

## Homework

14 (a)  $P = 50W$

$V = 220V$

$$\therefore 50 = \frac{220 \times 220}{R}$$

$$\Rightarrow R_1 = \frac{220 \times 220}{50} = 968 \Omega$$

$P = 100W$

$V = 220V$

$$\therefore R_2 = \frac{220 \times 220}{100} = 484 \Omega$$

$\therefore R_1 > R_2$

$P = I^2 R$

$P_1 = I^2 R_1$

$\& P_2 = I^2 R_2$

[I = constant]

$\therefore P_1 > P_2$

$\therefore$  Bulb of 50W will glow brighter

(b)  ~~$P = 100W$~~

$V = \text{constant}$

$\therefore P = V^2/R$

$\therefore$  100W will glow brighter

$P = V^2/R$

$P = 100W$

$V = 120$

$$\therefore 100 = \frac{120 \times 120}{R}$$

$$\Rightarrow R = \frac{120 \times 120}{100} = 144 \Omega$$

37  $V = 250V$ ,  $P = 1500W$ ,  
 $P = VI$

(i)  $\therefore I = \frac{1500}{250} = 6A$

(ii) Energy consumed =  $VI \times t$   
 $= \frac{250 \times 6 \times 5 \times 60 \times 60}{1000}$   
 $= \frac{25 \times 30}{10} = 75 \text{ kWh}$

(iii) 1 kWh costs ₹ 2.2

∴ 75 kWh ~~costs~~ will cost

$$= 2.2 \times 75 = \frac{22}{10} \times 75 = \frac{22 \times 15}{2} = ₹ 165$$