

MGMs JUNIOR COLLEGE

WORKSHEET

Subject - Chemistry

Total Questions - 30

Roll No.					

XII

15-Apr-2015

00:00 To 00:00

This is to certify that, the entry of Roll No. has been correctly written and verified.

JEE/CET

Candidate's Signature

Invigilator's Signature

Note :

- i) All Questions are compulsory
- ii) Darken (●) the appropriate circle(○) of the most correct option/response with black ball point pen.

Chemical Thermodynamics + Chemical Kinetics

- 1) Internal energy of an ideal gas depends on
- A) Volume B) Temperature
- C) Pressure D) None of these
- 2) Any series of operations so carried out that at the end, the system is back to its initial state is called
- A) Boyles cycle B) Reversible process
- C) Adiabatic process D) Cyclic process
- 3) One calorie is equal to [CPMT 1988]
- A) 0.4184 Joule B) 4.184 Joule
- C) 41.84 Joule D) 418.4 Joule
- 4) The total internal energy change for a reversible isothermal cycles is
- A) Always 100 calories per degree
- B) Always negative
- C) 0
- D) Always positiv
- 5) A well stoppered thermos flask contains some ice cubes. This is an example of a [AIIMS 1992]
- A) Closed system B) Open system
- C) Isolated system D) Non-thermodynamic system
- 6) If ω is the amount of work done by the system and q is the amount of heat supplied to the system. Identify the type of the system [AMU (Med.) 2010]
- A) Isolated system
- B) Closed system
- C) Open system
- D) System with thermally conducting walls
- 7) Which of the following units represents the largest amount of energy [CPMT 1989; MP PET 2000; AMU 2001]
- A) Electron volt B) Erg
- C) Joule D) Calorie
- 8) Energy equivalent to one erg, one joule and one calorie is in the order [CPMT 1997]
- A) 1 erg > 1 joule > 1 calorie
- B) 1 erg > 1 calorie > 1 joule
- C) 1 calorie > 1 joule > 1 erg
- D) 1 joule > 1 calorie > 1 erg
- 9) Heat produced in calories by the combustion of one gram of carbon is called
- A) Heat of combustion of carbon
- B) Heat of formation of carbon
- C) Calorific value of carbon
- D) Heat of production of carbon
- 10) Conditions of standard state used in thermochemistry is
- A) 0° C and 1 atm B) 20° C and 1 atm
- C) 25° C and 1 atm D) OK and 1 atm
- 11) The temperature of the system decreases in an [KCET

2005]

- A) Adiabatic compression B) Isothermal compression
C) Isothermal expansion D) Adiabatic expansion

12) Changes in a system from an initial state to the final state were made by a different manner that ΔH remains same but q changes because [J and K CET 2010]

- A) ΔH is a path function and q is a state function
B) ΔH is a state function and q is a path function
C) Both ΔH and q are state functions
D) Both ΔH and q are path functions

13) If a refrigerator's door is opened, then we get [CPMT 1980]

- A) Room heated
B) Room cooled
C) More amount of heat is passed out
D) No effect on room

14) The cooling in refrigerator is due to [KCET 2005]

- A) Reaction of the refrigerator gas
B) Expansion of ice
C) The expansion of the gas in the refrigerator
D) The work of the compressor

15) The half life period for a first order reaction is 69.3 s. Its rate constant is :

- A) 10^{-2} s^{-1} B) 10^{-4} s^{-1} C) 10 s^{-1} D) 10^2 s^{-1}

16) For a reaction $X \rightarrow Y$, the rate of the reaction has been found to be third order with respect to X . What happens when the concentration of X is doubled :

- A) rate becomes double B) rate becomes three times
C) rate becomes six times D) rate becomes eight times.

17) If half life period for a first order reaction is 2 min. The rate constant is :

- A) 0.5 min^{-1} B) 1.386 min^{-1}
C) 0.3465 min^{-1} D) 2 min^{-1}

18) Nitrogen tetroxide (N_2O_4) decomposes as : $\text{N}_2\text{O}_4(\text{g}) \rightarrow 2\text{NO}_2(\text{g})$ If the pressure of N_2O_4 falls from 0.50 atm to 0.32 atm in 30 minutes, the rate of appearance of $\text{NO}_2(\text{l})$ is

- A) $0.006 \text{ atm min}^{-1}$ B) $0.003 \text{ atm min}^{-1}$
C) $0.012 \text{ atm min}^{-1}$ D) $0.024 \text{ atm min}^{-1}$

19) Starting with one mole of a compound X , it is found that the reaction is $3/4$ complete in 1 min. What is the rate constant, if the reaction follows first order ?

