



CHEMISTRY

BOOKS - MTG CHEMISTRY (ENGLISH)

PRACTICE PAPER 2

Mcqs

1. The root mean square velocity of an ideal gas at constant pressure varies with density d as

A. d^2

B. d

C. \sqrt{d}

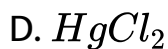
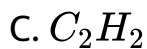
D. $1/\sqrt{d}$

Answer: D



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2. Which of the following does not have a linear structure?

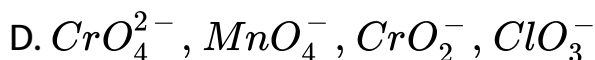
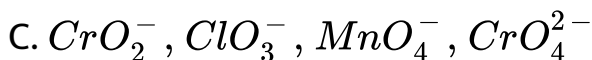
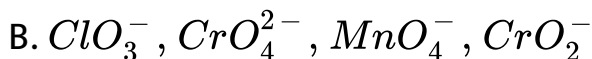
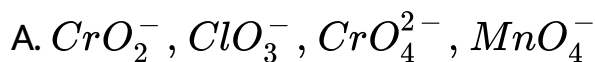


Answer: B



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3. Which of the following arrangements represent increasing oxidation number of the central atom?



Answer: A



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4. Gas deviates from ideal gas behaviour because molecules

- A. are colourless
- B. attract each other
- C. contain covalent bond
- D. show brownian movement

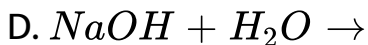
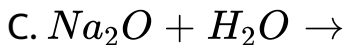
Answer: B



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5. In which one of the following reactions H_2 is liberated?





Answer: A

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6. In the following question, a statement of assertion is followed by a statement of reason, mark the correct choice.

Assertion: When $Q_c = K_c$, reaction is at equilibrium.

Reason: At equilibrium, ΔG° is 0.

- A. both assertion and reason are true and reason is the correct explanation of assertion
- B. both assertion and reason are true but reason is not the correct explanation of assertion
- C. Assertion is true but reason is false.
- D. both assertion and reason are false.

Answer: B

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7. According to Bohr's theory, the angular momentum for an electron of 5th orbit is

A. $2.5h / \pi$

B. $5h / \pi$


C. $25h / \pi$

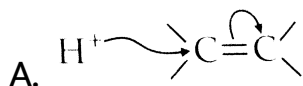
D. $6h / 2\pi$

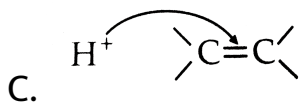
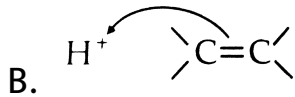
Answer: A



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8. Addition of HCl to an alkene proceeds in two steps. The first step is the attack of H^+ ion to  portion which can be shown as





D. all are possible

Answer: B

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9. Consider the equation $Z = \frac{PV}{nRT}$, which of the following statements is correct?

A. When $Z > 1$, real gases are easier to compress than the ideal gas.

B. When $Z = 1$, real gases get compressed easily

C. When $Z > 1$, real gases are difficult to compress.

D. When $Z = 1$, real gases are difficult to compress

Answer: C

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10. Match the column I with column II and mark the appropriate choice

Column I		Column II	
(A)	$K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24H_2O_{(aq)}$	(i)	Brönsted base
(B)	Salt of weak acid and strong base	(ii)	Neutral
(C)	$H_2PO_4^-$	(iii)	Basic
(D)	Solution of pH 6.5 at high temperature	(iv)	Acidic

A. A-iv,B-iiii,C-i,D-ii

B. A-iv,B-ii,C-i,D-iii

C. A-iii,B-ii,C-i,D-iv

D. A-iv,B-iii,C-i,D-ii

Answer: A



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11. Carbon-60 contains ____pentagons and ____ hexagons.

A. 20,12

B. 12,20

C. 30,30

D. 24,36

Answer: B



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12. SF_4 has _____ shape.

A. T-shape

B. Bent

C. Octahedral

D. see saw

Answer: D



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13. The shape of ClF_3 according to VSEPR model is

A. planar triangle

B. T-shape

C. tetrahedral

D. square planar

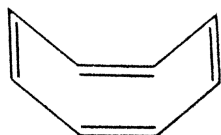
Answer: B



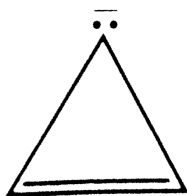
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14. Which of the following is aromatic in nature?

