



# CHEMISTRY

## BOOKS - R SHARMA CHEMISTRY (HINGLISH)

### THE P BLOCK ELEMENTS

#### Follow Up Test 1

1. Elements in which the last electron enters any one of the three  $p$  orbitals of their

respective \_\_\_\_\_ shells are called *p*-block elements.

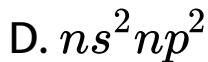
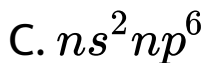
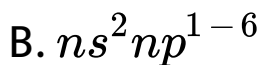
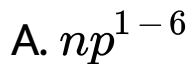
- A. penultimate
- B. antepenultimate
- C. outermost
- D. foremost

**Answer: C**



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2. The general valence shell electronic configuration of  $p$ -block elements is



**Answer: B**



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3. There are \_\_\_\_\_  $p$ -block elements in the periodic table.

A. 30

B. 31

C. 33

D. 32

**Answer: A**



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4. Which of the following is incorrect for  $p$ -block elements?

A. Some of the elements exhibit variable valencies.

B. Some of the elements exhibit variable oxidation numbers.

C. Lighter elements exhibit inert pair effect.

D. The highest oxidation number shown by a  $p$ -block element is equal to the sum of

$ns$ - and  $np$ -electrons in the valence shell.

**Answer: C**



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5.  $p$ -block consists of

- A. metals
- B. nonmetals
- C. metalloids
- D. all of these

**Answer: D**



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**6.** Oxides formed by  $p$ -block elements may be

(*i*) basic

(*ii*) acidic

(*iii*) amphoteric

(*iv*) neutral

A. (*i*), (*ii*)

B. (*ii*), (*iii*)

C. (ii), (iii), (iv)

D. (i), (ii), (iii), (iv)

**Answer: D**



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7. Heavier elements of  $p$ -block in each group do not form

A.  $p_{\pi} - p_{\pi}$  multiple bonds

B.  $d_{\pi} - p_{\pi}$  multiple bonds



C.  $d_{\pi} - d_{\pi}$  multiple bonds

D. all of these

**Answer: A**

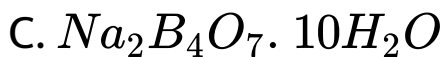
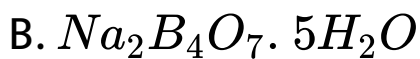


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## Follow Up Test 2

1. Which of the following represents kernite?

A.  $Na_2B_4O_7 \cdot 2H_2O$



**Answer: A**



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2. Aluminium widely occurs in nature as

A. cryolite

B. bauxite

C. feldspars

D. all of these

**Answer: D**



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3. After  $Al$ , the most abundant group 13 elements is

A.  $Tl$

B.  $In$

C. *Ga*

D. *B*

**Answer: C**



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4. Anhydrous alumina ( $Al_2O_3$ ) is known as

A. emerald

B. corundum

C. sapphire

D. ruby

**Answer: B**



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5. Which of the following group 13 elements have pseudo noble gas configuration in their penultimate shell?

A. *B* and *Al*

B. *Al* and *Ga*

C. *Ga* and *In*

D. *In* and *Tl*

**Answer: C**



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6. Which of the following group 13 elements has the smallest atomic radius?

A. *Al*

B. *Ga*

C. *In*

D. *Tl*

**Answer: B**



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7. Which of the group 13 elements has the highest ionization enthalpy?

A. *Al*

B. *Ga*

C. *In*

D. *Tl*

**Answer: D**



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**8.** Which of the group 13 elements has the highest ionization enthalpy?

A. *Al*

B. *Ga*



C. *In*

D. *Tl*

**Answer: A**



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9. Which of the following elements always forms covalent bonds?

A. *Pb*

B. *Si*

C.  $Al$

D.  $B$

**Answer: D**



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**10.** Which of the following is correct regarding the values of ionization enthalpies?

A.  $B$  has lower ionization enthalpy than  $Be$

.

B. *Al* has lower ionization enthalpy than

*Mg*.

C. *Ga* has lower ionization enthalpy than

*Ca*.

D. All of these.

**Answer: D**



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11. Which of the following is incorrect about group 13 elements?

A. They are less electropositive (or metallic) as compared to *s*-block elements.

B. On moving down the group, the electropositive character increases.

C. The standard reduction electrode potentials  $E^\circ (M^{3+} / M)$  become less

negative from *Al* to *Ga* to *In* and the potential becomes positive for *Tl*.

D. None of these.

**Answer: B**



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**Follow Up Test 3**

1. Which of the following has the highest melting point?

A. *Tl*

B. *In*

C. *Ga*

D. *Al*

**Answer: D**



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2. Which of the following has the highest boiling point?

A. *B*

B. *Al*

C. *Ga*

D. *In*

**Answer: A**



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**3. Which of the following is a useful material for measuring high temperatures?**

A. *Al*

B. *Ga*

C. *In*

D. *Tl*

**Answer: B**



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**4.** Which of the following group 13 elements has the highest density?



A. *Al*

B. *Ga*

C. *In*

D. *Tl*

**Answer: D**



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**Follow Up Test 4**

1. The most stable oxidation state of boron is

A. + 3

B. + 1

C. - 3

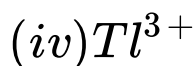
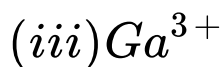
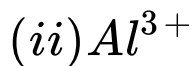
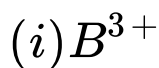
D. - 1

**Answer: A**



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2. Which of the following ions do not exist?



A. (i), (ii), (iii), (iv)

B. (i), (ii), (iii)

C. (ii), (iii)

D. (i), (iv)

**Answer: D**



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3. Which of the following group 13 elements forms univalent halides which are more stable than the trihalides?

A. *Al*

B. *Ga*

C. *Tl*

D. *In*

**Answer: C**



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4. Group 13 elements form complexes much more readily than the  $s$ -block elements because of

- A. smaller ionic size
- B. increased ionic charge
- C. higher charge density
- D. all of these

**Answer: C**



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5. The oxidation number of *Ga* in  $GaCl_2$  is

A. +2

B. +3

C. +1

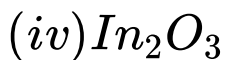
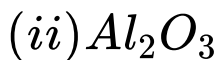
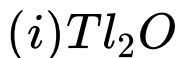
D. both (2) and (3)

**Answer: D**



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6. Which of the following oxides are amphoteric?



A. (i), (ii), (iii)

B. (ii), (iii), (iv)

C. (i), (ii), (iii), (iv)

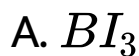
D. (ii), (iii)

**Answer: D**



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7. Which of the following Lewis acids exhibits maximum acidic strength?



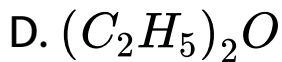


**Answer: A**



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8. Which of the following cannot undergo Lewis acid-base reaction with  $BF_3$ ?

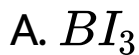


**Answer: C**



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**9. Which of the following is a liquid?**

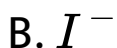
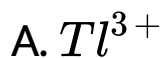


**Answer: D**



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10. The compounds  $TlI_3$  consists of.....ions.



