1)	Which of the following elements electronegativity?	s has the <i>lowest</i>	12)	Which atom has the <i>greatest</i> a electrons in a bond between the		
	A) fluorine	C) carbon		A) S	C) Al	
2)	B) oxygen	D) nitrogen	10)	B) P	D) Si	
2)	In which compound do the atom difference in electronegativity?		13)	Which atom has the <i>least</i> attra bond between that atom and a		
	A) NaBr B) LiI	C) KF D) AlCl ₃		A) nitrogenB) fluorine	C) oxygen	
2)	,		10		D) carbon	
3)	As the atoms of the elements in order from top to bottom, their e	1	14)	Which of the following compo character?		
	A) increasesB) remains the same			A) NO B) HCl	C) KI D) MgS	
	C) decreases		15)	Which compound has the <i>leas</i> .	. –	
4)	Compounds with the greatest ion	nic character would form	15)	A) KCl	C) CCl ₄	
.,	when fluorine reacts with			B) $CaCl_2$	D) AlCl ₃	
	A) Group 13 elements		10	_		
	B) noble gases		16)	Which bond has the <i>greatest</i> d	-	
	C) alkali metals			A) K—Cl	C) I—Cl	
-	D) metalloids (semimetals)			B) CI_CI	D) H—Cl	
5)	The <i>greatest</i> degree of ionic char bond between sulfur and	racter would be found in a	17)	Which bond has the greatest ic		
	A) phosphorus	C) chlorine		A) H—F	С) Н—О	
	B) oxygen	D) bromine		B) H—Cl	D) H—N	
6)	If the electronegativity difference between the elements in		18)	Which bond has the greatest d	egree of ionic character?	
-)	compound Na X is 3.1, the elemen			A) Li—Br	C) F—F	
	A) I	C) F		B) H—Cl	D) SO	
	B) Br	D) Cl	19)	Which element would <i>most</i> like	y form an ionic bond with	
7)	Which electronegativity is possil	ole for an alkali metal?		chlorine?		
	A) 1.0	C) 2.0		A) N B) S	C) K D) O	
	B) 3.0	D) 4.0	20)	Given the reaction:		
8)	Two atoms with an electronegative bond that is	vity difference of 0.4 form a		$H_2 + Cl_2 \longrightarrow 2HCl$		
	A) ionic, because electrons are t			Which statement best describes	the energy change as	
	B) covalent, because electrons aC) covalent, because electrons a		bonds are formed and broken in this reaction?			
	D) ionic, because electrons are s			A) The forming of the H—Cl bond releases energy.		
9)	Which atom has the strongest att			B) The forming of the H—Cl t	ond absorbs energy.	
-)		C) Br		C) The breaking of the H—H		
		D) F		D) The breaking of the Cl—Cl	bond releases energy.	
10)	Atoms of which of the following estrongest attraction for electrons?		21)	The forces of attraction that that called	t hold a crystal together are	
	4.) I'	C) chlorine		A) electrovalent	C) ionic	
	B) aluminum	D) silicon		B) covalent	D) van der Waals	
11)	In which compound have electron oxygen atom?	s been transferred to the	22) Which type of bond is formed by the tran from one atom to another?		y the transfer of electrons	
	A) Na ₂ O	C) NO ₂		A) a hydrogen bond		
	B) N ₂ O	D) CO ₂		B) a coordinate covalent bondC) an ionic bond		
				D) a covalent bond		

Name:

23)	Which substance is an io	nic solid?
	A) Fe	C) HCl
	B) Ne	D) LiCl
24)	24) Which type of bonds are formed when calcium atom with oxygen atoms?	
	A) polar covalent	

- B) ionic
- C) coordinate covalent
- D) hydrogen
- 25) A characteristic of ionic solids is that they
 - A) have low boiling points
 - B) have high melting points
 - C) conduct electricity
 - D) are noncrystalline
- 26) Which type of bonding is characteristic of a substance that has a high melting point and electrical conductivity only in the liquid phase?
 - A) ionic
 - B) metallic
 - C) nonpolar covalent
 - D) coordinate covalent
- 27) A crystalline solid has a high melting point and is a good conductor of electricity in the liquid state. This solid could be

A) Hg	C)	CO_2
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- B) C₆H₁₂O₆ D) KCl
- 28) A white crystalline salt conducts electricity when it is melted and when it is dissolved in water. Which type of bond does this salt contain?

A)	ionic	C)	network
B)	covalent	D)	metallic

29) Which substance will conduct electricity in *both* the solid phase and the liquid phase?

A)	H ₂	C)	HCl
B)	AgCl	D)	Ag

30) The electrical conductivity of KI(aq) is *greater* than the electrical conductivity of H₂O because the KI(aq) contains mobile

A) molecules of KI C)	ions	from KI
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- B) molecules of H_2O D) ions from H_2O
- 31) A chemical formula is an expression used to represent
 - A) compounds, only
 - B) elements, only
 - C) mixtures, only
 - D) compounds and elements
- 32) Which atoms are most likely to form covalent bonds?
 - A) metal atoms that share protons
 - B) metal atoms that share electrons
 - C) nonmetal atoms that share protons
 - D) nonmetal atoms that share electrons

