Covalent Bonding

Q1. The valency of sulphur in sulphuric acid is
(a) 2 **(b)** 4 **(c)** 6 **(d)** 8

Q2. The number of electrons involved in the bond formation of molecule are
(a) 2 **(b)** 4 **(c)** 6 **(d)** 10

Q3. The electronic configuration of four elements are given:
$L(1s^2, 2s^2 2p^1)$, $M(1s^2, 2s^2 2p^5)$, $Q(1s^2, 2s^2 2p^6, 3s^1)$ and $R(1s^2, 2s^2 2p^2)$
The element that would most readily form a diatomic molecule is
(a) Q **(b)** M **(c)** R **(d)** L

Q4. In covalency
(a) Electrons are transferred
(b) Electrons are equally shared
(c) The electron of one atom are shared between two atoms
(d) None of the above

Q5. Which compound is highest covalent
(a) $LiCl$ **(b)** LiF **(c)** $LiBr$ **(d)** LiI

Q6. The nature of bonding in graphite is
(a) Covalent **(b)** Ionic **(c)** Metallic **(d)** Coordinate

Q7. Which of the following substances has giant covalent structure
(a) Iodine crystal **(b)** Solid CO_2
(c) Silica **(d)** White phosphorus

Q8. With which of the given pairs CO_2 resembles
(a) $HgCl_2, C_2H_2$ **(b)** $HgCl_2, SnCl_4$
(c) C_2H_2, NO_2 **(d)** N_2O, NO_2

Q9. The electron pair which forms a bond between two similar non-metallic atoms will be
(a) Dissimilar shared between the two
(b) By complete transfer from one atom to other
(c) In a similar spin condition
(d) Equally shared in between the two

Q10. For the formation of covalent bond, the difference in the value of electronegativities should be
(a) Equal to or less than 1.7 **(b)** More than 1.7
(c) 1.7 or more **(d)** None of these

Q11. Which type of bond is formed between similar atoms
(a) Ionic **(b)** Covalent **(c)** Coordinate **(d)** Metallic

Q12. Covalent compounds are generally ..... in water
(a) Soluble **(b)** Insoluble **(c)** Dissociated **(d)** Hydrolysed

Q13. Which one is the electron deficient compound ?
(a) ICl **(b)** NH_3 **(c)** BCl_3 **(d)** PCl_3

Q14. Which among the following elements has the tendency to form covalent compounds ?
(a) Ba **(b)** Be **(c)** Mg **(d)** Ca

Q15. Silicon has 4 electrons in the outermost orbit. In forming the bonds
(a) It gains electrons **(b)** It loses electrons
(c) It shares electrons **(d)** None of these

Q16. Which of the following occurs when two hydrogen atoms bond with each others
(a) Potential energy is lowered **(b)** Kinetic energy is lowered
(c) Electronic motion ceases **(d)** Energy is absorbed

Q17. A bond with maximum covalent character between non-metallic elements is formed
(a) Between identical atoms
(b) Between chemically similar atoms
(c) Between atoms of widely different electronegativities
(d) Between atoms of the same size

Q18. Amongst the following covalent bonding is found in
(a) Sodium chloride **(b)** Magnesium chloride
(c) Water **(d)** Brass

Q19. Indicate the nature of bonding in diamond
(a) Covalent **(b)** Ionic **(c)** Coordinate **(d)** Hydrogen

Q20. Octet rule is not valid for the molecule
(a) CO_2 **(b)** H_2O **(c)** CO **(d)** O_2

Q21. Which of the following compounds are covalent
(a) H_2 **(b)** CaO **(c)** KCl **(d)** Na_2S

Q22. Indicate the nature of bonding in $CCl_4$and CaH_2
(a) Covalent in CCl_4 and electrovalent in CaH_2
(b) Electrovalent in both CCl_4 and CaH_2
(c) Covalent in both CCl_4 and CaH_2
(d) electrovalent in CCl_4 and Covalent in CaH_2

Q23. Which is the most covalent
(a) $C-O$ **(b)** $C-Br$ **(c)** $C-S$ **(d)** $C-F$

Q24. The covalent compound HCl has the ionic character as
(a) The electronegativity of hydrogen is greater than that of chlorine
(b) The electronegativity of hydrogen is equal to that of chlorine
(c) The electronegativity of chlorine is greater than that of hydrogen
(d) Hydrogen and chlorine are gases