- A) 0.213 sec^{-1} B) 2.31 sec^{-1}
C) 0.0231 sec^{-1} D) $2.31 \times 10^{-3} \text{ sec}^{-1}$

20) The rate of a first order reaction is $0.69 \times 10^{-2} \text{ min}^{-1}$ and the initial concentration is 0.5 mol L^{-1} . The half life period is :

- A) 3000 s B) 0.33 s C) 50 s D) 100 s

21) The rate of a first order reaction is $1.8 \times 10^{-3} \text{ mol L}^{-1} \text{ min}^{-1}$, when the initial concentration is 0.3 mol L^{-1} . The rate constant in the units of second is

- A) $1 \times 10^{-2} \text{ s}^{-1}$ B) $1 \times 10^{-4} \text{ s}^{-1}$
C) $6 \times 10^2 \text{ s}^{-1}$ D) $6 \times 10^2 \text{ s}^{-1}$

22) The rate constant for a first order reaction is $k = 7 \times 10^{-4} \text{ s}^{-1}$. The time taken for the reactant to be reduced to $1/4$ of the initial concentration is :

- A) 990 s B) 1980 s C) 445 s D) 29

23) The rate of a first order reaction has been found to be $2.45 \times 10^{-6} \text{ mol L}^{-1} \text{ s}^{-1}$ at concentration C_1 . The value of C_1 is (rate constant = 3.5×10^{-5}) :

- A) 7.0 mol L^{-1} B) 0.7 mol L^{-1}
C) 0.07 mol L^{-1} D) 2.1 mol L^{-1}

24) For the reaction : $2A + B + C \rightarrow A_2B + C$ the rate law has been found to be $\text{Rate} = k[A][B]^2$ with $k = 2.0 \times 10^{-6} \text{ mol}^{-1} \text{ L}^{-2} \text{ s}^{-1}$. The initial rate of reaction with $[A] = 0.1 \text{ mol L}^{-1}$, $[B] = 0.2 \text{ mol L}^{-1}$ and $[C] = 0.8 \text{ mol L}^{-1}$ is :

- A) $6.4 \times 10^{-8} \text{ mol L}^{-1} \text{ s}^{-1}$ B) $4 \times 10^{-3} \text{ mol L}^{-1} \text{ s}^{-1}$
C) $8.0 \times 10^{-9} \text{ mol L}^{-1} \text{ s}^{-1}$ D) $4.0 \times 10^{-7} \text{ mol L}^{-1} \text{ s}^{-1}$

25) An exothermic reaction $A \rightarrow B$ has an activation energy of 17 kJ per mole of A . The heat of reaction is 40 kJ. The activation energy for the reverse reaction $B \rightarrow A$ is :

- A) 23 kJ B) 97 kJ C) 57 kJ D) 17 kJ.

26) The rate of a first order reaction : $R \rightarrow P$ is $7.5 \times 10^{-4} \text{ mol L}^{-1} \text{ min}^{-1}$, when the concentration of R is 0.5 mol L^{-1} . The rate constant is :

- A) $2.5 \times 10^{-5} \text{ s}^{-1}$ B) $1.5 \times 10^{-3} \text{ s}^{-1}$
C) $4.16 \times 10^{-7} \text{ s}^{-1}$ D) $1.50 \times 10^{-5} \text{ s}^{-1}$

27) The decomposition of ozone proceeds as : $\text{O}_3 \rightleftharpoons \text{O}_2 + \text{O}$ (fast) $\text{O} + \text{O}_3 \rightarrow 2\text{O}_2$ (slow) The rate expression should be

- A) $\text{Rate} = k[\text{O}_3]^2$ B) $\text{Rate} = k[\text{O}_3]^2[\text{O}_2]^{-1}$
C) $\text{Rate} = k[\text{O}_3][\text{O}_2]$ D) $\text{Rate} = k[\text{O}_3][\text{O}_2]^{-1}$

28) The rate for a first order reaction is $0.693 \times 10^{-2} \text{ mol dm}^{-3} \text{ min}^{-1}$ and the initial concentration is 0.2 mol dm^{-3} . The half life period is :

- A) 1200 s B) 0.33 s C) 20 s D) 600 s

29) If 8.0 g of a radioactive isotope has a half life period of 10 hrs, the half life period of 2.0 g of the same substance is :

- A) 2.5 hrs B) 5.0 hrs C) 10 hrs D) 40 hrs.

30) In the reaction : $A + 2B \rightleftharpoons C + 2D$ 2.6×10^{-2} M sec⁻¹
What is the value of the initial rate - at $t = 0$ was found to be
at $t = 0$ in M sec⁻¹ ?

A) 2.6×10^{-2} .

B) 5.2×10^{-2}

C) 0.1

D) 6.5×10^{-3} .

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