



## CHEMISTRY

### BOOKS - UNITED BOOK HOUSE

### JODHPUR PARK BOYS SCHOOL QUESTION PAPER

#### Exercise

1. 10 g of hydrogen and 64 g of oxygen were filled in a steel vessel and exploded. Amount of water produced in this reaction will be

- A. 1mol
- B. 2 mol
- C. 3 mol
- D. 4 mol

**Answer:**



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2. Dulong and Petit's law is valid only for

- A. metals
- B. non metals
- C. gaseous element
- D. solid element

**Answer:**



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3. An unknown element forms an oxide. What will be the equivalent weight of the element if the oxygen content is 20% of the above compound by weight?

- A. 16

B. 32

C. 8

D. 64

**Answer:**



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4. The wave number of first line of Balmer series of hydrogen is  $152\text{cm}^{-1}$ .

The wave number of the first Balmer line of  $\text{Li}^{2+}$  ion is

A.  $15200\text{cm}^{-1}$

B.  $60800\text{cm}^{-1}$

C.  $76000\text{cm}^{-1}$

D.  $136800\text{cm}^{-1}$

**Answer:**



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5. Which of the following sets of quantum numbers represents the highest energy of an atom :

A.  $n = 3, l = 0, m = 0, s = +\frac{1}{2}$

B.  $n = 3, l = 1, m = 0, s = +\frac{1}{2}$

C.  $n = 3, l = 2, m = 1, s = +\frac{1}{2}$

D.  $n = 4, l = 0, m = 0, s = +\frac{1}{2}$

**Answer:**

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6. The orbital angular momentum of an electron in 2s orbital is

A.  $+\frac{1}{2} \cdot \frac{h}{2\pi}$

B. zero

C.  $\frac{h}{2\pi}$

D.  $\sqrt{2} \cdot h(2\pi)$

**Answer:**



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7. Lattice energy of an ionic compound depends upon

- A. charge on the ion only
- B. size of the ion only
- C. charge on the ion and size of the ion
- D. packing of the ions only.

**Answer:**



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8. What is the electron affinity?

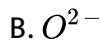
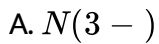


**Answer:**



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**9.** Which of the following is the smallest in size



**Answer:**



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10. The equilibrium constant (k) of a reaction may be written as

A.  $K = e^{-\Delta G / RT}$

B.  $K = e^{-\Delta G^\circ / RT}$

C.  $K = e^{-\Delta H / RT}$

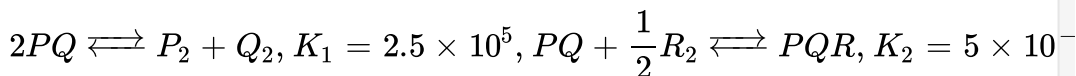
D.  $K = e^{-\Delta H^\circ / RT}$

Answer:



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11. Consider the following reactions in which all the reactants and the products are in gaseous state



The value of  $K_3$  for the equilibrium  $\frac{1}{2}P_2 + \frac{1}{2}O_2 + \frac{1}{2}R_2 \rightleftharpoons PQR$  is

A.  $2.5 \times 10^{-3}$

B.  $2.5 \times 10^3$

C.  $1.0 \times 10^{-5}$

D.  $5 \times 10^3$

**Answer:**

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12. A gaseous mixture was prepared by taking equal mole of CO and  $N_2$ . If the total pressure of the mixture was found 1 atmosphere, the partial pressure of the nitrogen ( $N_2$ ) in the mixture is

A. 0.9 atm

B. 1 atm

C. 0.5 atm

D. 0.8 atm

**Answer:**





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13. If a gas expands at a constant temperature it indicates that

- A. Kinetic energy of the molecules decreases
- B. pressure of the gas increases
- C. kinetic energy of the molecules' remains the same
- D. number of molecules of the gas increase

**Answer:**



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14. The ratio of the rates of diffusion of helium with respect to methane under similar conditions of constant temperature and pressure is

- A. 2
- B. 0.5

C. 16

D. 4

**Answer:**

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15. Oxidation states of P in  $H_4P_2O_5$ ,  $H_4P_2O_6$ ,  $H_4P_2O_7$  are respectively

A. +3, +5, +4

B. +5, +3, +4

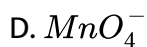
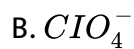
C. +5, +4, +3

D. +3, +4, +5

**Answer:**

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16. Which of the following species can function as an oxidising as well as reducing agent



**Answer:**



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17. The gaseous product produced in reaction between acidic  $H_2O_2$  and  $HOCl$  is



D.  $\text{HClO}_2$

**Answer:**

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**18.** How many number of water molecules are present in a drop of water having mass 0.018?

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**19.** How many nodal planes are present in 5d-orbital.

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**20.** What is the value of azimuthal quantum number for electrons present in 6p orbitals?

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21. What is unit of electron affinity?

