CHEMISTRY

BOOKS - SURA CHEMISTRY (TAMIL ENGLISH)

GOVT. MODEL QUESTION PAPER - II

Part I

1. Which one of the following is used as a standard for atomic mass.

A. ${}_6C^{12}$

B. ${}_7C^{12}$

C. ${}_6C^{13}$

D. ${}_6C^{14}$

Answer: A

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2. Consider the following sets of quantum numbers

	n	1	m	s
(i)	2	1	-1	$3/2$
(ii)	1	1	1	$+1/2$
(iii)	1	0	$+1$	$-1/2$
(iv)	1	0	0	$-1/2$

Which of the following sets of quantum numbers is not possible ?

A. (i) and (ii)

B. (ii) and (iv)

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

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

Answer: C

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3. The electronic configuration of the elements A and B are $1s^2, 2s^2, 2p^6, 3s^2$ and $1s^2, 2s^2, 2p^5$ respectively . The formula of the ionic compound that can be formed between these elements is

A. AB

B. AB_2

C. A_2B

D. none of the above.

Answer: B

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4. Which one of the following statements is incorrect with regard to ortho and para dihydrogen ?

A. They are stereo isomers

B. Ortho isomer has zero nuclear spin whereas the para isomer has one nuclear spin

C. The para isomer is favoured at low temperatures

D. All of these

Answer: B

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5. The compound (X) on heating gives a colourless gas a nd a residue that is dissolved in water to obtain (B). Excess of CO_2 is bubbled through aqueous solution of B, C is formed. Solid (C) on heating gives back X. (B) is

A. $CaCO_3$

B. $Ca(OH)_2$

C. Na_2CO_3

D. $NaHCO_3$

Answer: B

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6. Which of the following is the correct representation of Charles's law ?

A. 

B. 

C. 

D. 

Answer: C

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7. For one mole of an ideal gas, $\left(\frac{\partial H}{\partial T}\right)_P - \left(\frac{\partial U}{\partial T}\right)$ is equal to

A. 2.303 R

B. $8.314 dm^3 \text{atm mol}^{-1}$

C. 0.0821 lit atm $mol^{-1} K^{-1}$

D. 2.303 log R

Answer: C

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8. For a reaction $AX_5 \Leftrightarrow AX_2, 1\,\%$ of AX_5 is dissociated at a total pressure of 1 atm, the equilibrium constant K_P is approximately equal to

A. 10^{-3}

B. 10^{-4}

C. 0.1×10^{-4}

D. 1

Answer: B

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9. For an ideal solution

A. $\Delta V_{\text{mix}} = 0$

B. $\Delta V_{\text{mix}} \neq 0$

C. $\Delta V_{\text{mix}} > 0$

D. $\Delta V_{\text{mix}} < 0$

Answer: A

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10. Assertion: Oxygen molecule is paramagnetic.

Reason: It has two unpaired electron in its bonding molecular orbital

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: C

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11. The general formula for alkadience is

A. C_nH_{2n}

B. C_nH_{2n-1}

C. C_nH_{2n-2}

D. C_nH_{n-2}

Answer: C

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12. Which of the group has highest +I effect ?

A. CH_3^-

B. $CH_3 - CH_2 -$

C. $(CH_3)_2 - CH -$

D. $(CH_3)_3 - C -$

Answer: D

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13. $(CH_3)_2C = C(CH_3)_2 \xrightarrow[(ii)\, Zn\,/\,H_2O]{(i)\, O_3} X$. X is

A. Acetic acid

B. propanone

C. acetaldehyde

D. Organo zinc compound

Answer: B

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14. Ethanol reacts with methyl magnesium bromide to form

A. Ethane

B. methanol

C. propanone

D. methane

Answer: D

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15. Haemoglobin of the blood forms carboxy haemoglobin with

A. Carbon dioxide

B. carbon tetra chloride

C. carbon monoxide

D. carbamic acid

Answer: C

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Part Ii

1. Predict the oxidation state of carbon in each of the following compounds.

CH_4

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2. Predict the oxidation state of carbon in each of the following compounds.