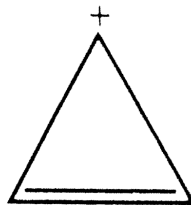
A.



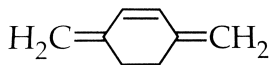
B.



C.



D.

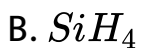


Answer: C

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

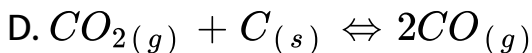
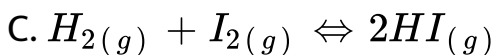
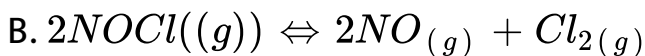
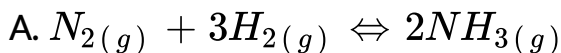
A. CH_4



Answer: A

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16. For which of the following reaction $K_p = K_c$?



Answer: C

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17. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice.

Assertion: Greater the value of van der waals constant 'a' easier is the liquifaction of a gas.

Reason: 'a' indirectly measures the magnitude of attractive forces between the molecules.

A. both assertion and reason are true and reason is the correct explanation of assertion

- B. both assertion and reason are true but reason is not the correct explanation of assertion
- C. Assertion is true but reason is false.
- D. both assertion and reason are false.

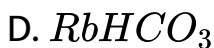
Answer: A



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18. Which of the bicarbonate does not exist in solid state?

- A. $NaHCO_3$
- B. $KHCO_3$
- C. $Ca(HCO_3)_2$



Answer: C

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19. Which of the following statements is incorrect?

- A. One gram atom of carbon contains avogadro's number of atoms.
- B. One mole of oxygen gas contains avogadro's number of molecules.
- C. One mole of hydrogen gas contains avogadro's number of atoms.

D. One mole of electrons stands for 6.02×10^{23} electrons.

Answer: C

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20. Which of the following reactions is said to be entropy driven?

- A. Endothermic reaction with positive entropy change and high temperature
- B. Endothermic reactio with negative entropy change and low temperature

C. Exothermic reaction with positive entropy change
and high temperature

D. Exothermic reaction with negative entropy change
and low temperature

Answer: A



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21. Ultraviolet radiation is absorbed by

A. exosphere

B. ionosphere

C. ozonosphere

D. stratosphere

Answer: D

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22. Which has maximum number of molecules?

A. 7 g N_2

B. 2g H_2

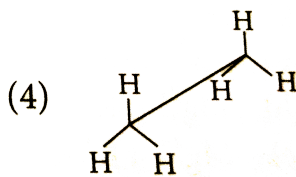
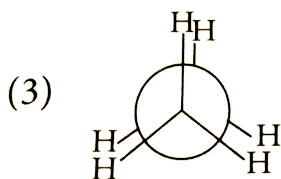
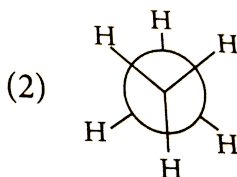
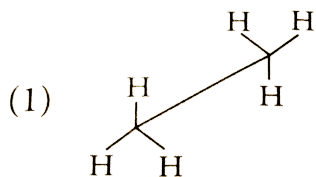
C. 16 g NO_2

D. 16 g O_2

Answer: B

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23. In the following structures which two forms are staggered conformations of ethane?



A. 1 and 4

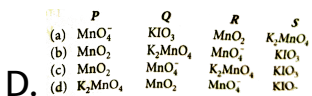
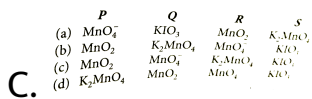
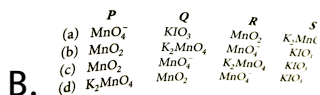
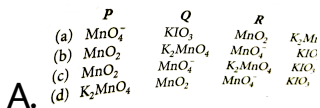
B. 2 and 3

C. 1 and 2

D. 1 and 3

Answer: C

24. p-p overlapping is diagrammatically represented as



Answer: B

25. Which of the following is incorrect?

- A. Hydrogen < Deuterium < Tritium, (%relative abundance)
- B. Hydrogen < Deuterium < Tritium, (density/g L^{-1})
- C. Hydrogen < deuterium < tritium, (boiling point/K)
- D. Hydrogen < Deuterium < tritium, (melting point/K)

Answer: D

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26. Which of the following has +R (resonance) effect?

