



Video Solution on Website:-

<https://physicsaholics.com/home/courseDetails/58>

Video Solution on YouTube:-

<https://youtu.be/3ofSaZDargY>

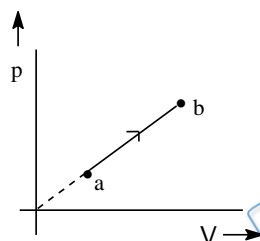
- Q 1. The gas molecules are not accumulated at the bottom of the container because -  
(a) These do not have gravitation force between them  
(b) Molecules have less mass and high velocities and therefore gravitational force is not effective  
(c) The direction of motion of molecules is changing on account of collisions.  
(d) There is cohesive force between the gas molecules and the wall of the container acting in all direction.
- Q 2. Which of the following statement is not according to the postulates of kinetic theory of gases.-  
(a) Gas molecules are of small size  
(b) Gas molecules are always in motion with all possible velocities  
(c) There is no force between the molecules  
(d) None of these
- Q 3. A container of volume 30 litre is filled with an ideal gas at one atmosphere pressure and  $0^\circ\text{C}$  temperature. Keeping the temperature constant some mass of gas is allowed to escape from the container. Due to this the pressure of the gas decreases to 0.78 atmos from the previous one. If the density of the gas at N.T.P. is 1.3 gm/litre, the mass of the gas remaining is  
(a) 30.4 gm (b) 25.5 gm  
(c) 18.3 gm (d) 12.7 gm
- Q 4. A container is filled with 7 gram nitrogen and 11 gram  $\text{CO}_2$  at 290 K. If the pressure of the mixture is 1 atmos, then the density of mixture is -  
(a)  $1.25\text{ kg/m}^3$  (b)  $1.35\text{ kg/m}^3$   
(c)  $1.50\text{ kg/m}^3$  (d)  $1.75\text{ kg/m}^3$
- Q 5. A closed and big compartment containing gas is moving with some acceleration in horizontal direction, neglect effect of gravity. Then the pressure in the compartment is  
(a) Same everywhere  
(b) Lower in the front side  
(c) Lower in the rear side  
(d) Lower in the upper side
- Q 6. At the top of mountain, a thermometer reads 280 K and a barometer reads 70 cm of Hg. At the bottom of mountain, they read 300 K and 76 cm of Hg. Find the ratio of densities of air at the top and that at the bottom  
Z(a) 0.80  
(b) 0.89  
(c) 0.99



(d) 0.79

Q 7. A cylindrical vessel of height 500 mm has an orifice (small hole) at its bottom. The orifice is initially closed and water is filled in it up to height  $H$ . Now the top is completely sealed with a cap and the orifice at the bottom is opened. Some water comes out from the orifice and the water level in the vessel become steady with height of water column being 200 mm. Find the fall in height (in mm) of water level due to opening of the orifice [take atmospheric pressure =  $1.0 \times 10^5 \text{ N/m}^2$ , density of water =  $1000 \text{ kg/m}^3$  and  $g = 10 \text{ m/s}^2$ . Neglect any effect of surface tension].

Q 8. In the P-V diagram shown in the figure, as one moves from a to b, match the following :



**Column - I**

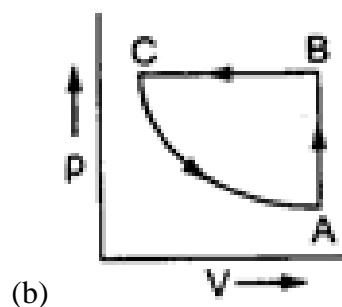
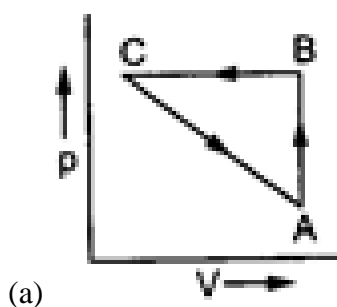
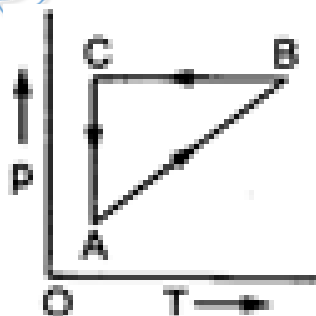
- a) Temperature
- b) Density
- c) V - T graph
- d) P - T graph