D. both (1) and (2)

**Answer: D**



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11. Which of the following exist as dimers in the anhydrous state and in nonpolar solvents?

(i)  $AlF_3$  , (ii)  $AlCl_3$

(iii)  $AlBr_3$  , (iv)  $AlI_3$

A. (ii), (iii)

B. (ii), (iii), (iv)

C. (i), (ii), (iii)

D. (i), (ii), (iii), (iv)

**Answer: A**



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12. Which of the following gases is evolved when  $Al$  is boiled with caustic potash ?

A.  $H_2$

B.  $O_2$

C. Both  $O_2$  and  $H_2O$

D.  $H_2O$  vapor

**Answer: A**



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13. Which of the following reactions of  $Al$  is known as the thermite reaction?

- A. Reaction with  $N_2$
- B. Reaction with  $O_2$
- C. Reaction with  $NH_3$
- D. Reaction with  $NaOH$

**Answer: B**



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14. The self-protective oxide film on  $Al$  can be removed by

- A. reacting with  $Cl_2$
- B. adding conc.  $HNO_3$
- C. amalgamating with  $Hg$
- D. boiling with water

**Answer: C**



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15. Anhydrous  $AlCl_3$  produces fumes in the air because of

- A. oxidation
- B. reduction
- C. dimerization
- D. hydrolysis

**Answer: D**



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16. Alzheimer's disease is caused by the deposition of.....metal.

A. *Ga*

B. *Al*

C. *In*

D. *Tl*

**Answer: B**



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17. Which of the following group 13 elements does not show the inert pair effect?

A. *Al*

B. *Ga*

C. *In*

D. *Tl*

**Answer: A**



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## Follow Up Test 5

1. The chemical name of borax is

A. sodium orthoborate decahydrate

B. sodium metaborate decahydrate

C. sodium tetraborate decahydrate

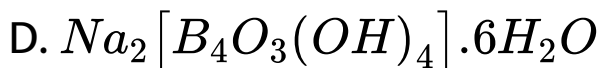
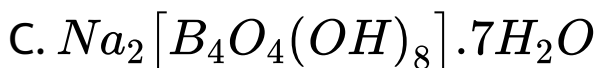
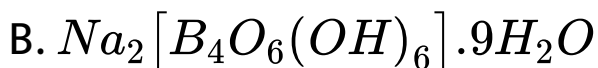
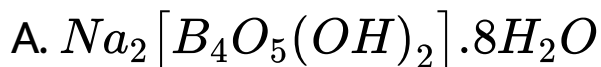
D. sodium borate decahydrate

**Answer: C**



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2. The correct formula of borax is



**Answer: A**



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3. Borax is prepared from

A. boric acid

B. colemanite

C. tincal

D. all of these

**Answer: D**



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4. Aqueous solution of borax is

A. neutral

B. acidic

C. alkaline

D. strongly acidic

**Answer: C**



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5. When borax is dissolved in water

A. both  $B(OH)_3$  and  $[B(OH)_4]^-$

B. only  $B(OH)_3$  is formed

C. only  $[B(OH)_4]^-$  is formed

D. None of these.

**Answer: A**



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6. Which of the following transition metals yields a green colored bead in the borax bead test?

A. *Ni*

B. *Mn*

C. *Cr*

D. *Cu*

**Answer: C**



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7. When borax is heated with ethyl alcohol and concentrated sulphuric acid, vapors of triethylborate are produced. When ignited, these vapors burn with a .....flame.

- A. blue-edged
- B. green-edged
- C. red-edged
- D. brown-edged

**Answer: B**



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8. Boric acid ( $H_3BO_3$ ) prepared from

A. borax

B. boron trihalides

C. colemanite

D. all of these

**Answer: D**



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9. Orthoboric acid ( $H_3BO_3$ ) commonly known as boric acid behaves as a

- A. strong monobasic acid
- B. weak tribasic acid
- C. weak dibasic acid
- D. very weak monobasic acid

**Answer: D**



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10. When boric acid is heated at  $160^{\circ}\text{C}$ , the product is

A. boric anhydride

B. metaboric acid

C. tetraboric acid

D. pyroboric acid

**Answer: C**



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11. Orthoboric acid contains

A. *T*-shaped  $BO_3^{3-}$  units

B. pyramidal  $BO_3^{3-}$  units

C. triangular  $BO_3^{3-}$  units

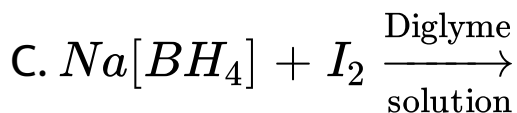
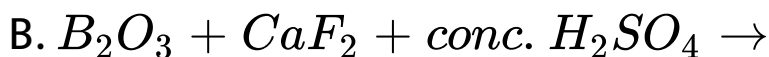
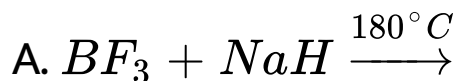
D. irregular tetrahedral  $BO_3^{3-}$  units

**Answer: C**



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12. Which of the following reactions is not used to prepare diborane?

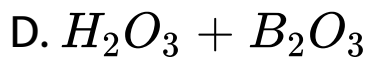
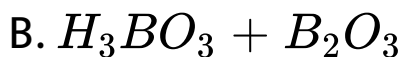


**Answer: B**



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13. Diborane is instantly hydrolyzed by water to give

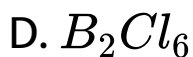
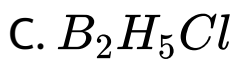
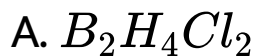


**Answer: A**



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14.  $B_2H_6$  reacts with  $Cl_2$  to produce



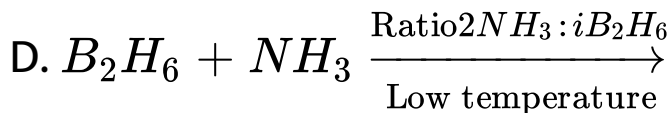
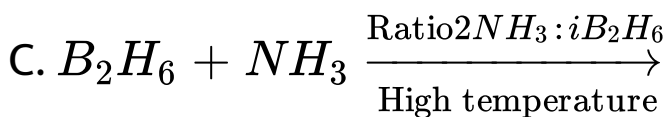
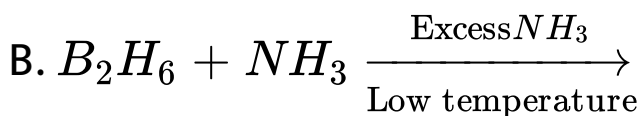
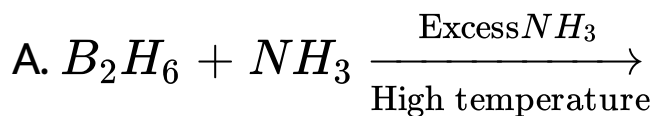
**Answer: B**



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15. Which of the following reactions leads to the formation of borazine?