A. $-CN$

B. $-CHO$

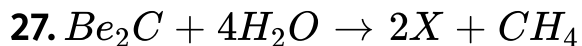
C. $-NH_2$

D. $-NO_2$

Answer: C



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(X) and (Y) formed in the above two reactions is

A. $BeCO_3$ and $Be(OH)_2$ respectively

B. $Be(OH)_2$ and $BeCl_2$ respectively

C. $Be(OH)_2$ and $[Be(OH)_4]^{2-}$ respectively

D. $[Be(OH)_4]^{2-}$ and $BeCl_2$ respectively

Answer: C

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28. The bond order of a molecule is given by

A. the difference between the number of electrons in bonding and antibonding orbitals.

B. total number of electrons in bonding and antibonding orbitals.

C. Twice the difference between the number of electrons in bonding and antibonding orbitals.

D. Half the difference between number of electrons in bonding and antibonding orbitals.

Answer: D



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29. Permanent hardness is due to presence of soluble salts of Mg and Ca in the form of chlorides and sulphates in H_2O . It can be removed by

A. boiling

B. Clark's method

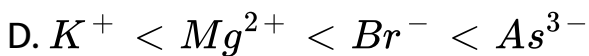
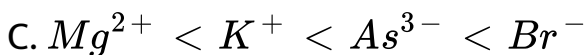
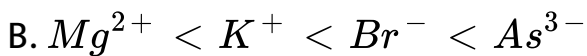
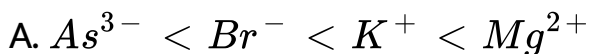
C. treatment with Na_2CO_3

D. all of these

Answer: C

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30. Mark out the correct increasing order of radius.



Answer: B



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31. $\Delta H_{\text{neutralisation}}$ is always

A. positive

B. negative

C. zero

D. positive or negative

Answer: B



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32. Which of the following is correct increasing order of pH of the hydroxide solution of T, P and X?

The diagram shows a simplified periodic table grid. The grid is 6 rows high and 18 columns wide. The first two columns are on the left, and the last two columns are on the right, with a gap in between. Element T is located in the first column, second row from the bottom. Element P is located in the 13th column, second row from the bottom. Element X is located in the 16th column, third row from the bottom.

A. $T < P < X$

B. $X < P < T$

C. $P < T < X$

D. $P < X < T$

Answer: B



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33. The pH of blood is

A. < 7

B. > 7 but < 8

C. > 8 but < 9

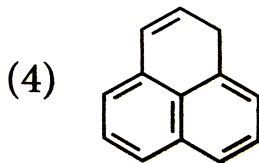
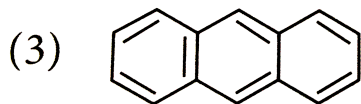
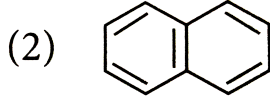
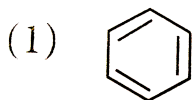
D. > 10

Answer: B



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34. Arrange the following molecules in the increasing order of σ to π bond ratio.



A. $2 < 3 < 4 < 1$

B. $2 < 4 < 3 < 1$

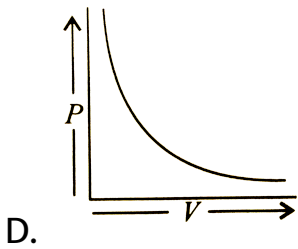
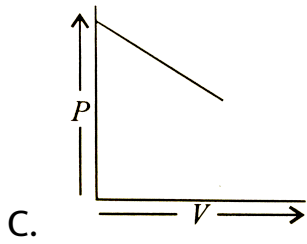
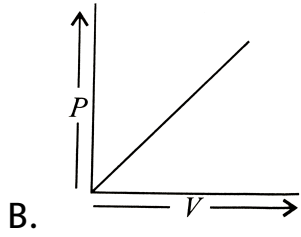
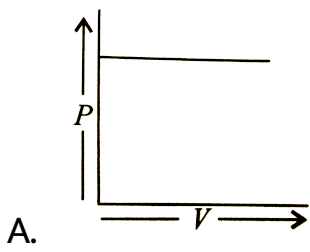
C. $3 < 2 < 1 < 4$

D. $2 < 3 < 1 < 4$

Answer: C

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35. Which of the following is according to Boyle's law?



