Standard: 11th Science Subject: Chemistry

Q1. 1. How does Ionic radii vary with effective nuclear charge? Give example. **3 Marks**
2. An element belongs to 3rd period and group-13 of the periodic table. Identify the element and write two properties of element.

Q2. 1. Write the general electronic configuration of Group 17 elements. **3 Marks**
2. What is the oxidation state and covalency of Al in $[AlCl(H_2O)_5]^{2+}$?
3. Which out of the following will have the most negative electron gain enthalpy and which have the least negative?
P, S, Cl and F.

Q3. 1. Name the group of the elements in which electrons are progressively filled in 4f-orbital and 5f orbitals. **3 Marks**
2. Which of the following is the correct order of size of the given species: I, I^+, I^-?
3. Which of the following elements can show covalency greater than 4?
Be, P, S, B

Q4. Account for the following:
1. Which is smaller Fe^{2+} or Fe^{3+}, why?
2. Chlorine (Cl) have more negative electron gain enthalpy than Fluorine (F).
[Atomic no.: F = 9, Cl = 17]
3. Anions are bigger in size than their parent atom.

Q5. Among the elements B, Al, C and Si:
1. Which has the highest first ionization enthalpy?
2. Which has the most negative electron gain enthalpy?
3. Which has the largest atomic radius?
Give reasons.

Q6. Select from each group of species which has the smallest radius stating the appropriate reason: **3 Marks**
1. O, O^-, O^{2-}
2. K^+, Sr^{2+}, Ar
3. Si, P, Cl

Q7. Consider the element N, P, O and S and arrange them in order of: **3 Marks**
1. Increasing first ionisation enthalpy.
2. Increasing negative electron gain enthalpy.
3. Increasing non-metallic character.

Q8. Answer the following questions: **3 Marks**
1. B, Al, Ga arrange in decreasing order of atomic radii.
2. C, F, O first electron gain enthalpy in increasing order.
3. Al forms amphoteric oxide, why?

Q9. Among the elements B, Al, C and Si: **3 Marks**
1. Which element has the highest first ionisation enthalpy?
2. Which element has the most metallic character? Justify your answer in each case.

Q10. From each set, choose the atom which has largest ionisation enthalpy and explain your answer: **3 Marks**
1. F, O, N
2. Mg, P, Ar
3. B, Al, Ga

Q11. Write four characteristic properties of p-block elements. **3 Marks**

Q12. Arrange the species in each group in order of increasing ionisation energy and give reason: **3 Marks**

1. K^+, Cl^-, Ar
2. Na, Mg, Al
3. C, N, O

Q13. Which one (atom/ ion) in the following pairs has higher electron gain enthalpy? **3 Marks**

1. O^-, S
2. O, S^-
3. O^-, S^-
4. N^-, P

Q14. **3 Marks**

1. Arrange Fe, Fe^{2+}, Fe^{3+} in increasing order of radii.
2. Explain why Be has higher ionization enthalpy than B.
3. Predict the formula of compound which might be formed by silicon and bromine.

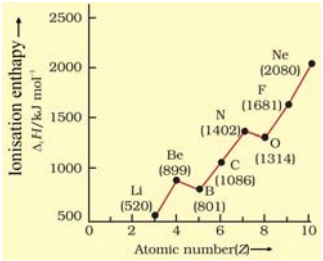
Q15. Among the elements of second period Li to Ne, pick out element:

1. With the highest first ionisation energy.
2. With highest electronegativity.
3. With largest atomic radius.
4. That is most reactive non-metal.
5. That is most reactive metal.
6. With valency equal to 4.

Q16.

1. Which orbitals are filled with electrons in third period?
2. Which of the lanthanoids is man-made element?
3. To which series do man-made elements belong?

Q17. Arrange the elements N, P, O and S in the order of:



1. Increasing first ionisation enthalpy.
2. Increasing non metallic character. Give reason for the arrangement assigned.

Q18. Arrange the following as stated.

1. Increasing order of bond dissociation energy of N_2, O_2, F_2, Cl_2.
2. Decreasing order of electropositive character of Cu, Fe, Mg.
3. Increasing order of valency of nitrogen in HNO_3, HNO_2, NO_2.

Q19. Explain the deviation in ionisation enthalpy of some elements from the general trend by using. **3 Marks**

Q20. Give the name and atomic number of the inert gas atom in which the total number of d-electrons is equal to the difference in numbers of total p and s electrons. **3 Marks**

Q21. Identify the group and valency of the element having atomic number 119. Also predict the outermost electronic configuration and write the general formula of its oxide. **3 Marks**

Q22. Out of elements of Group 17, 18, 1 in the sequence placed in modern periodic table. **3 Marks**

1. Which elements have negative electron gain enthalpy.
2. Which elements have more metallic behaviour?
3. Which elements have zero electronic behavior (zero valent)?