**Answer: C**



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16. Which of the following is used in the manufacture of heat resistance borosilicate glass?

A. Boron sesquioxide

B. Borax

C. Boric acid

D. All of these

**Answer: D**



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17. Borax is used for.....resistant glazed coating to earthen-wares.

A. heat

B. scratch

C. stain

D. all of these

**Answer: D**



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## Follow Up Test 6

1. Carbon is an essential constituent of all living matter such as

A. fats

B. carbohydrates

C. proteins

D. all of these

**Answer: D**



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2. Which of the following compounds of  $C$  plays a vital role in the carbon cycle?

A.  $CO_2$

B.  $CO$

C. Carbonate

D. Carbide

**Answer: A**



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3. Silicon is the \_\_\_\_\_ element by weight in the earth's crust?

A. most abundant

B. second most abundant

C. third most abundant

D. None of these.

**Answer: B**



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4. Which of the following element was used on the floor in the Hanging Gardens of Babylon (one of the wonders of the ancient world)?

A. *Sn*

B. *Si*

C. *Pb*

D. *Ge*

**Answer: C**



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5. The most important ore of tin is

A. pyrolusite

B. wolframite

C. stannite

D. cassiterite

**Answer: D**



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6. The principal ore of lead is



A. galena

B. anglesite

C. cerussite

D. None of these.

**Answer: A**



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7. If the atomic number of  $C$  is 6, then the atomic number of  $Sn$  will be

A. 50

B. 45

C. 35

D. 40

**Answer: A**



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**8.** The minimum increase in covalent radius is from

A. *C* to *Si*

B. *Si* to *Ge*

C. *Ge* to *Sn*

D. *Sn* to *Pb*

**Answer: D**



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9. Which of the following group 14 element has the lowest first ionization enthalpy?

A. *Si*

B. *Ge*

C. *Sn*

D. *Pb*

**Answer: C**



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**10.** Which of the following has the lowest melting point?

A. *Pb*

B. *Sn*

C. *Ge*

D. *Si*

**Answer: B**



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**11.** Which of the following has the highest boiling point?

A. *Si*

B. *Ge*

C. *Sn*

D. *Pb*

**Answer: A**



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**12.** Which of the following has the maximum density ?

A. Diamond

B. Silicon

C. Graphite

D. Germanium

**Answer: D**



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**Follow Up Test 7**

1. The most common oxidation number exhibited by  $C$  is

A. +4

B. +2

C. 0

D. -4

**Answer: A**



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2. The most stable divalent compound of carbon is



**Answer: D**



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3. Oxidation numbers +2 and +4 are exhibited by

(i) *Si*

(ii) *Ge*

(iii) *Sn*

(iv) *Pb*

A. (i), (ii), (iii), (iv)

B. (ii), (iii), (iv)

C. (i), (ii), (iii)

D. (iii), (iv)

**Answer: B**



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4. On descending group 14,

A. the stability of the +4 oxidation state

decreases

B. the stability of the +2 oxidation state

increases

C. the tendency of the inert pair effect decreases

D. both (1) and (2)

**Answer: D**



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5. Carbon, the first member of group 14, shows an anomalous behavior because of

(i) its exceptionally small atomic and ionic size

(ii) its higher electronegativity

(*iii*) its higher ionization enthalpy

(*iv*) the absence of vacant *d*-orbitals in the valence shell

A. (*i*), (*ii*)

B. (*ii*), (*iii*)

C. (*iii*), (*iv*)

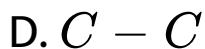
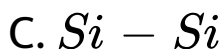
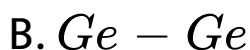
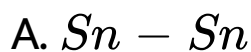
D. (*i*), (*ii*), (*iii*), (*iv*)

**Answer: D**



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6. Which of the following bonds has the minimum bond enthalpy?



**Answer: A**



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7. Which of the following elements shows the strongest catenation property?

A. *Si*

B. *C*

C. *Sn*

D. *Pb*

**Answer: B**



**Watch Video Solution**

8. At room temperature,  $CO_2$  is a gas while  $SiO_2$  is a solid because

A.  $CO_2$  is nonpolar but  $SiO_2$  is polar

B.  $SiO_2$  has higher molecular mass than  $CO_2$

C.  $CO_2$  has covalent bonds but  $SiO_2$  has ionic bonds between the  $Si$  and  $O$  atoms

D. None of these.

**Answer: D**





Watch Video Solution

9. Which of the following is correct regarding the shapes of trisilylamine and trimethylamine?

- A. Both are trigonal planar.
- B. Both are trigonal pyramidal.
- C. They are trigonal planar and pyramidal, respectively.

D. They are trigonal pyramidal and planar, respectively.

**Answer: C**



**Watch Video Solution**

**10.** Which of the following are amphoteric oxides?

A.  $CO_2$  and  $SiO_2$

B.  $SiO_2$  and  $GeO_2$

C.  $GeO_2$  and  $SnO_2$

D.  $SnO_2$  and  $PbO_2$

**Answer: D**



**Watch Video Solution**

**11.** Which of the following is a neutral oxide?

A.  $CO$

B.  $GeO$

C.  $SnO$

D.  $PbO$

**Answer: A**



**Watch Video Solution**

**12.** Plumbosolvency means the dissolution of lead in

A. alkalies

B. ordinary water

C. acids

D. hot water

**Answer: B**



**Watch Video Solution**

**13.** Which of the following species decomposes easily?



D.  $PbI_2$

**Answer: C**



**Watch Video Solution**

**14.** The shape and geometry of  $SnCl_4$  is

A. irregular tetrahedral

B. square planar

C. square pyramidal

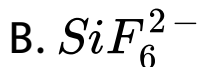
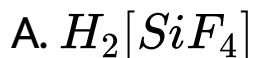
D. regular tetrahedral

**Answer: D**



**Watch Video Solution**

**15.** Silicon tetrafluoride reacts with  $HF$  to form

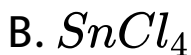


**Answer: B**



**Watch Video Solution**

**16.** Which of the following is not hydrolyzed under normal conditions?





**Answer: C**



**Watch Video Solution**

## Follow Up Test 8

1. How many allotropic forms of carbon are there?

A. Six

B. Five

C. Four

D. Three

**Answer: A**



**Watch Video Solution**

2. Blue diamonds contain a trace of

A. *N*

B. *Al*

C. *S*

D. *Cr*

**Answer: B**



**Watch Video Solution**

**3. The carbon atoms in diamond are**

A.  $sp^3$  -hybridized and are connected by

double bonds

B.  $sp^2$  -hybridized and are connected by

single bonds

C.  $sp^3$  -hybridized and are connected by  
single bonds

D.  $sp^2$  -hybridized and are connected by  
double bonds

**Answer: C**



**Watch Video Solution**

4. Which of the following is the hardest naturally occurring substance?

A.  $C_{60}$  fullerene

B. Graphite

C.  $C_{70}$  fullerene

D. Diamond

**Answer: D**



**Watch Video Solution**

5. Diamond is a/an \_\_\_\_\_ substance.

A. translucent

B. transparent

C. opaque

D. none of these

**Answer: B**



**Watch Video Solution**

6. In diamond, the  $C - C$  bond lengths are \_\_\_\_\_ pm.

A. 140

B. 134

C. 154

D. 125

**Answer: C**



**Watch Video Solution**

7. Graphite consists of layers of  $C$  atoms.

Within the layers, covalent bonds hold the  $C$

atoms in six-membered rings. The  $C - C$

bond length in graphite is.....pm.