Answer: D

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36. pH of a 1.0×10^{-8} M solution of HCl is

A. 7.02

B. 6.958

C. 7.4

D. 6.8

Answer: B



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37. The substance used as a adsorbentt in the column

A. Na_2O

B. Na_2SO_4

C. Al_2O_3

D. alum.

Answer: C



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38. Elements of group 14 exhibit oxidation state of

A. +4 only

B. +2 and +4 only

C. +1 and +3 *only*

D. +2 only

Answer: B



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39. With rise in temperature, viscosity of a liquid

- A. increases
- B. decreases
- C. remains constant
- D. may increase or decrease

Answer: B



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40. Air contains 21% of oxygen by volume. The number of moles of O_2 present in 5L of air at STP conditions

A. 2.23×10^{-1}

B. 4.68×10^{-4}

C. 4.68×10^{-2}

D. 0.0234

Answer: C



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41. The ratio of average speed of an oxygen molecule to the RMS speed of a nitrogen molecule at the same temperature is

A. $\left(\frac{3\pi}{7}\right)^{1/2}$

B. $\left(\frac{7}{3\pi}\right)^{1/2}$

C. $\left(\frac{3}{7\pi}\right)^{1/2}$

D. $\left(\frac{7\pi}{3}\right)^{1/2}$

Answer: B



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42. The kinetic energy of 4 mole sof nitrogen gas at $127^{\circ}C$ is ($R = 2 \text{ cal mol}^{-1}K^{-1}$)

A. 4400 cal

B. 3200 cal

C. 4800 cal

D. 1524 cal

Answer: C

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43. Out of N_2O , SO_2 , I_3^+ , I_3^- , H_2O , NO_2^- , N_3^- , the linear species are:

A. NO_2^- , I_3^+ , H_2O

B. N_2O , I_3^+ , N_3^-

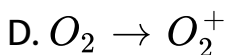
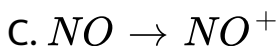
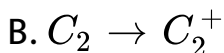
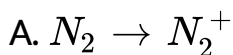
C. N_2O , I_3^- , N_3^-

D. N_3^- , I_3^- , NO_2^-

Answer: C

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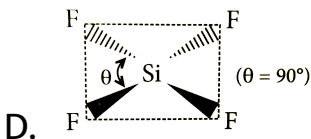
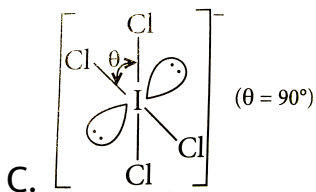
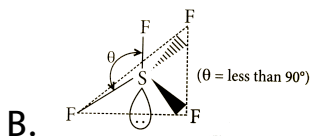
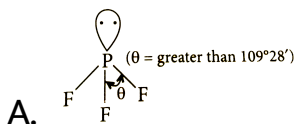
44. In which of the following ionisation processes, the bond order has increased and the magnetic behaviour has changed?



Answer: C

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45. Which of the following structure is correctly drawn according to fundamental idea of VSEPR theory?



Answer: C



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46. Back bonding in BF_3 does not affect

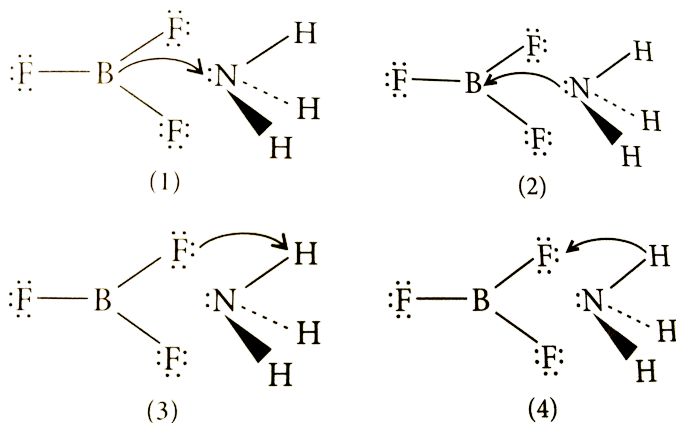
- A. planarity, lewis acidic strength and bond angle
- B. bond length, hybridisation and bond strength
- C. bond angle, planarity, geometry
- D. Lewis acidity, bond length, bond order (B-F)

Answer: C

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47. BF_3 and NH_3 undergo a lewis acid-base reaction forming an adduct. Which picture below correctly

represents the curved arrow notation for the initial lewis acid-base interaction in this reaction, what is the lewis acid and the lewis base?



