Date Planned : __ / __ / __	Daily Tutorial Sheet-1	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	JEE Main (Archive)	Exact Duration :_____

1. For endothermic reaction, where ΔH represents the enthalpy of the reaction in kJ/mol, the minimum value of the energy of activation will be: **(1992)**

(A) less than ΔH **(B)** zero **(C)** more than ΔH **(D)** equal to ΔH

2. Identify the intensive quantities from the following. **(1993)**

(A) enthalpy **(B)** temperature **(C)** volume **(D)** refractive index

3. The following is/are endothermic reaction(s) **(1999)**

(A) Combustion of methane

(B) Decomposition of water

(C) Dehydrogenation of ethane to ethylene

(D) Conversion of graphite to diamond

4. In thermodynamics, a process is called reversible when : **(2001)**

(A) surroundings and system change into each other

(B) there is no boundary between system and surroundings

(C) the surroundings are always in equilibrium with the system

(D) the system changes into the surrounding spontaneously

5. Which one of the following statement is false? **(2001)**

(A) Work is a state function

(B) Temperature is a state function

(C) Change in the state is completely defined when the initial and final states are specified

(D) Work appears at the boundary of the system

6. Two moles of an ideal gas is expanded isothermally and reversibly from 1 litre to 10 litre at 300 K. The enthalpy change (in kJ) for the process is : **(2001)**

(A) 11.4 kJ **(B)** –11.4 kJ **(C)** 0 kJ **(D)** 4.8 kJ

7. Which of the following statements is/are false ? **(2001)**

(A) Work is state function

(B) Temperature is a state function

(C) Change in the state is completely defined when the initial and final states are specified

(D) Work appears at the boundary of the system

8. Among the following the intensive property is (properties are) : **(2010)**

(A) molar conductivity **(B)** electromotive force

(C) resistance **(D)** heat capacity

9. A piston filled with 0.04 mole of an ideal gas expands reversibly from 50.0 mL to 375 mL at a constant temperature of 37°C. As it does so, it absorbs 208 J of heat. The values of q and W for the process will be: (R = 8.314 J/mol K, ln 7.5 = 2.01) **(2013)**

(A) q = +208J, W = –208J **(B)** q = –208J, W = –208J

(C) q = –208J, W = +208J **(D)** q = +208J, W = +208J

10. The following reaction is performed at 298K **(2015)**

$$2NO(g) + O_2(g) \rightleftharpoons 2NO_2(g)$$

The standard free energy of formation of NO(g) is 86.6 kJ/mol 298 K. What is the standard free energy of formation of $NO_2(g)$ at 298K? $K_p = 1.6 \times 10^{12}$

(A) $R(298)\ln\left(1.6 \times 10^{12}\right) - 86600$ **(B)** $866000 + R(298)\ln\left(1.6 \times 10^{12}\right)$

(C) $86600 - \dfrac{\ln\left(1.6 \times 10^{12}\right)}{R(298)}$ **(D)** $0.5\left[2 \times 86600 - R(298)\ln\left(1.6 \times 10^{12}\right)\right]$

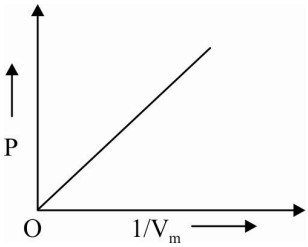
11. ΔU is equal to: **(2017)**

(A) Isothermal work **(B)** Isochoric work

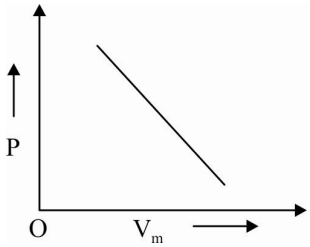
(C) Isobaric work **(D)** Adiabatic work

12. The combination of plots which does not represent isothermal expansion of an ideal gas is : **(2019)**

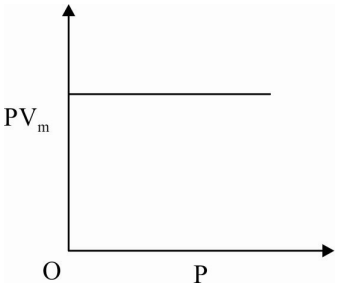
(A)



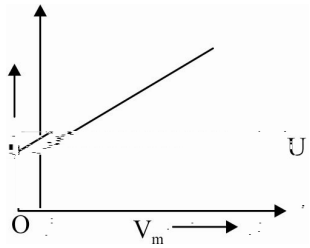
(B)



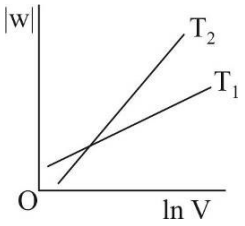
(C)



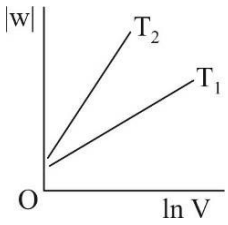
(D)



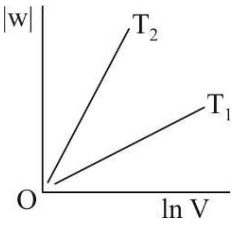
13. Consider the reversible isothermal expansion of an ideal gas in a closed system at two different temperatures T_1 and $T_2 (T_1 < T_2)$. The correct graphical depiction of the dependence of work done (w) on the final volume (V) is : **(2019)**



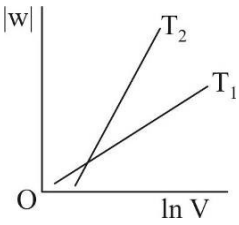
(A)



(B)



(C)



(D)

14. The entropy change associated with the conversion of 1 kg of ice at 273 K to water vapour at 383 K is : (Specific heat of water liquid and water vapour are $4.2\ \text{kJ K}^{-1}\text{kg}^{-1}$ and $2.0\ \text{kJ K}^{-1}\text{kg}^{-1}$; heat of liquid fusion and vapourisation of water are $334\ \text{kJ kg}^{-1}$ and $2491\ \text{kJ kg}^{-1}$, respectively). **(2019)**

(log 273 = 2.436, log 373 = 2.572, log 383 = 2.583)

(A) $9.26\ \text{kJ kg}^{-1}\text{K}^{-1}$ **(B)** $2.64\ \text{kJ kg}^{-1}\text{K}^{-1}$

(C) $7.90\ \text{kJ kg}^{-1}\text{K}^{-1}$ **(D)** $8.49\ \text{kJ kg}^{-1}\text{K}^{-1}$

15. An ideal gas undergoes isothermal compression from $5\,\text{m}^3$ to $1\,\text{m}^3$ against a constant external pressure of $4\,\text{Nm}^{-2}$. Heat released in this process is used to increase the temperature of 1 mole of Al. If molar heat capacity of Al is $24\,\text{J mol}^{-1}\text{K}^{-1}$, the temperature of Al increases by : **(2019)**

(A) $\frac{3}{2}\text{K}$ **(B)** 2K **(C)** 1K **(D)** $\frac{2}{3}\text{K}$