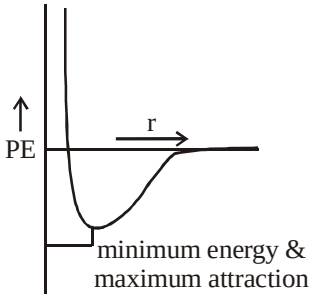
UNIT TEST-02

Subject : Chemistry
Class : XI

Q.1 (3)	**Q.2** (4)	**Q.3** (3)	**Q.4** (4)	**Q.5** (4)	**Q.6** (1)	**Q.7** (3)	**Q.8** (2)	**Q.9** (2)	**Q.10** (1)
Q.11 (1)	**Q.12** (2)	**Q.13** (3)	**Q.14** (1)	**Q.15** (4)	**Q.16** (4)	**Q.17** (2)	**Q.18** (1)	**Q.19** (4)	**Q.20** (4)
Q.21 (1)	**Q.22** (3)	**Q.23** (3)	**Q.24** (1)	**Q.25** (4)	**Q.26** (2)	**Q.27** (3)	**Q.28** (3)	**Q.29** (1)	**Q.30** (3)
Q.31 (4)	**Q.32** (2)	**Q.33** (3)	**Q.34** (1)	**Q.35** (2)	**Q.36** (4)	**Q.37** (3)	**Q.38** (3)	**Q.39** (3)	**Q.40** (3)
Q.41 (4)	**Q.42** (3)	**Q.43** (2)	**Q.44** (3)	**Q.45** (4)	**Q.46** (2)	**Q.47** (3)	**Q.48** (3)	**Q.49** (3)	**Q.50** (2)

Q.1 (3)



Q.2 (4)

Q.3 (3)

NH_3 has lone pair of electron while BF_3 is electron deficient compound so they form a co-ordinate bond $NF_3 \rightarrow BF_3$

Q.4 (4)

In BCl_3 Boron forms 3 bond having $6e^-$ & in PCl_5 phosphorous forms 5 bond i.e. having $10e^-$ so both violates octet rule.

Q.5 (4)

	Bond order
CO	3
CO_2	2
CO_3^{-2}	1.33

Q.6 (1)

Q.7 (3)

Q.8 (2)

Ionic bonding is non directional, whereas covalent bonding is directional. So, CO_2 is directional.

Q.9 (2)

Hydration energy $\propto$ polarising power

$Na^+ < Mg^{2+} < Mg^{3+} < Be^{3+} < Al^{3+}$

Q.10 (1)

Q.11 (1)

Q.12 (2)

Q.13 (3)

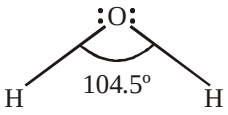
Q.14 (1)

$$B.O. \propto \frac{1}{B.L.}$$

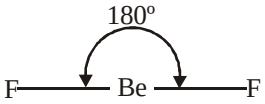
	B.O.
N_2	3
N_2^+	2.5
N_2^-	2.5

Q.15 (4)

The structure of H_2O is angular V-shape and has sp^3-hybridisation and bond angle is 105°. Its dipole moment value is positive or more than zero.



Here $\mu > 0$



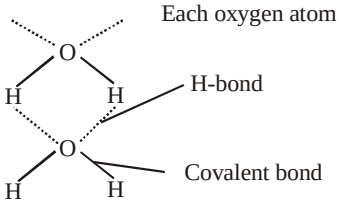
But in BeF_2, structure is linear due to sp-hybridisation ($\mu = 0$). Thus, due to $\mu > 0$, H_2O is dipolar and due to $\mu = 0$, BeF_2 is non-polar.

Q.16 (4)

Q.17 (2)

Bond length decreases with an increase in bond order. Therefore, the order of bond length in these species is $O_2^+ < O_2^- > O_2 < O_2^{2-}$ (bond order – $O_2^+ = 2.5$, $O_2 = 2$, $O_2^- = 1.5$, $O_2^{2-} = 1$).

Q.18 (1)



Q.19 (4)

$\cdot\dot{N} = \dot{O}\cdot$

The molecule contains unpaired electron.

Q.20 (4)

Q.21 (1)

Q.22 (3)

• Adsorption involves bond formation therefore, always exothermic.

