

P2 Energy Work & Power CORE Questions – ANSWER KEY

P2.1

- (a) force / weight ;
 (vertical) distance ; [2]
- (b) (density =) $\frac{\text{mass}}{\text{volume}}$;
 $= \frac{4000}{3.9} = 1026 \text{ (kg/m}^3\text{)} ;$ [2]
- (c) (i) (10 Hz – no mark)
 lowest frequency detected is 20 Hz ; [1]
- (ii) number of waves produced / passing a point per second ; [1]
- (iii) sound wave – arrow in same direction as wave movement ;
 water wave – arrow perpendicular to wave movement ; [2]

[Total: 8]

P2.2

Question	Answer	Marks
4(a)	chemical gravitational potential energy OR kinetic	B2
4(b)	hovering OR stationary OR moving slowly at max height	B1 B1
4(c)	thermal dissipated to the air / surroundings	B2

P2.3

Question	Answer	Marks
3(a)	manometer	B1
3(b)	760–280	C1
	480 (mm Hg)	A1
3(c)	(level A) up (level B) down	B1

P2.4

(a) 70 (kg) ;
mass does not depend on/change with gravitational field strength ; [2]

(b) (KE =) $\frac{1}{2} mv^2$;
 $= \frac{1}{2} \times 1\,500\,000 \times 2\,500 \times 2\,500 = 4.7 \times 10^{12}$ (J) ;
 $= 4.7 \times 10^9$ (kJ) ; [3]

(c) (i) sound waves cannot travel through space/vacuum **or** sound waves need a medium ; [1]

(ii) ((speed =) $\frac{\text{distance}}{\text{time}} =) \frac{2.25 \times 10^{11}}{750}$ **or** $2.25 \times 10^8 \times \frac{1000}{750}$
 $= (3 \times 10^8 \text{ m/s}) ;$ [1]

(iii) 3×10^8 (m/s) ; [1]

[Total: 8]

P2.5

- (a) lines drawn from electric drill to kinetic energy; radio to sound energy; torch to light energy; [3]
- (b) ray refracted at both surfaces; evidence of dispersion; [2]
- (c) (angle of) reflection; 60°; [2]

P2.6

Question	Answer	Marks
3(a)	fan to kinetic ; kettle to thermal ; torch to light ;	3
3(b)	symbols correct ; two cells, lamp and switch all in series ;	2
3(c)	$r = V / I$ or $3.0 / 0.6$; 5 (Ω) ;	2
3(d)(i)	reflection ;	1
3(d)(ii)	angle of incidence (<i>i</i>) correctly labelled ;	1
3(e)(i)	wind / waves / HEP / geothermal / tides ;	1
3(e)(ii)	oil / coal / natural gas / peat ;	1

P2.7

12(a)(i)	(the generator), it is has greatest weight ;	1
12(a)(ii)	moment = force \times perpendicular distance from pivot or $40 \times 100\,000$; 4 000 000 (Nm) ;	2
12(a)(iii)	no resultant turning effect ;	1
12(b)(i)	kinetic ; electrical ;	2
12(b)(ii)	advantage: wind is a renewable energy source ; disadvantage: if no wind means no energy produced ;	2
12(c)(i)	increases ;	1
12(c)(ii)	20 Hz to 20 000 Hz ;	1

P2.8

Question	Answer	Marks
3(a)	manometer	B1
3(b)	760–280	C1
	480 (mm Hg)	A1
3(c)	(level A) up (level B) down	B1

P2.9

3(a)	Kinetic OR movement energy from wind OR moving air	B1
	<u>turns</u> turbine	B1
	turbine turns generator (to generate electricity)	B1
3(b)	Any two advantages from: reliable supply of electricity large amount of electrical energy produced / power output plentiful supply of fuel	B2
	Any two disadvantages from: non-renewable (energy source) greenhouse gases / carbon dioxide produced / increases global warming contributes to atmospheric / air pollution / acid rain	B2

P.10

Same as P2.7. I stuffed up!