A. 141

B. 132

C. 120

D. 154

**Answer: A**



**Watch Video Solution**

**8.** In the diamond form of carbon, there is a network of single, tetrahedrally arranged covalent bonds. The structure of graphite is



quite different from that of diamond. Graphite is composed of many two-dimensional sheets of carbon atoms. The distance between the layers is \_\_\_\_\_pm.

A. 214

B. 335

C. 405

D. 186

**Answer: B**



**Watch Video Solution**

9. In graphite, each  $C$  atom is

A.  $sp^2$ -hybridized and the  $\pi$  bond order of each  $C - C$  bond is  $3/2$

B.  $sp^3$ -hybridized and the  $\pi$  bond order of each  $C - C$  bond is 1

C.  $sp^2$ -hybridized and the  $\pi$  bond order of each  $C - C$  bond is  $1/3$

D.  $sp$ -hybridized and the  $\pi$  bond order of each  $C - C$  bond is  $1/2$

**Answer: C**



**Watch Video Solution**

**10.** Which of the following is not correct about graphite?

A. Graphite cleaves easily between the layers.

B. The density of graphite is higher than that of diamond.

C. Graphite is an excellent lubricant.

D. In graphite, the conduction of electricity can occur in a sheet, but not from one sheet to another.

**Answer: B**



**Watch Video Solution**

**11.** A lead pencil contains \_\_\_\_ mixture.

A. lead-clay

B. charcoal-clay

C. graphite-clay

D. carbon back-clay

**Answer: C**



**Watch Video Solution**

**12.** Graphite can be converted into synthetic diamond under

A. very high pressure and at high temperature

B. very high pressure and at low temperature

C. low pressure and at high temperature

D. low pressure and at low temperature

**Answer: A**



**Watch Video Solution**

**13.** With respect to graphite and diamond, which of the statements given below are correct?

(i) Graphite is harder than diamond.

(ii) Graphite has higher electrical conductivity than diamond.

(iii) Graphite has higher thermal conductivity than diamond.

Graphite has higher  $C - C$  bond order than diamond.

A. (i), (ii), (iii), (iv)

B. (ii), (ii)

C. (ii), (iv)

D. (ii), (iii), (iv)

**Answer: C**



**Watch Video Solution**

**14.** Fullerenes constitute a family of crystalline allotropes of carbon consisting of spherical or ellipsoidal molecules of composition  $C_{2n}$  when  $n$  is  $> =$  \_\_\_\_.



A. 20

B. 30

C. 40

D. 15

**Answer: B**



**Watch Video Solution**

**15.** Which of the fullerenes is called Buckminsterfullerene ?

A.  $C_{70}$

B.  $C_{350}$

C.  $C_{60}$

D.  $C_{120}$

**Answer: C**



**Watch Video Solution**

**16.** Which of the following dissolves in organic solvents to form colored solutions ?

A. Diamond

B. Graphite

C. Charcoal

D.  $C_{60}$

**Answer: D**



**Watch Video Solution**

17. Which of the following is used as black pigment in black ink and as filler in automobile tyres ?

A. Coke

B. Carbon black

C. Charcoal

D. Graphite

**Answer: B**



**Watch Video Solution**

**Follow Up Test 9**

1. Carbon monoxide is always present in

A. automobile exhausts

B. volcanic gases

C. gases coming out of furnaces

D. all of these

**Answer: D**



**Watch Video Solution**

2. Pure  $CO$  gas is prepared in the laboratory by warming\_\_\_\_\_ with concentrated sulphuric acid.

- A. formic acid
- B. oxalic acid
- C. acetic acid
- D. both (1) and (2)

**Answer: A**



**Watch Video Solution**

3.  $CO$  is commercially produced by passing steam over red hot

A. charcoal

B. coke

C. graphite

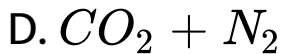
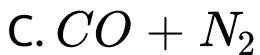
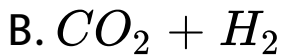
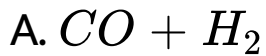
D. diamond

**Answer: B**



**Watch Video Solution**

4. Producer gas is a mixture of



**Answer: C**



**Watch Video Solution**



5. Coal gas contains

(i)  $CO$  , (ii)  $H_2$

(iii)  $CH_4$  , (iv)  $CO_2$

A. (i), (iii)

B. (i), (iv)

C. (i), (ii), (iii)

D. (i), (ii), (iii), (iv)

**Answer: D**



**Watch Video Solution**

6. In carbon monoxide molecule,

A.  $C$  is  $sp^2$ -hybridized but  $O$  is  $sp^3$ -hybridized

B.  $C$  is  $sp$ -hybridized but  $O$  is  $sp^2$ -hybridized

C. Both  $C$  and  $O$  are  $sp^2$ -hybridized

D. Both  $C$  and  $O$  are  $sp$ -hybridized

**Answer: D**



**Watch Video Solution**

7. Which of the following is not correct for carbon monoxide ?

- A. It is a colorless gas.
- B. It is an odorless gas.
- C. It is highly soluble in water.
- D. It is a neutral oxide.

**Answer: C**



**Watch Video Solution**

8. Carbon monoxide on heating with  $NaOH$  at  $200^{\circ}C$  under  $6 - 10atm$  pressure yields.

- A. sodium formate
- B. sodium acetate
- C. sodium oxalate
- D. sodium carbonate

**Answer: A**



**Watch Video Solution**

9. Inhalation of carbon monoxide may cause death because

A. it produces poisonous  $HCN$  inside the body

B. it damages proteins of the body by cleaving peptide bonds

C. it combines with the iron in hemoglobin and blocks the intake of oxygen by blood.

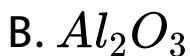
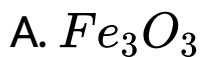
D. it burns the lungs inside

**Answer: C**



**Watch Video Solution**

**10.** Which of the following oxides cannot be reduced with carbon monoxide?



**Answer: B**



**Watch Video Solution**

**11.** Carbon monoxide can be estimated by reaction with

A. ammoniacal solution of cuprous chloride

B. (2) ammoniacal solution of silver nitrate

C.  $PdCl_2$

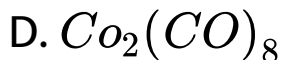
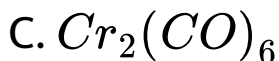
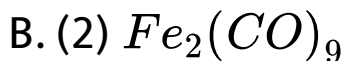
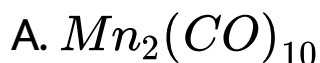
D.  $I_2O_5$