- A. Picture (1) is correct, NH_3 is the lewis acid and BF_3 is the lewis base
- B. Picture (2) is correct, BF_3 is the lewis acid and NH_3 is the lewis base
- C. Picture (3) is correct, NH_3 is the lewis acid and BF_3 is the lewis base.

D. Picture (4) is correct, BF_3 is the lewis acid and NH_3 is the lewis base.

Answer: B

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48. Ammonium carbamate when heated to $200^\circ C$ gives a mixture of NH_3 and CO_2 vapour with a density of 13. what is the degree of dissociation of ammonium carbamate?

A. $\frac{3}{2}$

B. $\frac{1}{2}$

C. 2

D. 1

Answer: D

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49. For the reaction,

$$A_{(g)} + 2B_{(g)} \rightleftharpoons 3C_{(g)} + 3_{(g)}, K_p = 0.05 \text{ atm at } 1000K$$

. The value of K_c is represented by

A. $5 \times 10^{-4}R$

B. $\frac{5 \times 10^{-4}}{R}$

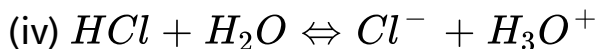
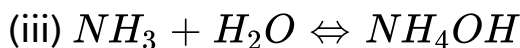
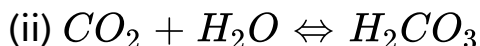
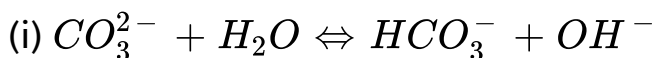
C. $5 \times 10^{-5}R$

D. $\frac{5 \times 10^{-5}}{R}$

Answer: D

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50. Consider the following reaction,



Which of the pairs of reaction proves that water is amphoteric in character?

A. (i) and (ii)

B. (ii) and (iii)

C. (iii) and (iv)

D. (i) and (iii)

Answer: C



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Practice Paper 2

1. The root mean square velocity of an ideal gas at constant pressure varies with density d as

A. d^2

B. d

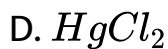
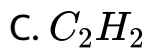
C. \sqrt{d}

D. $1/\sqrt{d}$

Answer: D

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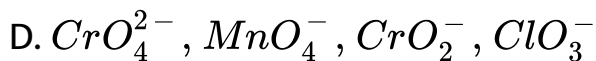
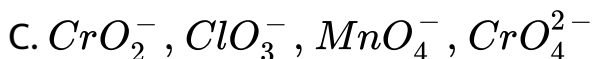
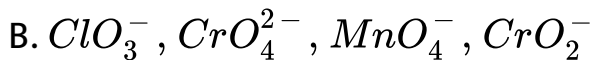
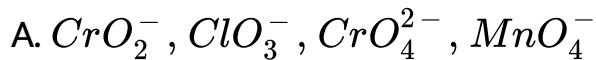
2. Which of the following does not have a linear structure?



Answer: B

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3. Which of the following arrangements represent increasing oxidation number of the central atom?



Answer: A

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4. Gas deviates from ideal gas behaviour because molecules

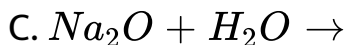
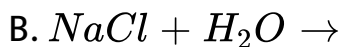
- A. are colourless
- B. attract each other
- C. contain covalent bond
- D. show brownian movement

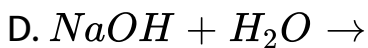
Answer: B



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5. In which one of the following reactions H_2 is liberated?





Answer: A

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6. In the following question, a statement of assertion is followed by a statement of reason, mark the correct choice.

Assertion: When $Q_c = K_c$, reaction is at equilibrium.

Reason: At equilibrium, ΔG° is 0.

A. both assertion and reason are true and reason is the correct explanationn of assertion

- B. both assertion and reason are true but reason is not the correct explanation of assertion
- C. Assertion is true but reason is false.
- D. both assertion and reason are false.

Answer: B



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7. According to Bohr's theory, the angular momentum for an electron of 5^{th} orbit is

A. $2.5h / \pi$

B. $5h / \pi$

C. $25h / \pi$

D. $6h / 2\pi$

Answer: A



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8. Consider the equation $Z = \frac{PV}{nRT}$, which of the following statements is correct?