• Movement of particles decreases after adsorption therefore, entropy decreases.

Q.23 (3)

$a = \Delta U - W$ $\Delta V = V_2 = V_1$

$\Delta U = q + w$ $\Delta V = 20 - 10$

$= 800\ J + P_{ext} + \Delta V$ $W = -P_{ext}\,\Delta V$

$= 800\ J - 1 \times 10\ L\ atm$ is converted into $JK^{-1}mol^{-1}$ from the above equation

$$= 800\ J - \frac{10\ Latm \times 8.314\ J}{0.0821\ Latm}$$

$$\boxed{\Delta U = -213\ J}$$

Q.24 (1)

From first law of thermodynamic.

$\Delta U = q + W$ Given, $q = +300$ cal ($\therefore$ Heat is absorbed)

$W = -500$ cal

($\therefore$ Work is done on surroundings)

$\therefore \quad \Delta U = q + W = 300 + (-500)$

$= -200$ cal

Q.25 (4)

Here ideal gas expand in vacuum

So work done is Zero .

Q.26 (2)

$$W = -2.303\ n\ RT \log \frac{V_2}{V_1}$$

$= -2.303 \times 1 \times 0.082 \times 300 \log 2$

$= -2.303 \times 1 \times 0.082 \times 300 \times 0.301$

$= -17.1\ J$

Q.27 (3)

Q.28 (3)

We know that internal energy of a gas depends upon its pressure and temperature. Thus, if a gas expands at constant temperature and pressure, than its internal energy remains same.

Q.29 (1)

Q.30 (3)

Q.31 (4)

$\Delta G = \Delta H - T\Delta S$

According to the above reaction if $\Delta H > 0$ and $\Delta S > 0$ then the process is spontaneous at high temperature and non spontaneous at low temperature.

Q.32 (2)

Absolute entropies of ions are relative to H^+ (aq)

Q.33 (3)

Eq. (ii) + Eq. (iii) = Eq. (i)

Q.34 (1)

Q.35 (2)

Q.36 (4)

HNO_2 does not have co-ordinate bond. Structure is H – O – N = O.

Q.37 (3)

No electron as it accept lone pair of electron with the other atom

Q.38 (3)

In $CaCl_2$ calcium loose 2 electrons and transfer to Cl atom thus both acquire outermost 8 electron in valence shell.

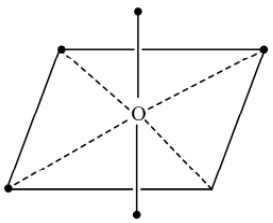
Q.39 (3)

Ionic compound contain opposite charged ions.

Q.40 (3)

Q.41 (4)

sp^3d^2 hybridisation has octahedral structure such that four hybrid orbitals are at 90° w.r.t each other and others two at 90° with first four.



Q.42 (3)

Cl_2 (nonpolar - no difference in electro negativity of atom)

Q.43 (2)

Q.44 (3)
Adiabatic process may involve increase or decrease in temperature of the system.

Q.45 (4)

Q.46 (2)
$HCN + NaOH \rightarrow NaCN + H_2O$
$\Delta H = -12$
$HCl + NaOH \rightarrow NaCl + H_2O$
$\Delta H = -56$
Δ Hionis ation (HCM) $= 12 - (-56)$
$= 44$ KJ

Q.47 (3)
2 atoms of hydrogen forms bond to form H_2 molecule.
$\therefore$ Bond is formed $\Rightarrow$ Attractive forces $\Rightarrow$ Energy is released during the process.

Q.48 (3)
The hest of reaction for an ideal at constant pressure and constant volume are related as
$\therefore \Delta H = \Delta U + \Delta nRT$
$\because q_p = q_v + \Delta nRT$

Q.49 (3)
If ΔH = + ve and ΔS = – ve then the reaction is non-spontaneous

Q.50 (2)
for endothermic reaction $\Rightarrow \Delta H$ = + ve
Also given, ΔS = + ve
$\Delta G = \Delta H - T\Delta S$
(+ ve) – (+ ve)
for feasibility $\Rightarrow \Delta G < 0$
means $TS > \Delta H \Rightarrow 0$