CCl_4

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3. A macroscopic particle of mass one Kg is moving at a velocity $10ms^{-1}$ calculate its de Broglie wavelength.

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4. Write balanced chemical equation for each of the following chemical reactions.

heating calcium carbonate

5. Write balanced chemical equation for each of the following chemical reactions.

Lithium metal with nitrogen gas

6. Distinguish between diffusion and effusion.

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7. The mass of a non-volatile solute (molar mass 80 g mol^{-1}) which should be dissolved in 92g of toluene to reduce its vapour pressure to $90\ \%$

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8. Predict the shape of ClF_3 and NH_3 using VSEPR theory.

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9. Given one example for β - elemination reaction.

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10. Draw Cis - Trans isomers for 2,3 dichloro - 2 - butene.

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11. Given any two harmful effects of acid rain.

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Part Iii

1. Define ionization energy. The first ionization energy of Nitrogen is greater than that of Oxygen - give appropriate reason.

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2. Write the equation involved in the preparation of hydrogen peroxide from 2 - ethylanthraquinol.

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3. Discuss briefly the similarities between beryllium and aluminium

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4. Calculate ΔH_f° for the reaction $CO_2(g) + H_2(g) \rightarrow CO(g) + H_2O(g)$ given that ΔH_f^0 for $CO_2(g), CO(g)$ and $H_2O(g)$ are -393.5 , -111.31 and -242kJ mol^{-1} respectively.

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5. Define Molarity. If 5.6 g of KOH is present in 250 ml of the solution, calculate the molarity of the solution.

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6. Define equilibrium constant. Given any one application of equilibrium constant.

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7. 0.30 g of a substance gives 0.88 g of carbon dioxide and 0.54 g water. Calculate the percentage of carbon and hydrogen in it.

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8. Given any two methods for the preparation of halo alkanes from alcohols.

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9. Write a note on

Birch reduction

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10. Write a note on

Friedel craft's acylation

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Part Iv

1. An organic compound present in vinegar has 40% carbon , 6.6% hydrogen and 53.4% oxygen. Find the empirical formula of the compound.

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2. Exaplin the uses of plaster of paris.

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3. describe the Aufbau principle.

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4. Write the the electronic configuration of Fe^{2+} ion.

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5. How many radial nodes exist in 2s and 4f orbitals

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6. Explain the pauling method for the determination os ionic radius.

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7. Write a note on deuterium exchange reactions.

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8. Describe fajan's rule.

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9. Draw the Lewis dot structures for sulphurtrioxide.

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10. Find the missing parameters.

$P = 1atm$	$P = 1atm$	$P = 1atm$
$V_1 = 0.3dm^3$	$V_2 = ?$	$V_3 = 0.15dm^3$
$T_1 = 200K$	$T_2 = 300K$	$T_3 = ?K$

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11. State Le-Chatelier principle.

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12. In the equilibrium,

$2A(g) \Leftrightarrow 2B(g) + C_2(g)$

the equilibrium concentrations of A, B and C_2 at 400 K are

$1 \times 10^{-4}M, 2.0 \times 10^{-3}M, 1.5 \times 10^{-4}M$

respectively. The value of K_C for the equilibrium at 400 K is

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13. What are state and path functions? Give two examples.

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14. Give the IUPAC names of the following compounds.

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15. Give the IUPAC names of the following compounds.

$H_3C - CH_2 - COOH$

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16. Give the IUPAC names of the following compounds.

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17. Give the structures for the following compound

3-chlorobutanol

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18. Give the structures for the following compound

Acctaldehyde

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19. Explain Markovnikoff's rule with suitable example .

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20. Describe the mcchanism of addition of HBr to propene,

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21. Write a short note on the following

Dow's process

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22. Write a short note on the following

Darzan's process

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23. What is green chemistry ?

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24. Write a short note on the following

Hyper conjugation

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25. Write a short note on the following

Osmotic pressure

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26. Write a short note on the following

Molar mass

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