A. When $Z > 1$, real gases are easier to compress than the ideal gas.

B. When $Z = 1$, real gases get compressed easily

C. When $Z > 1$, real gases are difficult to compress.

D. When $Z = 1$, real gases are difficult to compress

Answer: C

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9. Carbon-60 contains ____ pentagons and ____ hexagons.

A. 20,12

B. 12,20

C. 30,30

D. 24,36

Answer: B

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10. SF_4 has _____ shape.

A. T-shape

B. Bent

C. Octahedral

D. see saw

Answer: D



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11. The shape of ClF_3 according to VSEPR model is

A. planar triangle

B. T-shape

C. tetrahedral

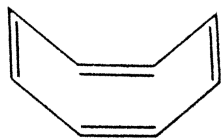
D. square planar

Answer: B

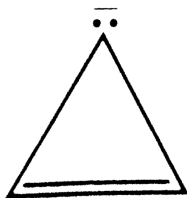
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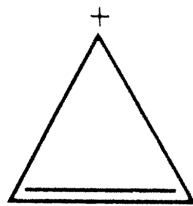
12. Which of the following is aromatic in nature?

A.

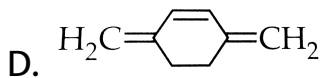


B.





C.



Answer: C

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

A. CH_4

B. SiH_4

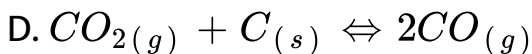
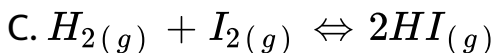
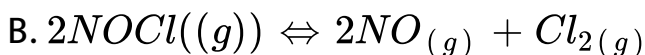
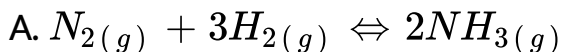
C. GeH_4

D. SnH_4

Answer: A

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14. For which of the following reaction $K_p = K_c$?



Answer: C

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15. In the following question, a statement of assertion is followed by a statement of reason. Mark the correct choice.

Assertion: Greater the value of van der waals constant 'a' easier is the liquifaction of a gas.

Reason: 'a' indirectly measures the magnitude of attractive forces between the molecules.

A. both assertion and reason are true and reason is the correct explanation of assertion

B. both assertion and reason are true but reason is not the correct explanation of assertion

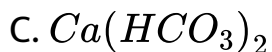
C. Assertion is true but reason is false.

D. both assertion and reason are false.

Answer: A

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16. Which of the bicarbonate does not exist in solid state?



Answer: C

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17. Which of the following statements is incorrect?

A. One gram atom of carbon contains avogadro's number of atoms.

B. One mole of oxygen gas contains avogadro's number of molecules.

C. One mole of hydrogen gas contains avogadro's number of atoms.

D. One mole of electrons stands for 6.02×10^{23} electrons.

Answer: C



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18. Which of the following reactions is said to be entropy driven?

A. Endothermic reaction with positive entropy change and high temperature

B. Endothermic reaction with negative entropy change and low temperature

C. Exothermic reaction with positive entropy change and high temperature

D. Exothermic reaction with negative entropy change and low temperature

Answer: A



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19. Ultraviolet radiation is absorbed by

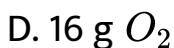
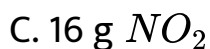
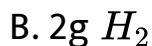
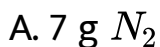
- A. exosphere
- B. ionosphere
- C. ozonosphere
- D. stratosphere

Answer: D



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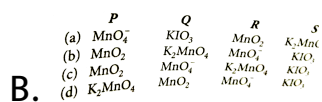
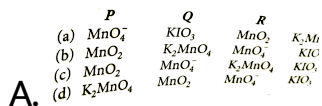
20. Which has maximum number of molecules?



Answer: B

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21. p-p overlapping is diagrammatically represented as



- | | P | Q | R | S |
|-----|------------|------------|------------|------------|
| (a) | MnO_4^- | KIO_3 | MnO_2 | K_2MnO_4 |
| (b) | MnO_2 | K_2MnO_4 | MnO_4^- | KIO_3 |
| (c) | MnO_2 | MnO_4^- | K_2MnO_4 | KIO_3 |
| (d) | K_2MnO_4 | MnO_2 | MnO_4^- | KIO_3 |
- C.