**Answer: D**



**Watch Video Solution**

**12.** Which of the following formula does not represent a metal carbonyl correctly?





**Answer: C**



**Watch Video Solution**

**13.** Which of the following transition metals is purified by the Mond process?

A. *Ni*

B. *Cr*

C. *V*

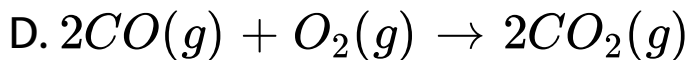
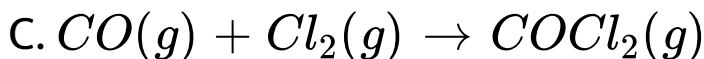
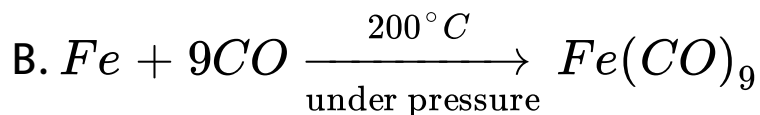
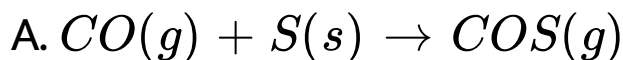
D. *CO*

**Answer: A**



**Watch Video Solution**

**14.** Which of the following reactions is not described correctly?



**Answer: B**



**Watch Video Solution**

**15.** Carbon dioxide is prepared by burning\_\_\_\_\_in excess of air of oxygen.

- A. carbon
- B. fossil fuels
- C. organic compounds
- D. all of these

**Answer: D**



**Watch Video Solution**

**16.** In the laboratory, carbon dioxide is prepared by the action of dilute acids on

A. carbides

B. cyanides

C. carbonates

D. isocyanides

**Answer: C**



**Watch Video Solution**

**17.** Commercially,  $CO_2$  is produced as a byproduct during the manufacture of

(i) quicklime

(ii) ethyl alcohol

(iii) hydrogen

(iv) ammonia

A. (i), (ii), (iii), (iv)

B. (i), (ii) , (iii)

C. (ii), (iii), (iv)

D. (i), (ii)

**Answer: B**



**Watch Video Solution**

**18.** In  $CO_2$  molecule,

A.  $C$  is  $sp$ -hybridized while  $O$ 's are  $sp^2$ -  
hybridized

B.  $C$  is  $sp^2$ -hybridized while  $O$ 's are  $sp$ -hybridized

C. both  $C$ 's and  $O$ 's are  $sp$ -hybridized

D. both  $C$ 's and  $O$ 's are  $sp^2$ -hybridized

**Answer: A**



**Watch Video Solution**

19.  $CO_2$  is a linear, monomeric covalent compound. Its real structure is a resonance hybrid of \_\_\_\_\_ resonance structures.

A. two

B. four

C. three

D. it does not exhibit resonance

**Answer: C**



**Watch Video Solution**

**20.** Which of the following is incorrect regarding carbon dioxide?



- A. It is a dense, colorless, and odorless gas.
- B. It is not poisonous, unlike  $CO$ .
- C. It is neither combustible nor a supporter of combustion.
- D. It is slightly soluble in water and its solubility in water decreases with increase in pressure.

**Answer: D**



**Watch Video Solution**

21. Which of the following metals continue to burn in the atmosphere of  $CO_2$  ?

(i)  $Na$

(ii)  $K$

(iii)  $Mg$

(iv)  $Ca$

A. (i), (ii)

B. (iii), (iv)

C. (i), (ii), (iii), (iv)

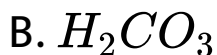
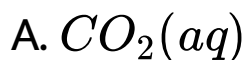
D. (ii), (iii), (iv)

**Answer: C**



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**22.** In aqueous solution, almost all the carbon dioxide is present as

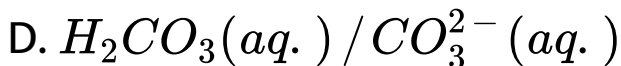
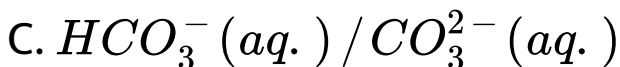
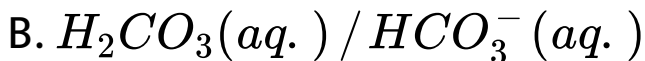
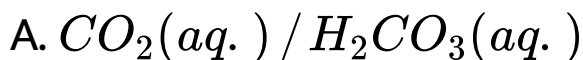


**Answer: A**



**Watch Video Solution**

**23.** Which of the following systems helps to maintain the  $pH$  of blood?



**Answer: B**



**Watch Video Solution**

**24.** Carbon dioxide is a/an \_\_\_\_\_ oxide.

A. neutral

B. basic

C. acidic

D. amphoteric

**Answer: C**



Watch Video Solution

25. Carbon dioxide gas is detected by its action on

- A. lime water
- B. baryta water
- C. both (1) and (2)
- D. blue litmus

**Answer: C**



26. Greenhouse effect is a term used to describe

A. global cooling caused by the excess amount of  $CO_2$  in the atmosphere

B. the warming effect produced by the greenness of the plants

C. the cooling effect produced by the green-colored houses

D. global warming produced by the excess amount of  $CO_2$  in the atmosphere

**Answer: D**



**Watch Video Solution**

**27.** Carbon dioxide unusual because it has no liquid phase at normal atmospheric pressure. Instead, the solid sublimates directly to the gas phase. To obtain the liquid phase at room



temperature, a pressure of \_\_\_\_\_  $MP$  must be applied.

A. 4.7

B. 6.7

C. 5.7

D. 3.7

**Answer: B**



**Watch Video Solution**

28.  $CO_2$  gas can be liquefied under pressure between

A.  $-57^\circ C$  and  $+31^\circ C$

B.  $-47^\circ C$  and  $21^\circ C$

C.  $-67^\circ C$  and  $+41^\circ C$

D.  $-37^\circ C$  and  $11^\circ C$

**Answer: A**



**Watch Video Solution**

29. Solid  $CO_2$  is proved as white snow by

A. expanding the gas at high temperature

B. cooling the gas below Boyel's  
temperature

C. expanding (adiabatically) the  
compressed gas from the cylinder

D. cooling the gas below its inversion  
temperature

**Answer: C**



**Watch Video Solution**

30. Which of the following is the main uses of  $CO_2$  ?

- A. As fire-extinguisher
- B. To manufacture urea
- C. To carbonate urea
- D. As a refrigerant

**Answer: D**



**Watch Video Solution**

## Follow Up Test 10

1. In which of the following form does silicon exist as silica,  $SiO_2$  ?

A. Cristobalite

B. Tridymite

C. Quartz

D. All of these

**Answer: D**



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2. Silicon dioxide is insoluble in water and in all acids except \_\_\_\_\_ acid.

A. hydrochloric

B. hydrofluoric

C. hydrobromic

D. hydroiodic

**Answer: B**



3. Silicon dioxide is mainly used as an optical material because

A. it is hard and strong

B. it is transparent to visible and ultraviolet light

C. it has a very low coefficient of expansion

D. all of these

**Answer: D**



Watch Video Solution

4. Which of the following form  $SiO_2$  is used in modern radio and television broadcasting and mobile radio communications?

