

## WEEK-01 of 08

**Due date: July 08, 2023**

Dear All

It is time for a little study so that you can remember the topics until final exam. This review will make you skill and give you the clarity. Please print and send me through WhatsApp on time.

I will check and reply to you.

**Follow the due date please! You will get the next HW after completion.**

### SUMMER BREAK WEEKLY CHALLENGE

THINGS TO DO THIS SUMMER BREAK: -

Task: Look through the formula and solve all the relevant problems  
Make sure to include all the relevant units.



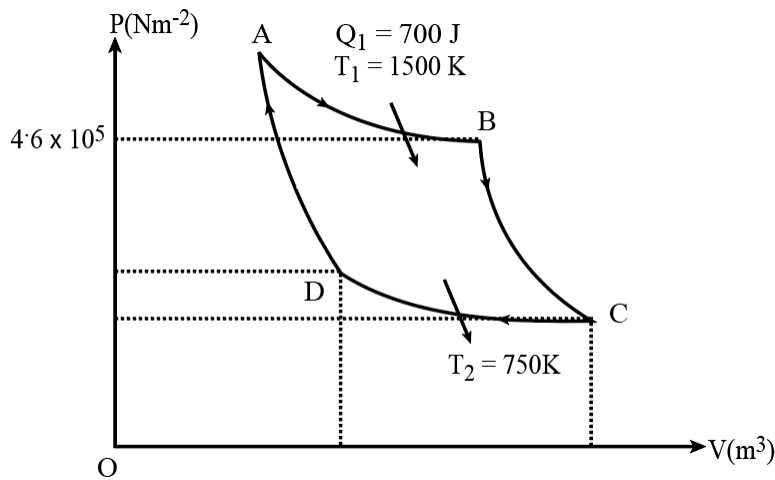
$$\frac{Q_1}{T_1} = \frac{Q_2}{T_2}$$

$$W = Q_1 - Q_2$$

$$\text{Co-efficient of performance, } K = \frac{Q_2}{W} = \frac{Q_2}{Q_1 - Q_2}$$

**PROBLEM: 01**

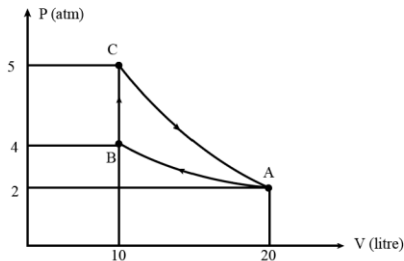
Four steps of working substance in a Carnot's Engine are shown in the figure given below—



(c) Calculate the heat lost in the sink refer to above figure. 3



## PROBLEM: 02



In the figure, a cycle is shown with the graph P–V.

Here, the temperature at A = 360K.

c. By applying Charles's law, find the temperature at 'C'.



## PROBLEM: 03

An engine takes 1250 J of heat from source at 500K and rejects 625J of heat to the sink. By changing heat energy both of the source and the sink its efficiency can be increased through 20%.

(c) Find the temperature of the sink. 3



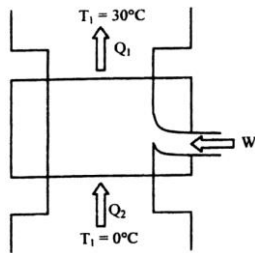
## PROBLEM: 04

An engine absorbs 521 J heat from source at temperature 321<sup>0</sup>C and rejects some amount of heat to the sink at 21<sup>0</sup>C temperature.

c. Determine the amount of work done by the engine in the stem.

## PROBLEM: 05

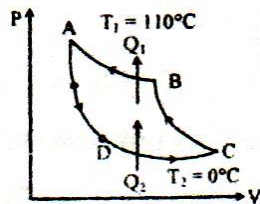
A refrigerator performs minimum work done by removing  $Q_2$  heat at  $0^\circ\text{C}$  temperature 1 gm of water converted into ice and  $Q_1$  heat rejected into environment. Later the refrigerator is exchanged with a heat engine which works opposite of the refrigerator.



c. Calculate the coefficient of performance of the refrigerator.

## PROBLEM: 06

P-V diagram of an engine is shown in the figure:



c. Determine work done by the engine of the stem.