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22. The dimension of molar gas constant (R) is -

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23. The volume of an ideal gas of mass  $m$  is  $V$  at pressure  $P$  and temperature  $TK$ . What is molecular weight of the gas.

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24. In a chemical reaction  $A + 2B \rightleftharpoons 2C$ . 2.0 moles of 'A'. 3 moles of B and 2.0 moles of C are placed in a 2.0 L flask and the equilibrium

concentration of C is  $0.5\text{mol/L}$ . Calculate the equilibrium constant ( $k$ ) for the reaction.

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25. Write its conjugate base and conjugate acid of  $HS^-$  ion.

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26. If solubility of silverchromate is 'S' then calculate it's solubility product.

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27. What is comproportionation reaction? Give an example.

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28. What is Fenton's reagent? Write its use



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29. What happens when hydrogen peroxide is added with acidified potassium permanganate solution? Write the equation.



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30. How many number of  $\sigma$  and  $\pi$  bonds are present in the following organic compounds?  $CH_3CH_2CH=CH-C\equiv CH$



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31. What is the volume of concentrated  $H_2SO_4$  that will be required to prepare 2L of a 5(M) sulphuric acid solution?



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32. Calculate the wave length of two lines  $H_{\alpha}$  and  $H_{\beta}$  of Balmer series.

$$R = 109670 \text{ cm}^{-1}$$

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33. State Pauli's exclusion principle. Give an example of an ion which obeys Bohr's theory.

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34. A bulb emits  $2 \times 10^{20}$  photons of wave length 400 nm in one second. Calculate the rate of emission of photons per second.

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35. Arrange the following in order of increasing energy. 3s, 2p, 4s, 3d, 4p.

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**36.** Why the second electron gain enthalpy of oxygen is +ve value?

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**37.** Why ionisation enthalpy of nitrogen is greater than that of oxygen atom?

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**38.** Explain from vander Waal's equation that at very low pressure and at very high temperature the real gases behave as an ideal gases.

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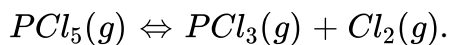
**39.** Why the gas do not liquidity at above the critical temperature?

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40. Deduce the relation between  $K_P$  and  $K_C$  for the following gaseous reaction :  $aA + bB, 'IL + mM$

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41. What will be the effect of addition of an inert gas in the following equilibrium at constant temperature and volume?



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42. Calculate the pH of  $10^{-8}$  (M) HCl solution.

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43. What is common ion effect? Cite an example.

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44. Determine the oxidation state of S atoms in  $Na_2S_4O_6$ .

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45. What is Merk's perhydrol? How it prepared? Write with equation.

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46. What do you meant by hydride gap?

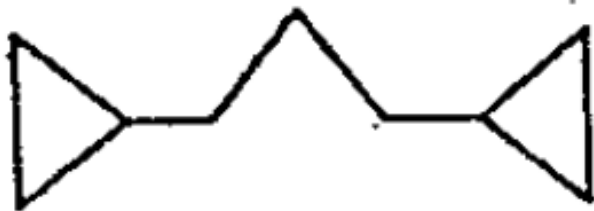
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47. Write the ItJPAC name of the following organic compounds:



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48. Write the IUPAC name of the following organic compounds:

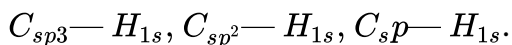


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49. Write the structure of the following organic compound : '1,3-Dimethylcyclohex-1-ene:

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50. Write the increasing bond length of the following bonds and explain :



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51. H-B-H bond angle in  $BH_4^-$  is

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52. For the reaction  $N_2O_4(g) \rightleftharpoons 2NO_2(g)$  at equilibrium the degree of dissociation ( $\alpha$ ) is 28% at temperature 318 K and total pressure 2 atm. Calculate the  $K_P$  and  $K_C$  for the reaction.

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53. Calculate the pH of 0.1 (M)  $NH_4OH$  at  $25^\circ C$ . The dissociation constant of  $NH_4OH$  at  $25^\circ C$ . The dissociation constant of  $NH_4OH$  at  $25^\circ C$  is  $1.76 \times 10^{-5}$ .

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54. State the Hund's rule of maximum multiplicity. Wh  $Fe^{3+}$  ion is more stable than  $Fe^{2+}$  ion?

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55. The energy of electron of H atom is,  $E_n = -\frac{2.18 \times 10^{-18}}{n^2}$  J. How amount of energy is required to remove the electron from  $n = 2$  orbit? What is the value of longest wave length of light required to remove this electron?

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56. Calculate the equivalent wt. of  $Kmno_4$  in Acid medium. [K = 39 Mn = 55]

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57. Write Duiong and Petit's law. How do you determine the atomic weight of element using this law?

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58. Deduce the relation between equivalent weight and atomic weight of an element.

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59. The atomic weight and equivalent weight of an element are 27 and 9 respectively. What is the formula of its chloride?

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