A. Quartz

B. Silica gel

C. Kieselghur

D. None of these

**Answer: A**





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5. Silica is a non-volatile acidic oxide and forms complex nixture of silicates only when fused with

A. alkalis

B. alkali carbonates

C. both of these

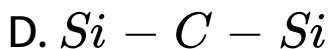
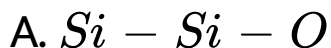
D. none of these

**Answer: C**



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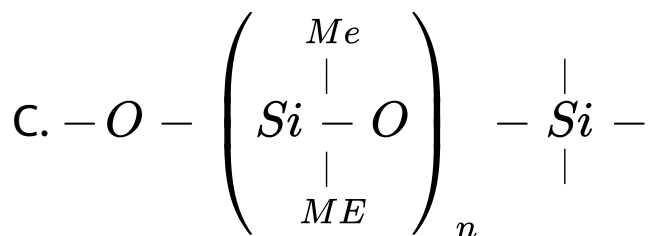
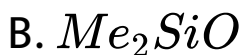
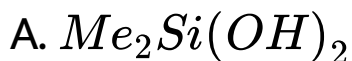
6. Silicones are a group of organosilicon polymers containing\_\_\_\_\_linkages.



**Answer: B**



7.  $Me_2SiCl_2$  on hydrolysis will produce



**Answer: C**



**8.** Silicones are fairly expensive but have many desirable properties such as

(i) strongly water repellent

(ii) good electricity insulators

(iii) non-stick properties

(iv) anti-foaming properties

A. (i), (ii)

B. (ii), (iii)

C. (i), (ii), (iii), (iv)

D. (i), (ii), (iii)

**Answer: C**



**Watch Video Solution**

## Question Bank

1. Which of the following oxide of  $C$  is involved in the process of photosynthesis ?



D.  $C_3O_2$

**Answer: A**



**Watch Video Solution**

2. Which of the following oxides of carbon is known as dry ice?

A. Solid  $CO$

B. Solid  $C_3O_2$

C. Solid  $CO_2$

D. Solid  $C_5O_2$

**Answer: C**



**Watch Video Solution**

**3. Cassiterite is also known as**

A. tin stone

B. stannite

C. tin pyrite

D. black tin

**Answer: A**



**Watch Video Solution**

4. Which of the following statements is incorrect regarding diamond?

A. Each  $C$  atom is tetrahedrally surrounding by four other  $C$  atoms, each at a distance of  $154\text{pm}$



B. The tetrahedra are linked together into a three-dimensional giant molecule.

C. The unit cell has a body-centered cubic structure.

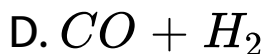
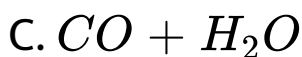
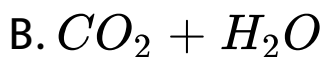
D. Strong covalent bonds extend in all directions.

**Answer: C**



**Watch Video Solution**

5. Formic acid ( $HCOOH$ ) on heating with concentrated  $H_2SO_4$  gives



**Answer: C**



**Watch Video Solution**

6. Water gas is an equimolar mixture of

A.  $CO$  and  $CH_4$

B.  $CO_2$  and  $H_2$

C.  $CO$  and  $H_2$

D.  $CO$  and  $N_2$

**Answer: C**



**Watch Video Solution**

7. Water gas is an blowing steam through

A. red or white hot coke

B. red hot iron

C. red hot copper

D. red hot cobalt

**Answer: A**



**Watch Video Solution**

**8.** Producer gas is made by blowing\_\_\_through  
red hot coke

A.  $N_2$

B. air

C.  $O_2$

D. steam

**Answer: B**



**Watch Video Solution**

**9. Which of the following is an industrial fuel?**

A. Water gas

B. Producer gas

C. Coal gas

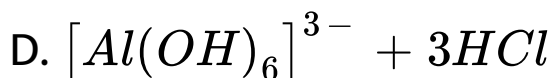
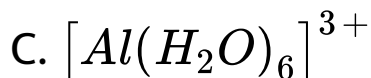
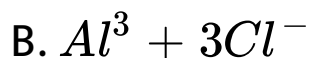
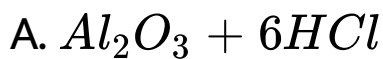
D. All of these

**Answer: D**



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**10.** Aluminium chloride exists as a dimer,  $Al_2Cl_6$  in solid state as well as in solution of non-polar solvents such as benzene. When dissolved in water, it gives :



**Answer: C**



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**11.** The states of hybridisation of boron and oxygen atoms in boric acid ( $H_3BO_3$ ) are respectively :

A.  $sp^2$  and  $sp^2$

B.  $sp^3$  and  $sp^3$

C.  $sp^3$  and  $sp^2$

D.  $sp^2$  and  $sp^3$

**Answer: D**



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**12.** Graphite is soft solid lubricant extremely to melt. The reason for this anomalous behaviour is that graphite:



A. is a non-crystalline substance

B. has molecules of variable molecular mass like polymers

C. has carbon atoms arranged in large plates of rings of strongly bound carbon atoms with weak interplate bonds

D. is an allotrope of diamond

**Answer: C**



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13. A metal, M from chlorides in its +2 and +4 oxidation states. Which of the following statements about these chlorides is correct?

A.  $MCl_2$  is more soluble in anhydrous ethanol than  $MCl_4$

B.  $MCl_2$  is more volatile than  $MCl_4$ .

C.  $MCl_2$  is more easily hydrolyzed than  $MCl_4$ .

D.  $MCl_2$  is more ionic than  $MCl_4$ .

**Answer: D**



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**14.** Which of the following is correct regarding diamond?

(i) Diamond is covalent, yet it has high melting point.

(ii) It used for cutting glass, making borers for rock drilling, and for making abrasives.

(iii) It is used for making precious gems and jewellery.

(iv) It is used for making files for drawing these wires from metals.

A. (i), (ii)

B. (i), (ii), (iii)

C. (i), (ii), (iii), (iv)

D. (i), (iii), (iv)

**Answer: C**



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**15.** The interlayer distance in graphite is

A. the same as the covalent radius of carbon

B. more than twice the covalent radius of carbon

C. many times larger than the covalent radius of carbon

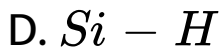
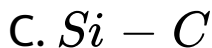
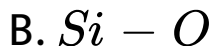
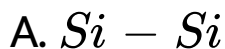
D. very short, and the layers are tightly packed

**Answer: B**



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**16.** Which of the following has the highest bond enthalphy?

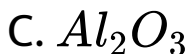
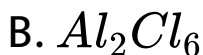


**Answer: B**



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**17.** Heating an aqueous solution of aluminium chloride to dryness will give



**Answer: C**



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**18.** Which is correct for the structure of diborane ?

