

## Higher Physics Prelim Revision – Unit 1 Answers

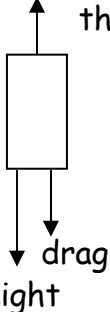
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|-------|-------|-------|
| 1. C  | 2. A  | 3. C  |
| 4. A  | 5. E  | 6. D  |
| 7. C  | 8. C  | 9. A  |
| 10. C | 11. D | 12. C |
| 13. B | 14. C |       |

15. (a) i)  $V_H = 3.5 \text{ ms}^{-1}$       ii)  $V_V = 6.1 \text{ ms}^{-1}$   
 (b)  $t = 0.8 \text{ s}$   
 (c)  $s = 1.74 \text{ m}$   
 (d)  $E_K$  is less when enters dish.

This is because most  $E_K$  transferred to  $E_P$  as dish at greater height.

16. (a) i)  $s = 98 \text{ m}$   
 ii)  $v = 39.6 \text{ ms}^{-1}$  and  $v = 28 \text{ ms}^{-1}$  (1<sup>st</sup> test)       $\Delta v = 39.6 - 28 = 11.6 \text{ ms}^{-1}$   
 iii)  $s = 320 \text{ m}$

17. (a)  $F = 4.53 \times 10^6 \text{ ms}^{-2}$  on a bearing of  $100^\circ$   
 (b)  $a = 0.45 \text{ ms}^{-2}$   
 (c) As the speed increases the drag increases.  
 Drag and pulling force become balanced.

18. (a) i)       ii)  $F_{\text{unb}} = \text{thrust} - \text{weight} = 660 \times 10^3 \text{ N}$   
 $a = 2.2 \text{ ms}^{-2}$

- ii) Fuel is used up so mass of rocket decreases.

19. (a)  $v = -0.3 \text{ ms}^{-1}$   
 (b) i) space probe  
 ii)  $t = 1.6 \text{ s}$   
 (c) fire rocket engine then fire probe engine for twice as long.

20. (a) 120 kPa  
 (b)  $E_K$  of molecules increases ( $\frac{1}{2}$ ). Molecules collide with container walls more often ( $\frac{1}{2}$ ).  
 Collisions with container are of greater force ( $\frac{1}{2}$ ). Pressure of gas increases ( $\frac{1}{2}$ ).

- (c) i) 0.7 N      ii) 35 mm  
 21. (a)  $P = \text{atmos pressure} + \rho gh = 111,290 \text{ Pa}$   
 (b) upthrust = 1176 N  
 (c) upthrust is greater because sea water has greater density than fresh water.