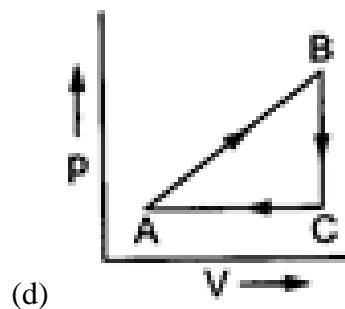
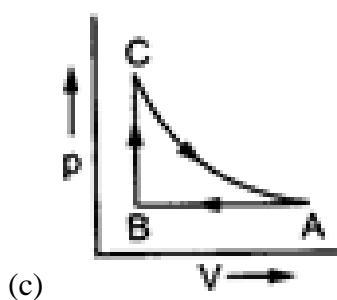
**Column - II**

- p) Increasing
- q) Decreasing
- r) Straight Line
- s) Parabola
- t) Hyperbola

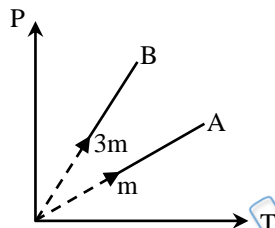
Q 9. A vessel contains 1 mole of  $\text{O}_2$  gas (molar mass 32) at a temperature  $T$ . The pressure of the gas is  $P$ . An identical vessel containing one mole of He gas (molar mass 4) at a temperature  $2T$  has a pressure of  $x(P)$  where  $x =$

Q 10. A cyclic process is shown on the p-T diagram. Which of the curves show the same process on a p-V diagram?

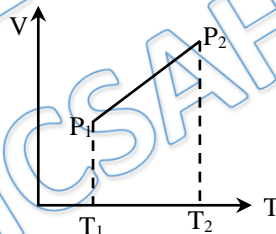




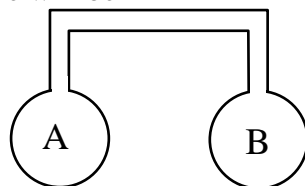
- Q 11. Two different masses  $m$  and  $3m$  of an ideal gas are heated separately in a vessel of constant volume, the pressure  $P$  and absolute temperature  $T$ , graphs for these two cases are shown in the figure as A and B. The ratio of slopes of curves B to A is –



- (a) 3 : 1  
(b) 1 : 3  
(c) 9 : 1  
(d) 1 : 9
- Q 12. From the following V-T diagram we can conclude



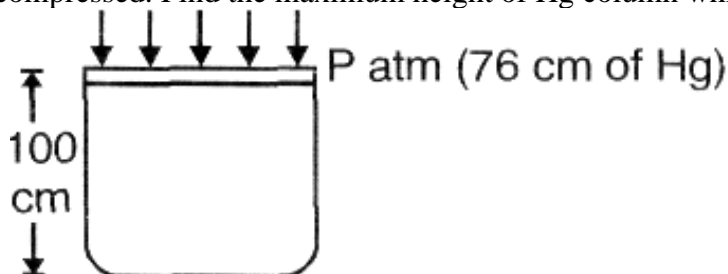
- (a)  $P_1 = P_2$   
(b)  $P_1 > P_2$   
(c)  $P_1 < P_2$   
(d) None of these
- Q 13. Two spherical vessels of equal volumes are connected by a narrow tube. The apparatus contain an ideal gas at one atmosphere and 300K. Now if one vessel is immersed in a bath of constant temperature 600 K and the other in a bath of constant temperature 300 K then the common pressure will be –