Q25. The correct sequence of increasing covalent character is represented by
(a) $LiCl < NaCl < BeCl_2$ **(b)** $BeCl_2 < NaCl < LiCl$
(c) $NaCl < LiCl < BeCl_2$ **(d)** $BeCl_2 < LiCl < NaCl$

Q26. Bond energy of covalent $O-H$ bond in water is
(a) Greater than bond energy of $H-$ bond
(b) Equal to bond energy of $H-$ bond
(c) Less than bond energy of $H-$ bond
(d) None of these

Q27. Solid CH_4 is
(a) Molecular solid **(b)** Ionic solid
(c) Pseudo solid **(d)** Does not exist

Q28. A covalent bond is likely to be formed between two elements which
(a) Have similar electronegativities
(b) Have low ionization energies
(c) Have low melting points
(d) Form ions with a small charge

Q29. The bond between two identical non-metal atoms has a pair of electrons
(a) Unequally shared between the two
(b) Transferred fully from one atom to another
(c) With identical spins
(d) Equally shared between them

Q30. The valency of phosphorus in H_3PO_4 is
(a) 2 **(b)** 5 **(c)** 4 **(d)** 1

Q31. Which of the following substances has covalent bonding
(a) Germanium **(b)** Sodium chloride **(c)** Solid neon **(d)** Copper

Q32. The covalency of nitrogen in HNO_3 is
(a) 0 **(b)** 3 **(c)** 4 **(d)** 5

Q33. Hydrogen chloride molecule contains a
(a) Covalent bond **(b)** Double bond
(c) Coordinate bond **(d)** Electrovalent bond

Q34. As compared to covalent compounds, electrovalent compounds generally have
(a) Low melting points and low boiling points
(b) Low melting points and high boiling points
(c) High melting points and low boiling points
(d) High melting points and high boiling points

Q35. The interatomic distances in H_2 and Cl_2 molecules are 74 and 198pm respectively. The bond length of HCl is
(a) 272pm **(b)** 136pm **(c)** 124pm **(d)** 248pm

Q36. On analysis, a certain compound was found to contain iodine and oxygen in the ratio of 254gm of iodine and 80gm of oxygen. The atomic mass of iodine is 127 and that of oxygen is 16. Which of the following is the formula of the compound
(a) IO **(b)** I_2O **(c)** I_5O_2 **(d)** I_2O_5

Q37. Ionic and covalent bonds are present in
(a) CCl_4 **(b)** $CaCl_2$ **(c)** NH_4Cl **(d)** H_2O

Q38. Highest covalent character is found in
(a) CaF_2 **(b)** $CaCl_2$ **(c)** $CaBr_2$ **(d)** CaI_2

Q39. Among the following which property is commonly exhibited by a covalent compound
(a) High solubility in water **(b)** High electrical conductance
(c) Low boiling point **(d)** High melting point

Q40. Atoms in the water molecule are linked by
(a) Electrovalent bond **(b)** Covalent bond
(c) Coordinate covalent bond **(d)** Odd electron bond

Q41. A covalent bond between two atoms is formed by which of the following
(a) Electron nuclear attraction **(b)** Electron sharing
(c) Electron transfer **(d)** Electrostatic attraction

Q42. The electronic configuration of a metal M is $1s^2, 2s^2 2p^6, 3s^1$. The formula of its oxides will be

(a) MO **(b)** M_2O **(c)** M_2O_3 **(d)** MO_2

Q43. Which of the following statements regarding covalent bond is not true

(a) The electrons are shared between atoms

(b) The bond is non-directional

(c) The strength of the bond depends upon the extent of overlapping

(d) The bond formed may or may not be polar

Q44. If the electronic configuration of $M = 2, 8 and 3$ and that of $A = 2, 8 and 7$, the formula of the compound is

(a) M_2A_3 **(b)** MA_2 **(c)** M_2A **(d)** MA_3 **(e)** M_3A

Q45. The table shown below gives the bond dissociation energies (E_{diss}) for single covalent bonds of carbon (C) atoms with element A, B, C and D. Which element has the smallest atoms

Bond	$E_{diss}(kJmol^{-1}$
$C-A$	240
$C-B$	328
$C-C$	276
$C-D$	485

(a) A **(b)** B **(c)** C **(d)** D

Answer Key:

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