CHEMISTRY

BOOKS - FULL MARKS CHEMISTRY (TAMIL ENGLISH)

SAMPLE PAPER 01 (SOLVED)

Part I

1. Carbon forms two oxides, namely carbon monoxide and carbon dioxide. The equivalent mass of which element remains constant?

A. Carbon

B. Oxygen

C. Both carbon and oxygen

D. Neither carbon nor oxygen

Answer: b

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2. Electronic configuration of species M^{2+} is $1s^2 2s^2 2p^6 3s^2 3p^6 3d^6$ and its atomic weight is 56. The number of neutrons in the nucleus of species M is .....

A. 26

B. 22

C. 30

D. 24

Answer: c

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3. Assertion: Helium has the highest value of ionization energy among all the elements known

Reason: Helium has the highest value of electron affinity among all the elements known

A. Both assertion and reason are true and reason is correct explanation for the assertion

B. Both assertion and reason are true but the reason is not the correct explanation for the assertion

C. Assertion is true and the reason is false

D. Both assertion and the reason are false

Answer: c

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4. At room temperature normal hydrogen consists of.....

A. 25% ortho form + 75% para form

B. 50% ortho form + 50% para form

C. 75% ortho form + 25% para form

D. 60% ortho form + 40% para form

Answer: c

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5. Match the following.

List-I	List-II
A. Beryllium	1. Sacrificial anode
B. Calcium	2. X-ray tube radiation window
C. Magnesium	3. Scavenger to remove oxygen in TV
D. Barium	4. Getter in vacuum tubes

Code:	A	B	C	D
(a)	4	2	3	1
(b)	2	4	1	3
(c)	3	1	4	2
(d)	1	3	2	4

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6. Which of the following pair will diffuse at the same rate?

A. CO_2 and N_2O

B. CO_2 and NO

C. CO_2 and CO

D. N_2O and NO

Answer: a

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7. An ideal gas expands from the volume of $1 \times 10^{-3} m^3$ to $1 \times 10^{-2} m^3$ at 300K against a consta pressure at $1 \times 10^5 Nm^{-2}$. The work done is .....

A. $-900J$

B. 900 KJ

C. 270 KJ

D. $-900J$

Answer: a

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8. At a given temperature and pressure, the equilibrium constant values for the equilibria

$$3A_2 + B_2 + 2C \overset{K_1}{\Longleftrightarrow} 2A_3BC \overset{K_2}{\Longleftrightarrow} \frac{3}{2}[A_2] + \frac{1}{2} + C$$

The relation between K_1 and K_2 is .....

A. $K_1 = \frac{1}{\sqrt{k_2}}$

B. $K_2 = K_1^{-\frac{1}{2}}$

C. $K_1^2 = 2K_2$

D. $\frac{K_1}{2} = K_2$

Answer: b

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9. Consider the following statements.

(i) Henry's law is applicable at moderate temperature and pressure only.

(ii)Highly soluble gases obey's Henry's law.

(iii)The gases react with the solvent do not obey Henry's law.

Which of the above statements is/are not correct?

A. (i) only

B. (ii) only

C. (iii) only

D. (i) and (ii)

Answer: b

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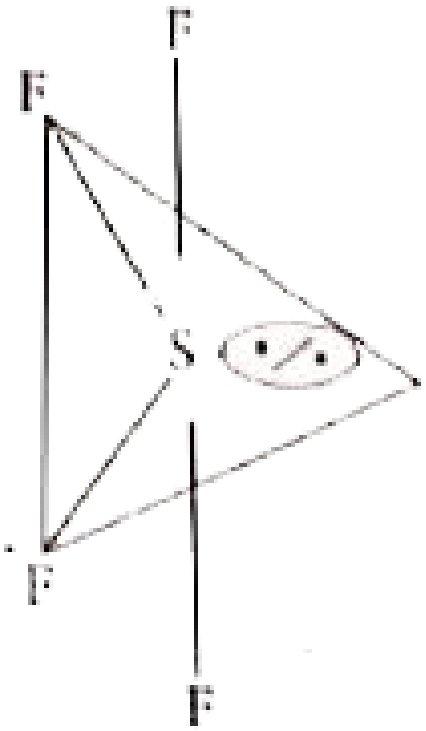
10. Which one of the following is the likely bond angles of sulphur tetrafluoride molecule?



A. $120^\circ, 80^\circ$

B. $109^\circ .28^\circ$

C. 90°

D. $89^\circ, 117^\circ$

Answer: d

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11. The method used to estimate nitrogen in foods and fertilisers is.....