- | | P | Q | R | S |
|-----|------------|------------|------------|------------|
| (a) | MnO_4^- | KIO_3 | MnO_2 | K_2MnO_4 |
| (b) | MnO_2 | K_2MnO_4 | MnO_4^- | KIO_3 |
| (c) | MnO_2 | MnO_4^- | K_2MnO_4 | KIO_3 |
| (d) | K_2MnO_4 | MnO_2 | MnO_4^- | KIO_3 |
- D.

Answer: B

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22. Which of the following is incorrect?

- A. Hydrogen > Deuterium > Tritium, (%relative abundance)
- B. Hydrogen < Deuterium < Tritium, (density/g L^{-1})
- C. Hydrogen < deuterium < tritium, (boiling point/K)
- D. Hydrogen > Deuterium > tritium, (melting point/K)

Answer: D

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23. Which of the following has +R (resonance) effect?

A. $-CN$

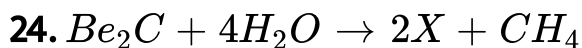
B. $-CHO$

C. $-NH_2$

D. $-NO_2$

Answer: C

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(X) and (Y) formed in the above two reactions is

A. BeCO_3 and $\text{Be}(\text{OH})_2$ respectively

B. $\text{Be}(\text{OH})_2$ and BeCl_2 respectively

C. $\text{Be}(\text{OH})_2$ and $[\text{Be}(\text{OH})_4]^{2-}$ respectively

D. $[\text{Be}(\text{OH})_4]^{2-}$ and BeCl_2 respectively

Answer: C



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25. The bond order of a molecule is given by

A. the difference between the number of electrons in bonding and antibonding orbitals.

B. total number of electrons in bonding and antibonding orbitals.

C. Twice the difference between the number of electrons in bonding and antibonding orbitals.

D. Half the difference between number of electrons in bonding and antibonding orbitals.

Answer: D

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26. Permanent hardness is due to presence of soluble salts of Mg and Ca in the form of chlorides and sulphates in H_2O . It can be removed by

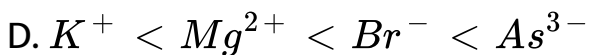
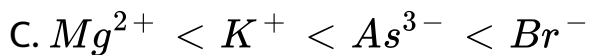
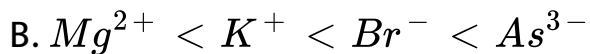
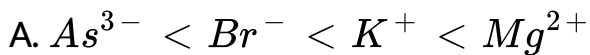
- A. boiling
- B. Clark's method
- C. treatment with Na_2CO_3
- D. all of these

Answer: C



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27. Mark out the correct increasing order of radius.



Answer: B



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28. $\Delta H_{\text{neutralisation}}$ is always

A. positive

B. negative

C. zero

D. positive or negative

Answer: B

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29. The pH of blood is

A. < 7

B. > 7 but < 8

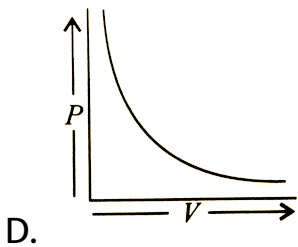
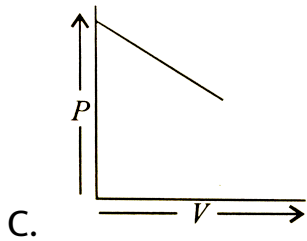
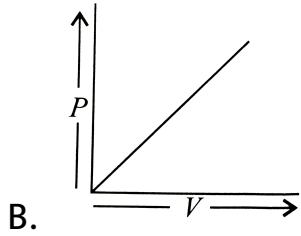
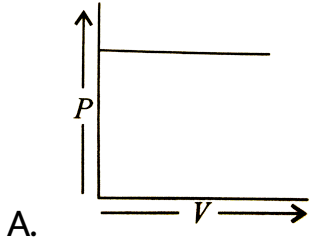
C. > 8 but < 9

D. > 10

Answer: B

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30. Which of the following is according to Boyle's law?



