

# Chapter 11 :-

$$* W = P \Delta V$$

$$* P \Rightarrow P_a$$

$$* V \Rightarrow M^3$$

\* W is (+) when work done by system.

$$U = \frac{3}{2} N k_B T$$

( $\frac{3}{2} N k_B T \Rightarrow U$ )

$$* k_B = \frac{R}{N_A}$$

\* N  $\Rightarrow$  عدد الجزيئات

$$\rightarrow \Delta U = Q - W$$

\* Q (+), if heat is added to system.

\* area under curve = W



# Chapter 12 :-

$$\textcircled{1} \Delta L = \alpha L \cdot \Delta T$$

$$\textcircled{2} \Delta A = (2\alpha) A \cdot \Delta T$$

$$\textcircled{3} \Delta V = (3\alpha) V \cdot \Delta T \quad * 3\alpha = \beta$$

$$\textcircled{4} C = \left( \frac{DQ}{DT} \right) \left( \frac{1}{n} \right)$$

$$\textcircled{5} C_V = \left( \frac{1}{n} \right) \left( \frac{DU}{DT} \right) = \frac{3}{2} R$$

$$\textcircled{6} C_P = C_V + R = \frac{5}{2} R$$

$$\textcircled{7} S = \frac{C}{M} \quad * M \text{ is mass of (1) mole in (kg)}$$

\* S  $\Rightarrow$  specific heat

$$\textcircled{8} Q = M S \Delta T$$

$$\textcircled{9} DQ = M_s S DT + M_s S_c DT \quad * M \text{ in kg}$$

$$\textcircled{10} DQ = L M \quad * L \Rightarrow \text{latent heat}$$

\* M  $\Rightarrow$  mass in kg

Heat convection

$$H = q A \Delta T$$

Heat conduction

$$H = \frac{k A \Delta T}{L}, \quad H = \frac{A \Delta T}{R}, \quad R = \frac{L}{k}$$

\* k  $\Rightarrow$  thermal conduction

\* L  $\Rightarrow$  المسافة

\* A  $\Rightarrow$  مساحة السطح

Radiation :-

$$H = e \sigma A T^4 \quad * T \text{ in Kelvin}$$

$$H_{net} = H_{out} - H_{in} = e \sigma A (T_o^4 - T_i^4)$$

\* خطوات كل سؤال السبع :-

1) احس كمية الطاقة اللازمة لذابة كل السبع

$$DQ = L m_{ice} \quad m \text{ in kg}$$

2) احس كمية الطاقة التي لديها عند الانتقال من

درجة الحرارة المنخفضة بالسؤال (مثلاً من 0  $\rightarrow$  40)

$$DQ = M S \Delta T$$

3) اذا كان (ك) < (ل) يذوب السبع وطلب منك حساب درجة الحرارة النهائية

$$(1) + m_{ice} S \Delta T = M_{water} S \Delta T$$

4) اذا كان (ك) اقل من (ل) يذوب السبع ودرجة الحرارة النهائية صفر

الطلب منك حساب كمية السبع التي ذابت :-

$$\text{melted ice} = \frac{\text{energy we have}}{\text{for 1kg}} = \frac{(2)}{333}$$

$$\text{net melt} = m_{ice} - \text{melted}$$



## CHAPTER 30 NUCLEAR PHYSICS

imum energy required according to classical physics.

### EXERCISES

#### Section 30.2 | Half-Life

30-1 After 24 hours the radioactivity of a nuclide is one-eighth times its original level. What is its half-life?

30-2 How many half-lives are required for the activity of a radionuclide to decrease by a factor of 64?

30-3 Using the data in Table 30.1, find the effective half-life for  $^{35}\text{S}$ .

30-4 A radionuclide with a physical half-life of 10 days is observed to have an effective half-life of 6 days when administered to a patient. What is the biological half-life of the nuclide?

30-5 Estimate the half-life of the radioactive substance whose count rate is given in Table 30.2 by inspection of the table.

1) 8

2)  $6^2$

3)  $\frac{1}{T} = \frac{1}{87.1} + \frac{1}{22} \Rightarrow T = 17.96$

4)  $\frac{1}{6} = \frac{1}{10} + \frac{1}{T} \Rightarrow T = 15$

5)