A. Dumas method

B. Kjeldahl's method

C. Carius method

D. Oxide method

Answer: b

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12. Which of the following carbocation will be most stable?

A. PH_3C-

B. CH_3-CH_2-

C. $(CH_3)_2-CH$

D. $CH_2=CH-CH_3$

Answer: d

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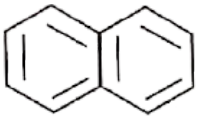
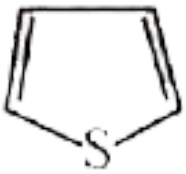
13. Which one of the following is non-aromatic?

A. 

B. 

C. 

D. 

Answer: d

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14. Which one of the following is used as a soil sterilizing agent?

A. Chloroform

B. Chloral

C. iodoform

D. Chloropicrin

Answer: d

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15. Which of the following pair of oxides is responsible for acid rain?

A. $SO_3 + NO_2$

B. $CO_2 + CO$

C. $N_2O + CH_4$

D. $O_2 + H_2$

Answer: a

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Part Ii

1. Calculate the number of moles present in 9g of ethane?

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2. Why halogens act as oxidising agents?

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3. Would it be easier to drink water with a straw on the top of Mount Everest?

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4. $Be(OH)_2$ is amphoteric in nature. Prove it.

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5. An engine operating between $127^\circ C$ and $47^\circ C$ takes some specified amount of heat from high temperature reservoir. Calculate the percentage efficiency of an engine.

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6. Calculate the formal charge on each atom of carbonyl chloride $(COCI_2)$?

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7. Why we need to purify the organic compounds?

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8. What are electrophiles? Give an example.

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9. Complete the reaction ,

$$C_2H_5NH_2 \xrightarrow[-HBr]{C_2H_5Br} ? \xrightarrow[-HBr]{C_2H_5Br} ? \xrightarrow[-HBr]{C_2H_5Br} ?$$

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Part Iii

1. On the formation of SF_6 by the direct combination of Sand F_2, which is the limiting reagent?

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2. Explain about the significance of de-Broglie equation.

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3. What are all the factors that influences electron affinity?

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4. Describe about the biological importance of sodium and potassium.

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5. What are the conventions adopted in writing thermochemical equation?

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6. Calculate the work done when 2-mole of an ideal gas expands reversiblity and isothermally from a volume of 500mL to a volume 2 L at $25^{\circ}C$ and normal pressure.

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7. For a gaseous homogeneous reaction at equilibrium number of moles of products are greater than the number of moles of reactants. Is K_c. is larger or smaller than K_p

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8. Explain-Resonace.

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9. Toluene undergoes nitration easily than benzene. Why?

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Part Iv

1. (i) Explain about the classification of mater.

(ii)What is combination reaction? Give an exanple.

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2. (i) Define-electronegativity.

(ii) How Moseley determined the atomic number of an element using X-rays.

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3. (a) Explain the following observations,

(i) Aerated water bottles are kept under water during summer.

(ii) Liquid ammonia bottle is cooled before opening the seal.

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4. Derive the relation between ΔH and ΔU for an ideal gas.

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5. (i)What are heterogenous equillibrium ? Give an example.v

(ii) The atmospheric oxidation of $NO, 2NO_g + O_{2(g)} \Leftrightarrow 2NO_{2(g)}$ was studied with initial pressure of 1-atm of NO and 1-atm of O_2 At

equillibrium partial pressure of oxygen is 0.52 atm. Calculate K_p of the reaction.

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6. (i) Explain the factors influencing the solubillity of the solutes.

(ii) Why the carbonate drinks are stored in a pressurised container?

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7. (i)Explain-paper chromatography.

(ii) What are stereo-isomerism?

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8. (i)Explain the homolytic fission of a covalent bond?

(ii) Why chloroacetic acid is more acidic than acetic acid?

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9. (i)

$CH_3 - CH(CH_3) - CH(OH) - CH_3 \xrightarrow{H^+ / \Delta} A \xrightarrow{HBr} B$

. Identify A and B (major products).

(ii)Describe the mechanism of sulphonation of benzene.

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10. An organic compounds A of a molecular formula C_6H_6 Which is simple aromatic hydrocarbon. A react with Cl_2 in pressure of $FeCl_3$ to give B. B reacts with NaOH at $350^\circ C$ and 300 atm pressure to give C. B again reacts with ammonia at $250^\circ C$ and 50 atm pressure to give D. Identify A,B,C and D explain the reaction.

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