

Name of the Student: \_\_\_\_\_

Max. Marks : 21 Marks

Time : 21 Minutes

Mark Schemes

**Q1.**

(a) the polarity (of the supply) does not change  
*allow potential difference in one direction (only)* 1

(b) energy transferred = power × time 1

(c) 162 000 000 = 7200 × t 1

$$t = \frac{162\,000\,000}{7200} \quad \text{1}$$

$$t = 22\,500 \text{ (s)} \quad \text{1}$$

(d)  $V = I \times R$  1

(e) 480 = 15 × R 1

$$R = \frac{480}{15} \quad \text{1}$$

$$R = 32 \text{ (}\Omega\text{)} \quad \text{1}$$

(f) time taken using system **A** is double the time of system **B** 1

**[10]****Q2.**

(a) density =  $\frac{\text{mass}}{\text{volume}}$   
 or

$$\rho = \frac{m}{V} \quad \text{1}$$

- (b)  $998 = \frac{m}{6\,500\,000}$  1
- $m = 998 \times 6\,500\,000$  1
- $m = 6\,487\,000\,000$  1
- $m = 6.487 \times 10^9$  (kg)  
*allow a correct conversion of their calculated value of mass into standard form* 1
- (c) energy transferred = power  $\times$  time  
**or**  
 $E = Pt$  1
- (d)  $t = 18\,000$  (s)  
**or**  
 $t = 5 \times 60 \times 60$  1
- $E = 1.5 \times 10^9 \times 18\,000$   
*allow a correct substitution using an incorrectly/not converted value of  $t$*  1
- $E = 2.7 \times 10^{13}$  (J)  
*allow a correct calculation using an incorrectly/not converted value of  $t$*  1
- (e) the variation in demand is (much) greater than  $1.5 \times 10^9$  W  
*allow the increase in demand is greater than the (power) output of the (hydroelectric) power station* 1
- demand remains high for longer than 5 hours  
*allow 04:00 to 16:00 is 12 hours*  
*allow 04:00 to 16:00 is greater than 5 hours* 1

[11]