A. four  $2C - 2e^-$  bonds and four  $3C - 2e^-$  bonds

B. two  $2C - 2e^-$  bonds and two  $3C - 2e^-$  bonds



C. two  $2C - 2e^-$  bonds and four

$3C - 2e^-$  bonds

D. four  $2C - 2e^-$  bonds and two

$3C - 2e^-$  bonds

**Answer: D**



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**19.** The bond dissociation energy of  $-F$  in  $BF_3$  is  $646 \text{ kJ mol}^{-1}$  whereas that of  $C - F$  in  $CF_4$  is  $515 \text{ kJ mol}^{-1}$ . The correct reason for

higher  $B - F$  bond dissociation energy as compared to that of  $C - F$  is

A. lower degree of  $p_\pi - p_\pi$  interaction between  $B$  and  $F$  in  $BF_3$  than that between  $C$  and  $F$  in  $CF_4$

B. significant  $p_\pi - p_\pi$  interaction between  $B$  and  $F$  in  $BF_3$  whereas there is no possibility of such interaction between  $C$  and  $F$  in  $CF_4$

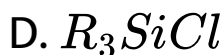
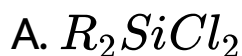
- C. stronger  $\sigma$  bond between  $B$  and  $F$  in  $BF_3$  as compared to that between  $C$  and  $F$  in  $CF_4$
- D. smaller size of  $B$  atom as compared to that of  $C$  atom

**Answer: B**



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20. Among the following substituted silanes, the one which will give rise to cross linked silicon polymer on hydrolysis is

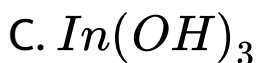
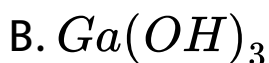
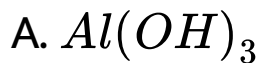


**Answer: C**



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21. Which of the following is water-soluble and strongly basic?

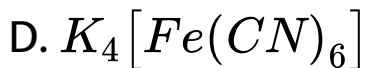
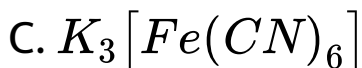
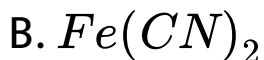


**Answer: D**



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22. Carbon monoxide can be prepared in the laboratory by the action of conc.  $H_2SO_4$  on



**Answer: D**



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23. Which of the following is incorrect regarding carbon monoxide?

A. The carbon-oxygen bond in  $CO$  is very short ( $113\text{pm}$ ), about the length that would be expected for a triple bond.

B. The triple bond between  $C$  and  $O$  in  $CO$  is the strongest bond known with a bond enthalpy of  $1070\text{kJmol}^{-1}$ .

C. The dipole moment of  $CO$  is very high.

D. According to molecular orbital theory,  
the bond order of  $CO$  molecule is 3.

**Answer: C**



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**24.** Carbon dioxide behaves as a supercritical  
fluid ( $SCF$ )

A. below the critical pressure and  
temperature



B. below the critical pressure but above the  
critical temperature

C. above the critical pressure and  
temperature

D. above the critical pressure but below the  
critical temperature

**Answer: C**



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25. Which of the following statements is incorrect?

A. Hydrolysis of  $Me_2SiCl_2$  gives  $Me_2SiO$ .

B. Hydrolysis of  $MeSiCl_3$  gives a cross-linked polymer.

C. Hydrolysis of  $Me_2SiCl_2$  gives a chain polymer.

D. Hydrolysis of  $Me_3SiCl$  gives a disiloxane.

**Answer: A**



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**26.** For making good quality mirrors, the plates of flint glass are used. These are obtained by floating molten glass over a liquid metal which does not solidify before glass. The metal used can be

A. *Sn*

B. *Mg*

C.  $Hg$

D.  $Na$

**Answer: A**

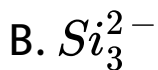


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**Archives**

1. The basic structural unit of silicates is



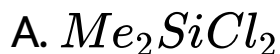


**Answer: A**



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2. Which of these is not a monomer for a high-molecular mass silicone polymer?



B.  $Me_3SiCl$

C.  $PhSiCl_3$

D.  $MeSiCl_3$

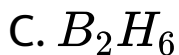
**Answer: B**



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3. Which of the following structure is smaller to graphite?

A.  $B$



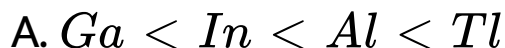
**Answer: D**



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**4.** The stability of +1 oxidation state increases

in the sequence :



B.  $Al < Ga < In < Tl$

C.  $Tl < In < Ga < Al$

D.  $In < Tl < Ga < Al$

**Answer: B**



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5. The straight-chain polymer is formed by the

A. hydrolysis of  $CH_3SiCl_3$  followed by

condensation polymerization



B. hydrolysis of  $(CH_3)_4Si$  addition  
polymerization

C. hydrolysis of  $(CH_3)_2SiCl_2$  followed by  
condensation polymerization

D. hydrolysis of  $(CH_3)_3SiCl$  followed by  
condensation polymerization

**Answer: C**



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6. Which of the following oxidation states are the most characteristics for lead and tin, respectively?

A. +2, +2

B. +4, +2

C. +2, +4

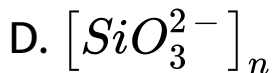
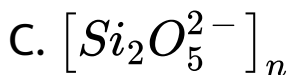
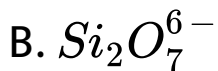
D. +4, +4

**Answer: C**



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7. Which of the following anions is present in the chain structure of silicates?



**Answer: D**



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8. Amorphous form of silica is

A. tridymite

B. Cristobalite

C. fumed silica

D. asbestos

**Answer: C**



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9.  $Al_2O_3$  can be converted to anhydrous  $AlCl_3$  by heating

A.  $Al_2O_3$  with gas  $Cl_2$  gas

B.  $Al_2O_3$  with  $HCl$  gas

C.  $Al_2O_3$  with  $NaCl$  in solid gas

D. a mixture of  $Al_2O_3$  and  $C$  in dry  $Cl_2$  gas

**Answer: D**



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10. Borax is used as a cleaning agent because on dissolving in water, it gives

- A. alkaline solution
- B. acidic solution
- C. bleaching solution
- D. amphoteric solution

**Answer: A**



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11. In diborane, the two  $H - B - H$  angles are nearly

A.  $60^\circ$ ,  $120^\circ$

B.  $95^\circ$ ,  $120^\circ$

C.  $95^\circ$ ,  $150^\circ$

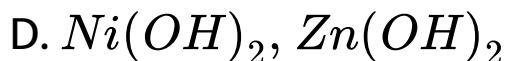
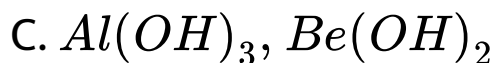
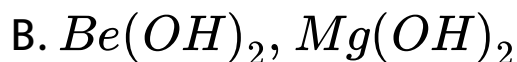
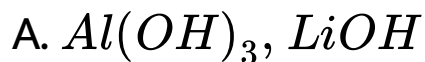
D.  $120^\circ$ ,  $180^\circ$

**Answer: B**



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12. The pair of amphoteric hydroxides is



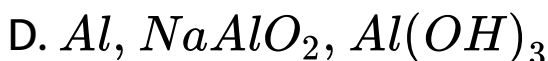
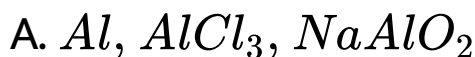
**Answer: C**



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13.  $X$  reacts with  $NaOH$  (aqueous solution) to form  $Y$  and  $H_2$ . The aqueous solution of  $Y$  is heated to  $323 - 333K$  and on passing  $CO_2$  into it,  $Na_2CO_3$  and  $Z$  were formed. When  $Z$  is heated to  $1200^\circ C$ ,  $Al_2O_3$  is formed.  $X$ ,  $Y$ , and  $Z$ , respectively, are

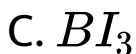
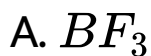


**Answer: D**



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**14.** Which of the following molecule has trigonal planar geometry?