Q23. The amount of energy released when 1×10^{10} atoms of chlorine in vapour state are converted to Cl^- ions according to the equation, **3 Marks**

$Cl(g) + e^- \rightarrow Cl^-(g)$ is 57.86×10^{-10}J

Calculate the electron gain enthalpy of chlorine atom in terms of kJ mol^{-1} and eV per atom.

Q24. Give two similarities and one difference between Boron and Aluminium. **3 Marks**

Q25. Give reason for the following: **3 Marks**

1. Electron gain enthalpy of fluorine is less negative than that of chlorine.
2. Anionic radius is always more than that of neutral atom.
3. Ionization enthalpy of nitrogen is more than that of oxygen.

Q26. Can an element with atomic number 126, if discovered, be accommodated in the present Un set up of the long form of periodic table? **3 Marks**

Q27. What do you understand by exothermic reaction and endothermic reaction? Give one example of each type.

Q28. Give reason for the following:

1. Halogens act as good oxidising agent.
2. Electron gain enthalpy of noble gas is almost zero.
3. Na and Mg^+ have same number of electrons but removal of electron from Mg^+ requires more energy.

Q29. 1. Which pair of element show similar properties with following atomic number?

[13, 31], [11, 21]

2. Which of the following elements has most positive electron gain enthalpy?

F, N and Ne

3. Lithium shows diagonal relationship with which element and why?

Q30.

1. Out of N and O which have high first ionisation enthalpy?
2. Write general electronic configuration off-block elements.
3. Define hydrogen bonds.

Q31. Explain why the electron gain enthalpy of fluorine is less negative than that of chlorine.

Q32.

1. Consider the isoelectronic species, Na^+, Mg^{2+}, F^- and O^{2-}. What is the correct order of increasing length of their radii and why?
2. Si is semiconductor whereas 'C' is non-metal, why?

Q33. Give reasons for the following:

1. Elements in the same group have similar physical and chemical properties.
2. O has lower ionization enthalpy than N.
3. Noble gases have high positive values of electron gain enthalpies.

Q34. The radius of Na^+ cation is less than that of Na atom. Give reason.

Q35. Match the correct ionisation enthalpies and electron gain enthalpies of the following elements. **3 Marks**

	Elements		ΔH_1	ΔH_2	$\Delta_{eg}H$
(i)	Most reactive non-metal	A.	419	3051	-48
(ii)	Most reactive metal	B.	1681	3374	-328
(iii)	Least reactive element	C.	738	1451	-40
(iv)	Metal forming binary halide	D.	2372	5251	+48

Q36. Write down the outermost electronic configuration of alkali metals. How will you justify their placement in group 1 of the periodic table? **3 Marks**

Q37. All transition elements are d-block elements, but all d-block elements are not transition elements. Explain. **4 Marks**

Q38. Nitrogen has positive electron gain enthalpy whereas oxygen has negative. However, oxygen has lower ionisation enthalpy than nitrogen. Explain. **4 Marks**

Q39. How would you explain the fact that first ionisation enthalpy of sodium is lower than that of magnesium but its second ionisation enthalpy is higher than that of magnesium? **4 Marks**

Q40. First member of each group of representative elements (i.e., s and p-block elements) shows anomalous behaviour. Illustrate with two examples. **4 Marks**

Q41. Discuss the factors affecting electron gain enthalpy and the trend in its variation in the periodic table. **5 Marks**

Q42. The amount of energy released when one million of atoms of iodine in vapour state are converted to I^- ions is 4.9×10^{-13}J according to the reaction: **5 Marks**

$I(g) + e^- \rightarrow I^-(g)$

Express the electron gain enthalpy of iodine in terms of kJ mol^{-1} and eV per atom.

Q43. Discuss and compare the trend in ionisation enthalpy of the elements of group1 with those of group17 elements.

Q44. Illustrate by taking examples of transition elements and non-transition elements that oxidation states of elements are large based on electronic configuration.

Q45. p-Block elements form acidic, basic and amphoteric oxides. Explain each property by giving two examples and also write th reactions of these oxides with water.

Q46. In what manner is the long form of periodic table better than Mendeleev's periodic table? Explain with examples.

Q47. Write the drawbacks in Mendeleev's periodic table that led to its modification.

Q48. Define ionisation enthalpy. Discuss the factors affecting ionisation enthalpy of the elements and its trends in the periodic table.

Q49. Which elements have the following electronic configurations? (Use only the periodic table.)

1. $1s^2, 2s^2, 2p^5$
2. $[Ar]4s^2, 3d^{10}, 4p^1$
3. $[Xe]6s^2$
4. $[Xe]6s^2, 5d^1, 4f^7$
5. $[Ar]4s^1, 3d^{10}$ (exception to rules)

Q50. Ionisation enthalpies of elements of second period are given below:
Ionisation enthalpy/ kcal mol^{-1}, 520, 899, 801, 1086, 1402, 1314, 1681, 2080.
Match the correct enthalpy with the elements and complete the graph given in also write symbols of elements with their atomic number.