

# New test - June 13, 2018 [23 marks]

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1. [1 mark]

**Markscheme**

B

2. [1 mark]

**Markscheme**

C

3. [1 mark]

**Markscheme**

B

4. [1 mark]

**Markscheme**

B

5. [1 mark]

**Markscheme**

B

6. [1 mark]

**Markscheme**

A

7. [1 mark]

**Markscheme**

B

8. [1 mark]

**Markscheme**

D

9. [1 mark]  
**Markscheme**  
D

10a. [2 marks]  
**Markscheme**  
defined from the equation of state of an ideal gas  $PV=nRT$ ;  
all symbols ( $PVnT$ ) correctly identified;

10b. [1 mark]  
**Markscheme**  
390/391 K;

10c. [2 marks]  
**Markscheme**  
work done =  $(P\Delta V = 2.32 \times 10^5 \times 2.20 \times 10^{-3} =) 510\text{J}$ ;  
thermal energy =  $(760 + 510 =) 1.27 \times 10^3\text{J}$ ;  
*Award [1 max] if volume is taken as  $3.6 \times 10^{-3}$ , giving an answer of 1600 J.*

10d. [2 marks]  
**Markscheme**  
an adiabatic change is one in which no (thermal/heat) energy is transferred between system and surroundings / no energy enters/leaves system;  
a rapid compression means that there is insufficient time (for energy transfer) / *OWTTE*;

11. [1 mark]  
**Markscheme**  
B

12. [1 mark]  
**Markscheme**  
C

13. [1 mark]  
**Markscheme**  
B

14. [1 mark]

**Markscheme**

B

15. [1 mark]

**Markscheme**

D

16. [1 mark]

**Markscheme**

B

17. [1 mark]

**Markscheme**

B