



# DELHI PUBLIC SCHOOL FIROZABAD

(UNDER THE AEGIS OF DELHI PUBLIC SCHOOL SOCIETY EAST OF KAILASH NEWDELHI)

(A SENIOR SECONDARY SCHOOL)

AFFILIATED TO CBSE, AFFILIATION NO. 2133064 SCHOOL NO: 61225



Class – 11<sup>th</sup>

Name: \_\_\_\_\_

Roll no: \_\_\_\_\_

Subject - **Physics**

Topic: Thermodynamics

Worksheet Dated: 18.01.22

1. Two identical samples of gas are expanded so that the volume is increased to twice the initial volume. However, sample number 1 is expanded isothermally while sample number 2 is expanded adiabatically. In which sample is the pressure greater? Why?
2. A gas is suddenly compressed to  $\frac{1}{3}$  of its original volume. Calculate the rise in temperature, the original temperature being 300 K and  $\gamma = 1.5$ .
3. A perfect engine utilizes an ideal gas. The source temperature is 500 K and the sink temperature is 375 K. If the engine takes 600 Kcal per cycle from the source, compute:
  - a. The efficiency of the engine
  - b. Work done per cycle
  - c. Heat rejected to the sink per cycle.
4. A refrigerator has, to transfer an average of 263 J of heat per second from temperature – 10°C to 25°C. Calculate the average power consumed assuming ideal reversible cycle and no other losses.
5. What is the coefficient of performance ( $\beta$ ) of a Carnot refrigerator working between 30°C and 0°C?
6. A certain volume of dry air at NTP is allowed to expand 4 times its original volume under
  - a. isothermal conditions
  - b. adiabatic conditions.
  - c. Calculate the final pressure and temperature in each case  $\gamma = 1.4$ .
7. In a refrigerator, heat from inside at 277 K is transferred to a room at 300 K. How many joules of heat will be delivered to the room for each joule of electric energy consumed ideally?

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