RAJA RAVI VARMA GIRLS HIGHER SECONDARY SCHOOL, KILIMANOOR

FIRST YEAR HIGHER SECONDARY PRE-MODEL EXAM 2023

CHEMISTRY

Maximum : 60 Scores

Time: 2 Hours

RRV GIRLS KILIMANOOR Cool off time : 15 Minutes

I. Answer any 4 questions from 1 to 5. Each carries 1 score.

1. Define atomic mass unit (amu)
2. Write the hybridization of carbon atom in ethane molecule.
3. The general valence shell electronic configuration of d – block element is .....
4. Define adiabatic process.
5. Define Homologous series.

II. Answer any 8 questions from 6 to 15. Each carries 2 scores.

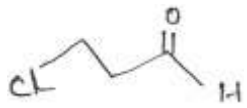
6. Define the following terms.
   i. Molarity ii. Molality
7. What is photoelectric effect? What are its characteristics?
8. State Heisenberg's uncertainty Principle? Give its mathematical form.
9. Explain the variation of the atomic radii of elements along the groups and periods in the periodic table.
10. 10.Define electronegativity. Name any one scale to express the electro negativity of elements.
11. State Farjan's rule ~~re~~garding the partial covalent character of an ionic bond.
12. For a reaction $pcl_{5(g)}$ $pcl_{3(g)} + cl_{2(g)}$, the equilibrium constant K is 1.8 x 10-7 at 298K. calculate the standard Gibbs energy change for the reaction.
13. Consider the following redox reaction:

    $Zn\ (s) + 2HCl_{(aq)} \rightarrow Zncl2_{(aq)} + H2_{(g)}$

    Identify the oxidizing agent and reducing agent in the above reaction.

14. Distinguish electrophiles from nucleophiles. Gove one example for each of them.

Write the IUPAC names of the following compounds.

(a) Cl_2 $CHCH_2OH$ (b) 

III. Answer any 8 questions from 16 to 26. Each carries 3 scores.

15. a) State and illustrate the law of multiple proportions. **(2)**

b) What is limiting reagent? **(1)**

16. What are the observations made by Rutherford in the ∝ - particle scattering experiment?

17. a) Why is potassium considered as an S – Block element? **(1)**

b) The first ionization enthalpies of second period elements generally increase from left to right along the period. Give reason for this general trend **(2)**

18. write the postulates of VSEPR Theory.

19. Illustrate the Hess's law of constant heat summation and write its application.

20. a) For a chemical reaction the reaction quotient (Qc) is greater than the equilibrium constant (Kc). Predict the direction of reaction **(1)**

b) Predict the effect of change in pressure and temperature in the following reaction at equilibrium.

$N2_{(g)} + 3H2_{(g)} \rightleftharpoons 2\ NH3_{(g)}$, ΔH = -92.38 KJ/mol **(2)**

21. Write the Lowry – Bronsted concept of acids and bases with example.

22. Balance the following redox reaction in acidic medium by half reaction method.

$Fe^{2+} + Cr_2O_7^{2-} \rightarrow Fe^{3+} + Cr^{3+}$

23. Briefly explain the principles of the following techniques used in the purification of organic compound.

a) Sublimation b) crystallization c) Distillation

24. a) What is conformations **(1)**

b) Draw the Newman projections of eclipsed and staggered conformations of ethane **(2)**

25. Calculate the enthalpy of formation of methane, given that the enthalpies of combustion of methane, graphite and hydrogen are – 890.2 KJ, -393.4 KJ and – 285.7 KJ respectively.

IV. **Answers any 4 questions from 27 to 31. Each carries 4 scores**.

26. Write the postulates of Bohr's model for hydrogen atom. Mention any two demerits of the model.

27. Write the MO configuration of O_2 and calculate its bond order.

28. a) Define entropy and Gibbs energy **(2)**

b) Write the equation showing the relationship between entropy and Gibbs energy **(1)**

c) calculate the hydronium ion concerntration of a solution whose pH is 4.4. **(1)**

29. a) Explain Wurtz reaction. **(1)**

b) State Huckel rule of aromaticity. **(1)**

(c) $CH_3 – CH = CH_2 + HBr \rightarrow A+B$

i) Identify A and B **(1)**

ii) Which is the major product and why? **(1)**

30. Explain

a) Inductive effect **(1)**

b) Hyper conjugation **(1)**

c) Electromeric effect **(1)**

d) Resonance effect **(1)**

Prepared By:

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