9	(a)	(i)	normal force acting on an unit area	1
		(ii)		

	Diagram 6.1	Diagram 6.2	
Surface area	Large	Small	1
Force applied	Large	Small	1
Ease of cutting	Difficult	Easy	1

	• The larger the surface area, the larger the force required to cut the potato	1
	• The larger the surface area, the smaller the pressure	1
(b)	• Gas flows into the coiled tube and tries to straighten it	1
	• The slight movement of the coiled tube is amplified by the lever system	1
	• The lever system moves a pointer which points to a scale	1
	• When the gas supply is cut off, the coiled tube returns to its original position	1
(c)	• Wide tyres should be used to increase the surface area so that the pressure on the sand can be reduced	1+1
	• Large diameter tyres should be used to lift vehicle off the ground so that it will not hit any uneven bumps	1+1
	• Large tread patterns / lengthwise tread along the tyres should be used to increase grip on sand	1+1
	• 4-wheel-drive should be used to increase torque on each wheel to move them	1+1
	• Light buggy should be used to reduce the pressure on the sand so that it won't sink in	1+1
10 (a)	Induced across the wire when a wire moves and cuts the magnetic field lines / flux	1
(b)	• Speed of the motion of the insulated conductor in Diagram 10.2 is higher than in Diagram 10.1	1
	• Deflection of the galvanometer in Diagram 10.2 is more than in Diagram 10.1	1
	• When the speed of motion of insulated conductor increases, the rate of cutting magnetic flux increases	1
	• When the speed of motion of insulated conductor increases, the induced current increases	1
	• When the rate of cutting magnetic flux increases, the induced current increases (Faraday's law)	1
(c)	• Rotate the coil in clockwise direction	1
	• The coil cut across the magnetic filed	1
	• Current is induced in the coil	1
	• The commutater change the direction in the coil so that the direction of current in external circuit always the same	1
(d)	• Use thin diaphragm : easy to vibrate	1+1
	• Use strong material for diaphragm : not easy to break	1+1
	• Higher number of turns of coil : increase the rate of change of magnetic flux / increases magnitude of the induced current	1+1
	• Thicker diameter of wire of oil : reduce the resistance of the coil	1+1
	• Use more powerful magnet : increases the strength of the magnetic filed / increase the rate of change of magnetic flux / increases magnitude of the induced current	1+1

11	(a)	(i)	Measurement of the degree of hotness of an object	1
		(ii)	• Thermometer is placed in the mouth of patient	1
			• Heat is transferred from patient's body to the thermometer	1
			• Thermal equilibrium between the thermometer and patient's body is reached when the net rate of heat transfer is zero	1
			• The thermometer and the patient's body are at the same temperature. The thermometer reading shows the temperature of the patient's body	1
	(b)		• Low specific heat capacity of ice cream box : easy get cold / become cool quickly	1+1
			• Smaller size of ice cream box : easy to carry // easy to become cool	1+1
			• Plastic PVC : poor conductor of heat	1+1
			• Bright colour of outer box : does not absorb heat from the surrounding	1+1
			• R is chosen	
			• Because low specific heat capacity and smaller size of ice cream box, made of platic PVC and bright colour of outer box	1 1
	(c)	(i)	$L = \frac{Pt}{m} = \frac{0.1 \times 1000 \times 156}{0.05}$	1
			$= 312\,000\ \text{J kg}^{-1}$	1
		(ii)	$c = \frac{Pt}{m\theta} = \frac{0.1 \times 1000 \times 72}{0.05 \times 140}$	1+1
			$= 1028.57\ \text{J kg}^{-1}\ ^{\circ}\text{C}^{-1}$	1

12	(a)		The work done in moving one coulomb of charge from one point to another point	1
	(b)	(i)	• V increases when I increases	1
			• resistance, $R = \frac{V}{I}$ = gradient of the graph	1
			• gradient increases when current increases, resistance increases as temperature increases	1
		(ii)	energy dissipated decreases when the current is decreased.	1
	(c)		• material of the filament made up of tungsten wire : higher resistance per unit length and higher melting point compared with copper wire	1+1
			• Thin filament : greater resistance, as $R \propto \frac{1}{A}$, A = cross-sectional area	1+1
			• Coiled filament : long wire can be fitted into the glass bulb, concentrating heat and producing brighter light	1+1
			• nitrogen gas at low pressure : filament will not melt easily	1+1
			• filament lamp A is the most suitable	1
			• because uses thin and coiled tungsten wire and contains nitrogen gas at low pressure in the bulb	1
	(d)	(i)	P = VI	
			11 = 120 I	1
			I = 0.09 A	1
		(ii)	11 – 10	1
			= 1 J	1
		(iii)	$\frac{10}{11} \times 100\% = 90.91\ \%$	1