SAINIK SCHOOL GOPALGANJ
SUB: CHEMISTRY
CLASS – XI

ASSIGNMENT- 3

CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES

(Q1 – Q10) Given below are four options against each question. Choose the option which you consider the most appropriate as your answer.

Q1. Which of the following are isoelectric with one another?
(a) $K^+$and Ne (b) Na^+ and Ne
(c) Ne and O (d) $Na^+$and K^+

Q2. Which has the maximum negative electron gain enthalpy?
(a) Cl (b) Br
(c) I (d) F

Q3. In a group of the periodic table, the ionization enthalpies of the elements decrease from top to bottom because of –
(a) increase in densities (b) increase in atomic sizes
(c) decrease in chemical reactivities (d) decrease in electronegativities

Q4. An element belongs to 3rd period and group-13 of the periodic table. Which of the following properties will be shown by the element?
(a) Good conductor of the electricity (b) Liquid, metallic
(c) Gas, non- metallic (d) Solid, non- metallic

Q5. Which of the following elements can show covalency greater than 4?
(a) Be (b) P
(c) B (c) C

Q6. Among the elements of the second period the most reactive non-metal is:
(a) O (b) F (c) P (d) Si

Q7. Among alkali metals the least electronegative element is:
(a) Na (b) K (c) Rb (d) Cs

Q8. s- and p- Block elements are known as :
(a) representative elements (b) transition elements
(c) inner transition elements (d) halogens

Q9 .The elements in which electrons are progressively filled in 4f- orbital are called:
(a) actinoids (b) transition elements
(c) lanthanoids (d) halogens

Q10. Group 17 elements are known as:
(a) Halogens (b) Chalcogens
(c) Lanthanoids (d) Transition elements

Q11. Write the atomic number of the element in the third period and seventeenth group of periodic table.

Q12. On the basis of quantum numbers, justify that the sixth period of the periodic table should have 32 elements.

Q13. How do atomic radii vary in a period and in a group? How do you explain the variation?

Q14. Explain why cations are smaller and anions are larger in radii than their parent atoms?

Q15. Explain why

(i) Be has higher ionization enthalpy than B

(ii) O has lower ionization enthalpy than N and F?

Q16. How would you explain the fact that the first ionization enthalpy of sodium is lower than that of magnesium but its second ionization enthalpy is higher than that of magnesium?

Q17. What is photoelectric effect? State the result of photoelectric effect experiment that could not be explained on the basis of law of classical physics? Explain this fact on the basis of quantum theory of electromagnetic radiation?

Q18. The effect of Uncertainty principle is significant only for motion of microscopic particles and is negligible for the macroscopic particles. Justify the statement with the help of a suitable example.

Q19. Give four differences between orbit and orbital.

Q20. Calculate the total number of electrons, protons and neutrons in

(i) NH_4^+ ion and

(ii) PO_4^{3-} ions.

Q21. The kinetic energy of a sub- atomic particle is 5.85×10^{-25} J. Calculate the frequency of the particle wave.

Q22. Calculate the wave length of the radiation emitted when an electron in a hydrogen atom undergoes a transition from 4^{th} energy level to the 2^{nd} energy level. In which part of the electromagnetic spectrum does this line lie?

Q23. Calculate the number of electron which will together weigh 1 gram? Calculate the mass and charge of 1 mole of electron?

Q24. Yellow light emitted from a sodium lamp has a wavelength of 580nm. Calculate the frequency and wave number of the yellow light.

Q25. What is the number of photons of light with a wavelength of 4000 pm (picometer) that provide 1J of energy?

Q26. What is the maximum number of emission lines obtained when the excited electron of a hydrogen atom in n=6 drops to the ground state?

Q27. An element with mass number 81 contains 31.7% more neutrons as compared to protons. Assign the atomic symbol.

Q28. Write electronic configuration of all the elements having atomic number 1 to 30.
Q29. Half-filled and fully- filled orbitals are more stable than the incompletely filled orbitals. Why?

Q30. Indicate the number of unpaired electron in the elements P, Si, Cr, Fe and Mn.

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