$

d)

$$E = 180 \times 230$$

$$E = 41\,400 \text{ (J)}$$

e)

Hazard:

live wire

or

high potential difference

Risk:

electric shock

or

electrocution

Q4.(2022)

a)

$$P = V \times I$$

b)

$$4.4 = 40 \times I$$

$$I = \frac{4.4}{40}$$

$$I = 0.11 \text{ (A)}$$

c)

$$\text{efficiency} = \frac{\text{useful power output}}{\text{total power input}}$$

d)

$$0.85 = \frac{P}{4.0}$$

$$P = 0.85 \times 4.0$$

$$P = 3.4 \text{ (W)}$$

Q5.(2024)

a)

50 hertz

b)

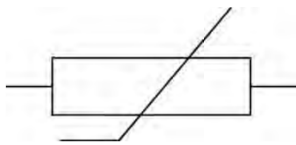
230 volts

c)

$$\text{resistance} = \frac{0.45}{0.75}$$

$$\text{resistance} = 0.60 \text{ } (\Omega)$$

d)



e)

pd across battery - pd across
thermistor

f)

1.5 V

(thermistor has the) same
resistance as resistor

or

both (components) have a
resistance of 200 (Ω)

g)

resistance at 15 °C = 200 (Ω)

change in resistance = 400 (Ω)

Q6.(2024)

a)

brown

b)

blue

c)



d)

$$\text{current} = \frac{2.0}{0.40}$$

$$\text{current} = 5.0 \text{ (A)}$$

e)

$$m = 0.000016 \text{ (kg)}$$

or

$$m = 1.6 \times 10^{-5} \text{ (kg)}$$

$$E = 0.000016 \times 60\,000$$

$$E = 0.96 \text{ (J)}$$

f)

the total energy will be greater