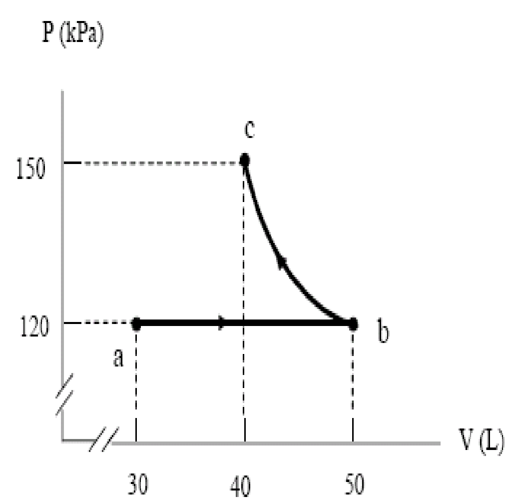
**Q#1.** A sample of an ideal gas is compressed by a piston from 10 $m^3$ to 5 $m^3$ and simultaneously cooled from 540 K to 270 K. As a result there is: (Ans: No change in pressure).

**Q2.** One mole of an ideal gas is cooled at constant pressure process from 100 $^oC$ to 40 $^oC$. Calculate the work done during the process. (Ans: –500 J)

**Q3.** 6 moles of an ideal gas are kept at a constant temperature of 60 .0 $^oC$ while the pressure of the gas is increased from 1.00 atm to 4.00 atm. Find the heat involved during this process. (Ans: -23 kJ)

**Q#4** Five moles of an ideal gas are kept at a constant temperature of 53.0 degrees Celsius while the pressure of the gas is increased from 1.00 atm to 3.00 atm. Find the work done in the process. ( **A1 14.9 kJ of work done on the gas**.)

**Q#5.** An ideal gas expands at constant pressure of 120 kPa from (a) to (b) as shown in the Figure 1. It is then compressed isothermally to point (c) where the volume is is 40 L. Find the net work done during these two processes ( Ans: 1060 J )



Q6. The mass of an oxygen molecule is 16 times that of a hydrogen molecule. At room temperature, the ratio of the rms speed of an oxygen molecule to that of a hydrogen molecule is: (Ans: ¼)

**Q#7.** A sample of argon gas ( $M_{Ar}$ = 40 g/mole) is at four times the absolute temperature of hydrogen gas ($M_H$ = 2 g/mole). The ratio of the rms speed of the argon atoms to that of hydrogen molecules is: (Ans: 0.45 )

**Q8** Two moles of nitrogen are in a 3-liter container at a pressure of 5.0*10**6 Pa. Find the average translational kinetic energy of a molecule. **A1: 1.9*10**(-20) J.**

**Q9** Two identical containers, one has 2.0 moles of type 1 molecules, of mass m1, at 20 degrees Celsius. The other has 2.0 moles of type 2 molecules, of mass m2 = 2*m1, at 20 degrees Celsius. The ratio between the average translational kinetic energy of type 2 to that of type 1 is: **A1: . 8)**