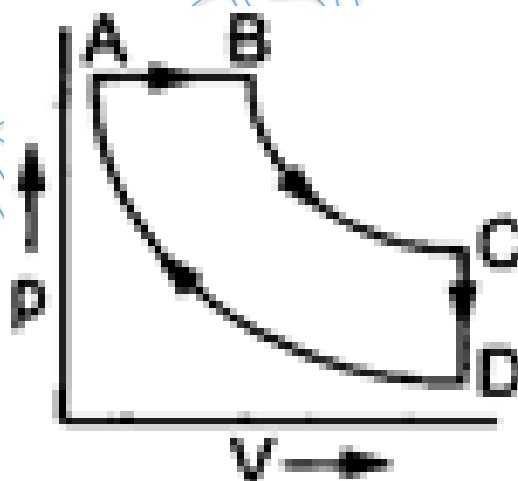
- (a) 1 atm  
(b) 4/5 atm  
(c) 4/3 atm

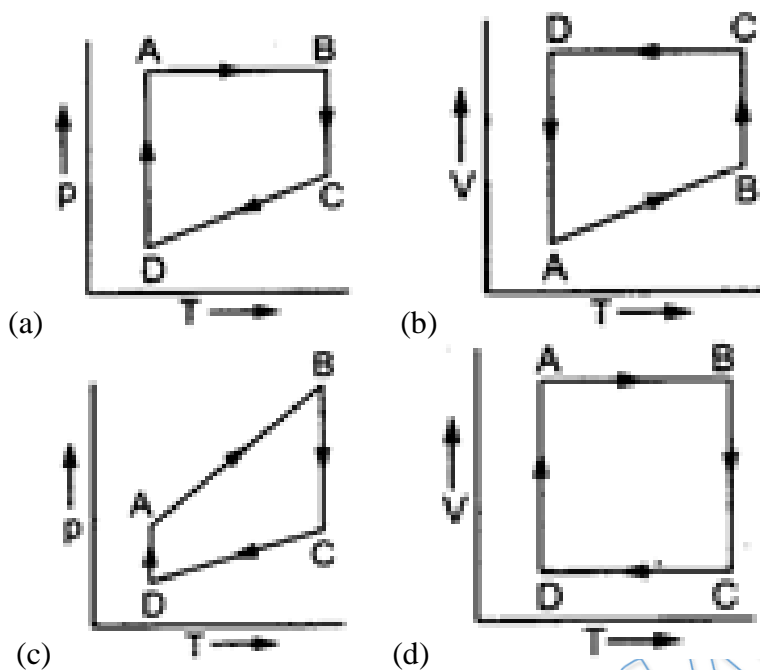
(d)  $3/4$  atm

- Q 14. A vertical cylinder of height 100 cm contains air at room temperature and its top is closed by a frictionless massless piston at atmospheric pressure (76 cm of mercury column). If mercury is slowly poured on the piston, due to extra weight air is compressed. Find the maximum height of Hg column which can be put on the piston



- (a) 76  
(b) 24  
(c) 8  
(d) 12
- Q 15. A 20 cm long test tube (cylindrical) is inverted and pushed vertically down into water. When the closed end is at water surface, how high has the water risen inside the tube?  
(a) 0.38 cm  
(b) 10 cm  
(c) 20 cm  
(d) 15 cm
- Q 16. A cyclic process ABCD is shown in the p-V diagram. Which of the following curves represent the same process? BC and AD has constant temperature





## Answer Key

Q.1 b	Q.2 d	Q.3 a	Q.4 c	Q.5 b
Q.6 c	Q.7 6	Q.8 a(p), b(q), c(s), d(s)	Q.9 2	Q.10 b
Q.11 a	Q.12 c	Q.13 c	Q.14 b	Q.15 a
Q.16 a,b				