### Question 355
0.44-54%
The air in an automobile engine at 20 degree-C is compressed adiabatically from an initial pressure of 1 atm and a volume of 200 cm**3 to a final volume of 20 cm**3. Find the final temperature if the air behaves like an ideal gas. [Take gamma = 1.4]
(a)    50  degree-C
(b)    20  degree-C
(c)    10  degree-C
(d)    463 degree-C
(e)    526 degree-C

### Question 356
0.66-42%
Two moles of a gas, originally at atmospheric pressure, occupy a volume of 0.0500 m**3. The gas is compressed adiabatically to half its original volume. What is the final temperature of the gas? Use Cp/Cv = 1.4.
(a)    128 K
(b)    573 K
(c)    295 K
(d)    401 K
(e)    300 K

### Question 357
0.52-30%
One mole of a monatomic ideal gas is initially at a temperature of 300 K and with a volume of 0.030 m**3. The gas is compressed adiabatically to a volume of 0.040 m**3. What is the final temperature?
(a)    100 K.
(b)    7.00 K.
(c)    522 K.
(d)    476 K.
(e)    999 K.

| 20 | All Sections |
|----|--------------|

### Question 358
0.44-31%
A gas is taken through the cyclic process shown in Figure 1. Calculate the net thermal energy transferred to the gas during two cycles.



Figure 1
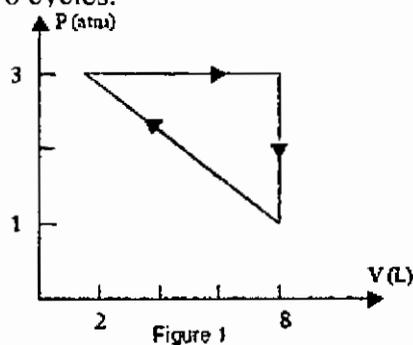
(a)    909  J
(b)    zero
(c)    101  J
(d)    1212 J
(e)    2424 J

20

## Question 359
5 moles of hydrogen gas occupy a balloon that is inflated to a volume of 0.3 m**3 and at 1.0 atmospheric pressure. What is the root-mean square velocity of the molecules inside the balloon? [The mass of hydrogen atom is 1.66*10**(-27) kg].
(a)     3.0*10**9 m/s.
(b)     3.4*10**2 m/s.
(c)     4.3*10**3 m/s.
(d)     2.2*10**3 m/s.
(e)     1.3*10**3 m/s.

20

## Question 360
For an ideal gas, which of the following statements is FALSE:
(a)     In an isothermal process, there is no change in the internal energy.
(b)     In an adiabatic process, no heat enters or leaves the system.
(c)     In an isothermal process, the work done is equal to heat energy.
(d)     In a constant volume process, the work done by the gas is zero.
(e)     In any cyclic process, the work done by the gas is zero.

20

## Question 361
Helium gas is heated at constant pressure from 32 degrees Fahrenheit to 212 degrees Fahrenheit. If the gas does 20.0 Joules of work during the process, what is the number of moles?
(a)     0.050 moles.
(b)     0.013 moles.
(c)     0.200 moles.
(d)     0.024 moles.
(e)     0.111 moles.

20

## Question 362
For an ideal gas, Which of the following statements are CORRECT: 1. Cp  Cv = R/2. 2. In an isothermal process, the internal energy of the system does not change. 3. In an adiabatic process, no heat enters or leaves the system. 4. In a constant volume process, the work done by the system is positive.
(a)     2 and 4.
(b)     2 and 3.
(c)     3 and 4.
(d)     1, 2 and 4.
(e)     1 and 3.

20
0 50-72%

## Question 363
The temperature of an ideal gas remains constant as its volume is decreased. Which one of the following statements is CORRECT?
(a)     The pressure of the gas decreases in the process.
(b)     The gas does positive work on its surroundings.
(c)     The average kinetic energy of the gas molecules increases.
(d)     Heat flows out of the gas into the surroundings.
(e)     The process is adiabatic.