

## CHEMISTRY

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### TANTIA HIGH SCHOOL QUESTION PAPER

#### Exercise

1. The equivalent weight of  $K_2Cr_2O_7$  in acidic medium is expressed in terms of its molecular weight  $M$  as—

A.  $\frac{M}{3}$

B.  $\frac{M}{4}$

C.  $\frac{M}{6}$

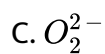
D.  $\frac{M}{7}$

**Answer:**



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2. Which has the smallest bond length?—

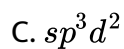
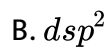


Answer:



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3. What is the hybridisation state of central I atom in  $I_3^-$ ?



D.  $sp^3d$

**Answer:**



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4. Which of the following is the unit is the unit of vander Waal's gas constant 'b'?—

A.  $L^2mol$

B.  $Lmol^{-2}$

C.  $Lmol$

D.  $Lmol^{-1}$

**Answer:**



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5. Which of the following is not possible —

A.  $n=3, l=2, m=0$

B.  $n=1, l=0, m=0$

C.  $n=3, l=3, m=2$

D.  $n=4, l=3, m=-3$

**Answer:**



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6. Which one of the following equation represents de-Broglie relation —

A.  $P = \frac{h}{mv}$

B.  $\lambda = \frac{h}{mv}$

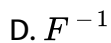
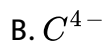
C.  $\lambda = \frac{h}{mp}$

D.  $\lambda m = \frac{u}{p}$

**Answer:**

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7. Which one among the following has the highest radius—



**Answer:**

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8. A vander waal's gas may be have ideally when—

A. the volume is very low

B. the temperature is very high

C. the pressure is low

D. none of these.

**Answer:**



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9. The diagonal-partner of element B is—

A. Li

B. Al

C. Si

D. Mg

**Answer:**



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10. Ratio of  $\pi \rightarrow \sigma$  bonds in benzene is—

A. 1:2

B. 1:6

C. 1:4

D. 1:1

**Answer:**



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11. Which is true for adiabatic process —

A.  $p\Delta v = 0$

B.  $q=+w$

C.  $\Delta E = q$

D.  $q=0$

**Answer:**



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**12.** The reaction  $3O_2 \rightarrow 2O_3$  is endothermic so.  $\Delta H$  for this reaction is—

- A. negative
- B. positive
- C. zero
- D. none of these.

**Answer:**



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**13.** The change in entropy in a reversible adiabatic process is —

- A. infinity



B. zero

C.  $\text{CudT}$

D.  $nRI n = \frac{v_2}{v_1}$

**Answer:**



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**14.** The rms velocity of an ideal gas varies directly with its density as —

A.  $d^2$

B.  $d$

C.  $\sqrt{d}$

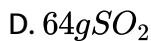
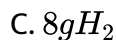
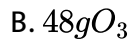
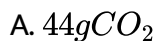
D.  $\frac{1}{\sqrt{d}}$

**Answer:**



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15. Which has the maximum number of molecules among the following—



**Answer:**

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16. Write two limitations of Bohr's atomic model.

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17. Electron affinity of inert elements are positive. Why?

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18. A metallic oxide contains 60% of metal. Calculate the equivalent weight of the metal.

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19. Calculate the equivalent weight of phosphate radical.

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20. Arrange the following ions in ascending order of their ionic radii

$Na^+$ ,  $F^-$ ,  $O^{2-}$ ,  $Mg^{2+}$ .

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21. Is the electronegativity of  $Sn^{2+}$  and  $Sn^{4+}$  equal or different?

Explain.

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22. When an electron jumps down from 5th Bohr orbit to 3rd Bohr orbit in H-atom, then how many numbers of spectral lines will be formed.

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23. State Pauli's exclusion principle.

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24. How many number of electrons are present in one  $HClO_4$  molecule.

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25. An aromatic organic compound has the following composition by weight C = 77.42% H = 7.53% N = 15.05% The vapour density of the compound is 46.5. Find the molecular formula of the compound.

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26. Write the electronic configuration of  $Fe^{2+}$  and  $Cu^+$  ions. Atomic number are 26 and 29.

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27. Why is the radius of cation less compared to that of the corresponding atom? Write the number of lanthanides element.

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28. What do you understand by electro-negativity of an element?

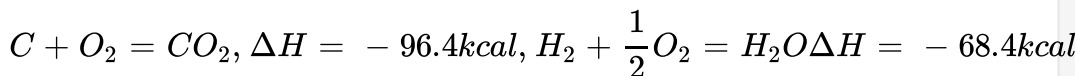
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29. Assuming the reactant and product gases of chemical reaction as ideal, show that for a gaseous reaction  $\Delta H = \Delta U + \Delta nRT$  where  $\Delta H$  and

$\Delta U$  indicate the changes of enthalpy and internal energy, in the reaction.

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30. From the given data find the heat of formation of methane.



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31. What do you mean by entropy? Show that the entropy is a state function.

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32. Draw the Lewis dot picture of the following :  $O_3$ ,  $COCl_2$  and  $N_2O_4$ .

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**33.** Who the shape of the following molecules according to VSEPR rule?

$PCL_5$ ,  $SF_6$  and  $NH_3$ .

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**34.** Express the relation between the rate of diffusion of a gaseous substance with its density by Graham's Law.

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**35.** A mixture of hydrogen and oxygen at one bar pressure contains 20% by weight of hydrogen. Calculate partial pressure of hydrogen.

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**36.** Write the Vander Walls equation for n'mole of the real gas.

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37. What will be the ratio of rate of diffusion of  $^{235}\text{UF}_6$  and  $^{238}\text{UF}_6$ ?

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38. Write the postulates of kinetic theory of gases.

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39. Define Gibb's free energy.

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40. Establish  $\Delta G = \Delta H - T\Delta S$ .

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41. Calculate the  $\Delta G^0$  for the reaction  $N_2(g) + O_2(g) \cdot 2NO(g)$  Given  $\Delta H^0 = 180.5K. J$ , and  $\Delta S^0 = 15Jat25^\circ C$ .

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42. Distinguish between sigma and pi bond.

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43. Explain the type of hybridization in the following.  $H_2S$ ,  $SF_4$  and  $BF_3$

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