PLUS ONE SAMPLE QUESTION PAPER

CHEMISTRY

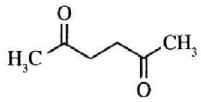
Time : 30 Minutes | Score: 60

General Instructions to candidates :

- There is a 'Cool off time' of 15 minutes in addition to the writing time.
- Use the 'Cool-off time' to get familiar with the questions and to plan your answers.
- Read questions carefully before answering.
- Read the instructions carefully.
- Calculations, figures and graphs should be shown in the answer sheet itself.
- Malayalam version of the questions is also provided.
- Give equations wherever necessary.
- Electronic devices except non-programmable calculators are not allowed in the Examination Hall.

Answer all 4 questions from 1 to 4. Each carries 1 score. **(4×1= 4)**

1. The number of moles of CO_2 present in 220 g of CO_2 is .....
2. The IUPAC name of a compound with atomic number 104 is .....
3. Write the IUPAC name of the compound given below.



4. The alkane which cannot be prepared by Kolbe's electrolytic method is :

Answer all 8 questions from 5 to 12. Each carries 2 scores. **(8 × 2 = 16)**

5. What are iso electronic species? Give two ions that are isoelectronic with Mg^{2+}.
6. Give two demerits of Mendeleev's periodic table.
7. State the first law of thermodynamics and give its mathematical form.
8. Differentiate homogeneous equilibrium from heterogeneous equilibrium. Give an example for each.
9. Write the de Broglie equation and explain the terms.
10. (i) Write the n and l values of a 3s electron.
    (ii) Which among the following is the correct electronic configuration of Nitrogen (Z = 7). Name the rule that forms the basis of your answer.
    (a) $1s^2\ 2s^2\ 2px^2\ 2py^1\ 2pz^0$
    (b) $1s^2\ 2s^2\ 2px^1\ 2py^1\ 2pz^1$.
11. (i) State modern periodic law.
    (ii) How does atomic radius vary down a group ?
12. (i) What is ionization enthalpy ?
    (ii) First ionization enthaly of Nitrogen is greater than that of Oxygen. Why ?

Answer all 8 questions from 13 to 20. Each carries 3 scores. **(8 × 3 = 24)**

13. (i) What is octet rule ?
    (ii) Write any two drawbacks of octet rule.
14. (i) State the second law of thermodynamics.
    (ii) What is entropy ?
    (iii) Write how spontaneity of a chemical reaction is related with Gibb's energychange ?
15. (i) What is buffer solution ?
    (ii) Write any one example for acidic and basic buffer.
    (iii) What is common ion effect ?
16. Balance the following redox reaction by oxidation number method (Basic medium) :
    $MnO^-_{4\,(aq)} + I^-_{(aq)} \rightarrow MnO_{2(s)} + I_{2(s)}$
17. Calculate the frequency and wavelength of a photon emitted during a transition from n = 5 state to n = 2 state in the hydrogen atom.
18. Define ionisation enthalpy. How does it vary in a period and in a group? Give reasons for your answer.
19. Explain intermolecular and intramolecular hydrogen bonding with an example.
20. Discuss the hybridisation of phosphorous in PCI_5 molecule. Based on this, predict the shape and bond angles in it.

Answer all 4 questions from 21 to 24. Each carries 4 scores. **(4 × 4 = 16)**

21. (i) What is homogeneous equilibria ? Give an example for it.
    (ii) Write the relationship between K_p and K_C for the reaction $H_2 + I_2 \rightleftharpoons 2HI$.
22. (i) Write the name of any two methods for the purification of organic compounds.
    (ii) Which purification method is used to separate glycerol from spent lye ?
    (iii) What is electromeric effect ? Write two types of electromeric effect.
23. i) What are buffer solutions? Give an example each for acidic and basic buffers. (2)
    ii) What is the effect of dilution on the pH value of a buffer solution? Give reason. (1)
    iii) Explain common ion effect. (1)
24. i) Define resonance effect. (1)
    ii) Explain the two types of resonance effect with suitable examples. (2)
    iii) Which among the following is a group showing +R effect?
    -CN, -OH, NO_2, -COOH (1)