Answer: D

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31. pH of a 1.0×10^{-8} M solution of HCl is

A. 7.02

B. 6.958

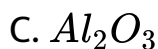
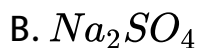
C. 7.4

D. 6.8

Answer: B

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32. The substance used as a adsorbentt in the column



D. alum.

Answer: C



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33. Elements of group 14 exhibit oxidation state of

A. +4 only

B. +2 and +4 only

C. +1 and +3 *only*

D. +2 only

Answer: B



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34. With rise in temperature, viscosity of a liquid

A. increases

B. decreases

C. remains constant

D. may increase or decrease

Answer: B



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35. Air contains 21% of oxygen by volume. The number of moles of O_2 present in 5L of air at STP conditions

A. 2.23×10^{-1}

B. 4.68×10^{-4}

C. 4.68×10^{-2}

D. 0.0234

Answer: C



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36. The ratio of average speed of an oxygen molecule to the RMS speed of a nitrogen molecule at the same temperature is

A. $\left(\frac{3\pi}{7}\right)^{1/2}$

B. $\left(\frac{7}{3\pi}\right)^{1/2}$

C. $\left(\frac{3}{7\pi}\right)^{1/2}$

D. $\left(\frac{7\pi}{3}\right)^{1/2}$

Answer: B



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37. The kinetic energy of 4 mole of nitrogen gas at $127^{\circ}C$ is ($R = 2 \text{ cal mol}^{-1}K^{-1}$)

A. 4400 cal

B. 3200 cal

C. 4800 cal

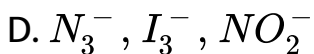
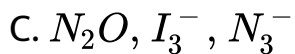
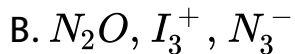
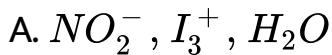
D. 1524 cal

Answer: C



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38. Out of N_2O , SO_2 , I_3^+ , I_3^- , H_2O , NO_2^- , N_3^- , the linear species are:

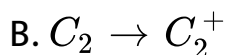
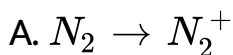


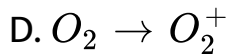
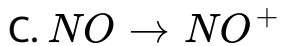
Answer: C



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39. In which of the following ionisation processes, the bond order has increased and the magnetic behaviour has changed?

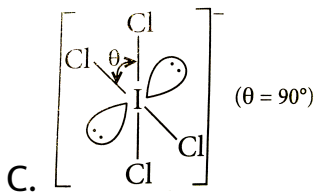
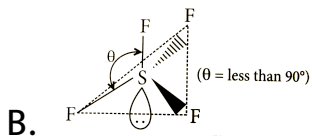
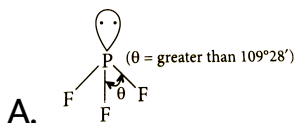


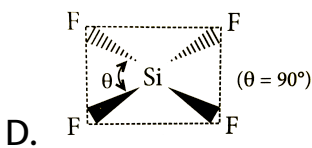


Answer: C

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40. Which of the following structure is correctly drawn according to fundamental idea of VSEPR theory?





Answer: C

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41. Back bonding in BF_3 does not affect

- A. planarity, lewis acidic strength and bond angle
- B. bond length, hybridisation and bond strength
- C. bond angle, planarity, geometry
- D. Lewis acidity, bond length, bond order (B-F)

Answer: C

42. Ammonium carbamate when heated to $200^{\circ}C$ gives a mixture of NH_3 and CO_2 vapour with a density of 13. What is the degree of dissociation of ammonium carbamate?

A. $\frac{3}{2}$

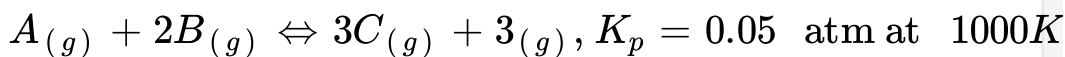
B. $\frac{1}{2}$

C. 2

D. 1

Answer: D

43. For the reaction,



. The value of K_c is represented by

A. $5 \times 10^{-4}R$

B. $\frac{5 \times 10^{-4}}{R}$

C. $5 \times 10^{-5}R$

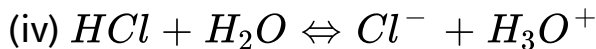
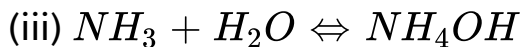
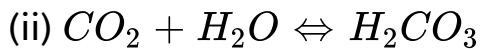
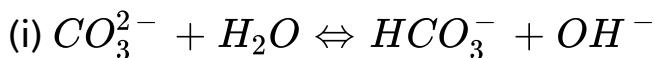
D. $\frac{5 \times 10^{-5}}{R}$

Answer: D



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44. Consider the following reaction,



Which of the pairs of reaction proves that water is amphoteric in character?

A. (i) and (ii)

B. (ii) and (iii)

C. (iii) and (iv)

D. (i) and (iii)

Answer: C



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