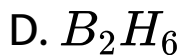
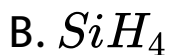
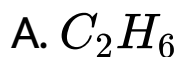
D. All of these

**Answer: D**



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**15.** Which of the following is the electron-deficient molecule?



**Answer: D**



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**16.** Tungsten carbide is an example of

A. substitutional solid solution

B. passive solid solution

C. sandwich solid solution

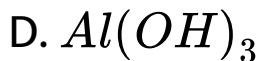
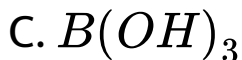
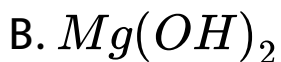
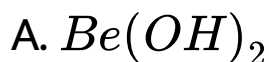
D. interstitial solid solution

**Answer: D**



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17. Which of the following is acidic in nature ?

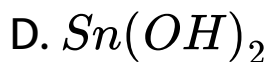
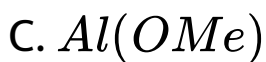
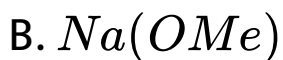
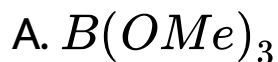


**Answer: C**



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18. Which of the following imparts green color to the burner flame?



**Answer: A**



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19. The liquified metal expanding on solidification is :

A. *Ga*

B. *Al*

C. *Zn*

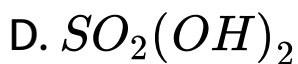
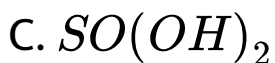
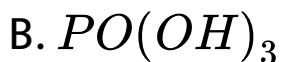
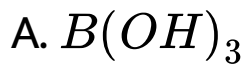
D. *Cu*

**Answer: A**



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20. Which one of the following compounds is not a protoric acid?



**Answer: A**



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21. Lead is maximum in

A. pyrex glass

B. soda glass

C. flint glass

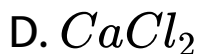
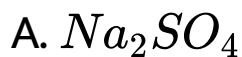
D. jena glass

**Answer: C**



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22. Ripening of fruits can be carried out in the presence of

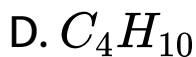
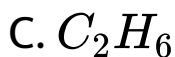


**Answer: C**



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23. Major constituent of biogas is



**Answer:**



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24. Quartz is a/an

A. orthosilicate

B. pyrosilicate

C. sheet silicate

D. three-dimensional silicate

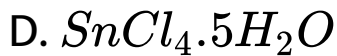
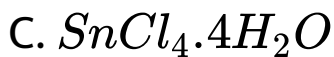
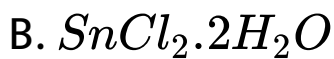
**Answer: D**



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**25. Butter of tin is**

A.  $\text{SnCl}_2 \cdot 5\text{H}_2\text{O}$



**Answer: D**



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**26.** Biogas and producer gas are made up of more than one gaseous substances. Which of the following is correct?

- A. Biogas contains  $CO_2$  but producer gas does not.
- B. Producer gas contains  $CO$  but not  $CO_2$
- C. Both biogas and producer gas have  $N_2$
- D. All of the three above

**Answer: D**



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**27.** The carbon atoms in diamond are

A.  $sp$ -hybridized

B.  $sp^2$ -hybridized

C.  $sp^3$ -hybridized

D. not hybridized

**Answer: C**



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**28.** A layer of coke is spread over bauxite during the extraction of aluminium. This acts as a/an

A. flux

B. slag to remove impurities

C. reducing agent

D. insulation and does not allow heat to  
escape

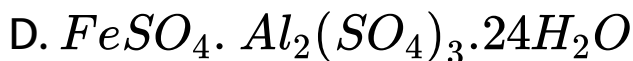
**Answer: D**



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29. Which of the following is known as pseudo alum?



**Answer: D**



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30. Which among  $CH_4$ ,  $SiH_4$ ,  $GeH_4$ , and  $SnH_4$  is the most volatile?

A.  $CH_4$

B.  $SiH_4$

C.  $GeH_4$

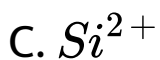
D.  $SnH_4$

**Answer: A**



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31. Which of the following is most stable?



**Answer: D**



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32. Which one of the following is used to remove silicon dioxide in Serpeck's process of purification of bauxite?

A.  $CaO$

B.  $Na_2CO_3$

C. Coke

D. Nickel

**Answer: C**



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33. Aluminium reacts with dil.  $HCl$  and conc.  $NaOH$  solution to liberate \_\_\_\_\_ gases, respectively.

A.  $H_2$  and  $O_2$

B.  $O_2$  and  $H_2$

C.  $H_2$  and  $H_2$

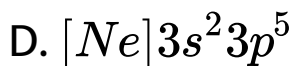
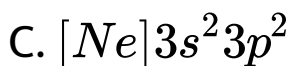
D.  $O_2$  and  $O_2$

**Answer: C**



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34. The electronic configuration of four different elements is given below. Identify the group 14 elements among these.



**Answer: C**



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35. The catenation tendency of  $C$ ,  $Si$ , and  $Ge$  is in the order  $Ge < Si < C$ . The bond energies (in  $kJmol^{-1}$ ) of  $C - C -$ ,  $Si - Si$ , and  $Ge - Ge$  bonds, respectively, are

A. 167, 180, 348

B. 180, 167, 348

C. 348, 167, 180

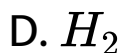
D. 398, 180, 167

**Answer: D**



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36. The compound present in greater proportion in water gas is



**Answer: D**



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37. Two adjacent sheets in graphite are bonded together with

A. van der Waal's forces

B. ionic bonds

C. metallic bonds

D. covalent bonds

**Answer: A**



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38. Which one of the following allotropic forms of carbon is isomorphous with crystalline silicon?

A. Graphite

B. Coal

C. Coke

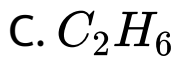
D. Diamond

**Answer: D**



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39. Marsh gas contains

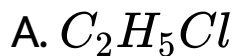


**Answer: A**



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40. Treatment of  $CS_2$  with excess of  $Cl_2$  gives



D. carbon black

**Answer: B**



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