- 33) When two atoms form a chemical bond by sharing electrons, the resulting molecule will be
 A) neither polar nor nonpolar
 B) polar, only
 C) nonpolar, only
 D) either polar or nonpolar
 34) The bonds present in silicon carbide (SiC) are
 A) metallic
 C) van der Waals
 B) covalent
 D) ionic
- 35) Which statement is true concerning the reaction $N(g) + N(g) \longrightarrow N_2(g) + energy?$
 - A) A bond is broken and energy is absorbed.
 - B) A bond is formed and energy is released.
 - C) A bond is formed and energy is absorbed.
 - D) A bond is broken and energy is released.
- 36) The correct electron dot formula for hydrogen chloride is
 - A)
 H
 Cl
 C)
 H
 Cl

 B)
 H
 Cl
 D)
 H
 Cl
- 37) Which electron dot diagram represents H₂?
 - A)
 H H •
 C)
 H H

 B)
 H H •
 D)
 H H
- 38) Which is the correct electron-dot formula for a molecule of chlorine?
 - A) CI CI
 C) CI CI •

 B) CI CI •
 D) CI CI •
- 39) Which diagram *best* represents the structure of a water molecule?

- 40) Which formula represents a tetrahedral molecule?
 - A) CaCl₂ C) Br₂
 - B) CH₄ D) HBr
- 41) The four single bonds of a carbon atom are spatially directed toward the corners of a regular
 - A) rectangle
 - B) square D) triangle

C) tetrahedron

- 42) Two atoms of element A unite to form a molecule with the formula A_2 . The bond between the atoms in the molecule is
 - A) ionic C) polar covalent
 - B) nonpolar covalent D) electrovalent

- 43) Which is a nonpolar molecule containing a nonpolar covalent bond?
 - A) I₂ C) CO₂
 - B) H₂O D) NH₃
- 44) Which molecule is nonpolar and contains a nonpolar covalent bond?
 - A) HCl C) HF
 - B) F₂ D) CCl₄
- 45) Which molecule contains a nonpolar covalent bond?
 - A) $H \stackrel{\bullet}{\times} H$ B) $H \stackrel{\bullet}{\bullet} \stackrel{\bullet}{C} \stackrel{\bullet}{\bullet} \stackrel{\bullet}{\bullet}$ C) $H \stackrel{\bullet}{\times} O \stackrel{\bullet}{\bullet} \stackrel{\bullet}{\bullet} \stackrel{\bullet}{H} \stackrel{\bullet}{H} \stackrel{\bullet}{\bullet} \stackrel{\bullet}{H} \stackrel{\bullet$
- 46) Which electron dot formula represents a molecule that contains a nonpolar covalent bond?

A)	x Br Br Br	C) H $\overset{xx}{\bullet}$ F $\overset{x}{\overset{x}{\star}}$
B)	H ∳Br ●	D) Na+ $\begin{bmatrix} x \\ * \\ * \\ * \\ * \\ x \\ x \end{bmatrix}^{-}$

47) Which molecule contains a polar covalent bond?

A) H [●] H	C) N X N X
B) $\begin{array}{c} x \\ x \\ x \\ x \\ x \end{array} \xrightarrow{x} \left[\begin{array}{c} \bullet \bullet \\ \bullet \end{array} \right] \left[\begin{array}{c} \bullet \bullet \\ \bullet \end{array} \right]$	D) H N H H H

48) What type of bonding is found in the molecule HBr?

A)	polar covalent	C)	metallic	

- B) ionic D) nonpolar covalent
- 49) The P-Cl bond in a molecule of PCl₃ is
 - A) polar covalent
 - B) nonpolar covalent
 - C) coordinate covalent
 - D) electrovalent
- 50) Which combination of atoms can form a polar covalent bond?

A)	Na and Br	C)	H and Br
B)	H and H	D)	N and N

- 51) What type of bond exists in a molecule of hydrogen iodide?
 - A) a nonpolar covalent bond with an electronegativity difference between zero and 1.7
 - B) a polar covalent bond with an electronegativity difference of zero
 - C) a nonpolar covalent bond with an electronegativity difference of zero
 - D) a polar covalent bond with an electronegativity difference between zero and 1.7

- 52) The electrons in a bond between two iodine atoms (I₂) are shared
 - A) equally, and the resulting bond is polar
 - B) equally, and the resulting bond is nonpolar
 - C) unequally, and the resulting bond is nonpolar
 - D) unequally, and the resulting bond is polar
- 53) Which formula represents a polar molecule containing polar covalent bonds?
 - A) CO₂ C) H₂O
 - B) Cl₂ D) NaCl
- 54) Which structural formula represents a nonpolar symmetrical molecule?

A)
$$H - C - H$$

H
B) $H - F$
C) H
H
C) H
H
H

55) Which molecule is nonpolar due to a symmetrical distribution of charge?

A)
$$H - CI$$

B) $H - H$

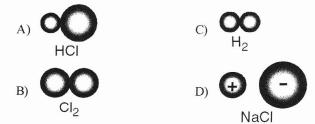
H—N—H D) | H

C) 0 = C = 0

Н

Н

- 56) Which molecule is nonpolar and has a symmetrical shape?
 - A) HCl C) NH₃
 - B) CH₄ D) H₂O
- 57) Which diagram best represents a polar molecule?



58) Which structural formula represents a polar molecule?

A)
$$H = N = H$$

A) $H = C$
B) $H = C = H$
H
D) $N \equiv N$
H
H

59) A molecule with the electron dot formula $H \circ O \circ I_{is}$

A) polarC) nonpolarB) linearD) symmetrical