Question number	Answer	Notes	Marks
10 (a) i	substitution; rearrangement; evaluation; e.g. $80 \times 1.01 \times 10^5 = 10 \times p_2$ $p_2 = \frac{80 \times 1.01 \times 10^5}{10}$ $= 8.08 \times 10^5$ (Pa)	equation is given accept 8 or 8.1 $\times 10^5$ (Pa) 808 000 (Pa) POT error loses 1 mark allow 2 marks max for using V_2 as 70 (115 400)	3
ii	the temperature is constant;		1
iii	any two from: MP1. friction /rubbing; MP2. between rubber disc and walls OR air molecules and valve; MP3. work is done on the gas;	 allow for 1 mark unqualified statement that temperature increases pressure as increases	2
b i	work done = force X distance moved;		1
ii	conversion of mass to N; substitution; evaluation; e.g. 1.25 kg is 12.5N F= 12.5 × 8.70 =109 (J)	 allow GPE calculation accept 108.75 (J) 110 (J) 10.875 or 11 J gets 1 mark maximum	3

		other POT error only loses conversion mark	

Total 10 marks

Question number	Answer	Notes	Marks
13 (a)	any two from: same starting temperature; same volume of water; same time interval;		2
b i	B; because dark surfaces are good emitters;		2
ii	C; it has the greatest surface area (exposed to the air);	allow widest opening/eq	2
c	MP1. It loses the least amount of (thermal) energy; MP2. cotton wool reduces conduction; MP3. the white/light surface (of the cotton wool) is a poor emitter (of radiation); MP4. the lid reduces convection;	MP2, 3, 4 must include a method of thermal energy transfer allow lid reduces evaporation for MP4 allow cotton wool is an insulator for MP2	4

Total 10 marks