

Class: XI  
Subject: Chemistry  
Topic: Structure of Atom  
No. of Questions: 27

Q1. The orbital configuration of Cr (24) is  $3d^5 4s^1$ . The number of unpaired electrons in  $Cr^{3+}$  is

- A. 4
- B. 2
- C. 1
- D. 3

Q2. How many quantum numbers are required to define an electron in an atom?

- A. Two
- B. Three
- C. One
- D. Four

Q3. In Schrodinger's wave equation  $\psi$  represents

- A. orbit
- B. wave function
- C. wave
- D. radial probability

Q4. What is the electronic configuration of  $Mn^{2+}$ ?

- A.  $[Ne] 3d^5 4s^0$
- B.  $[Ar] 3d^5 4s^2$
- C.  $[Ar] 3d^5 4s^0$
- D.  $[Ne] 3d^5 4s^2$

Q5. Which orbital is non-directional?

- A. s-orbital
- B. d-orbital
- C. p-orbital
- D. f-orbital

Q6.  $1.6 \times 10^{-24}$  g represents the mass of \_\_\_\_\_.

- A. proton
- B. proton or a neutron
- C. neutron
- D. proton and an electron

Q7. If atomic number of a neutral element is 20, how many electrons are present in that element?

- A. 10
- B. 20
- C. 11
- D. 15

Q8. The electronic configuration 2, 8, 8, 2 represents the element

- A. argon
- B. potassium
- C. calcium
- D. chlorine

Q9. In which of the following orbital diagrams is Aufbau principle violated?

- A. 

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↑↓	↑	
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- B. 

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↑↓	↑	↑
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- C. 

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↑	↑	↑
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- D. 

↑↓
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Q10. Which of the following atoms has the lowest valency?

- A. Oxygen
- B. Magnesium
- C. Aluminium
- D. Chlorine

Q11. Which d-orbital does not have four lobes?

- A.  $d_{x^2-y^2}$
- B.  $d_{xy}$
- C.  $d_{yz}$
- D.  $d_{z^2}$

Q12. Any p-orbital can accommodate up to

- A. ten electrons
- B. three electrons
- C. six electrons
- D. three electrons with opposite spins

Q13. When 3d orbitals are completely filled. The new electron will enter in

- A. 4s-orbital
- B. 4p-orbital
- C. 4d-orbital
- D. 3p-orbital

Q14. The mass of a neutron is of the order of

- A.  $10^{-23}$  kg
- B.  $10^{-24}$  kg
- C.  $10^{-26}$  kg
- D.  $10^{-27}$  kg

Q15. The value of Planck's constant is

- A.  $6.6256 \times 10^{-27}$  erg-sec
- B.  $66.256 \times 10^{-27}$  erg-sec
- C.  $6.02 \times 10^{-15}$  erg-sec
- D.  $3.01 \times 10^{-23}$  erg-sec

Q16. The principle quantum number 'n' describes

- A. shape of orbital
- B. subshell of electron
- C. main energy shell of electrons
- D. spin of electrons

Q17. The number of unpaired electrons in electron configuration of  $1s^2, 2s^2, 2p^5$  is

- A. 1
- B. 2
- C. 3
- D. 0

Q18. Which of the following options are not a part of atomic nucleus?

- A. Electrons
- B. Protons
- C. Neutrons
- D. Both (2) and (3)

Q19. Which of the following options is not true about anode rays?

- A. Anode rays consist of positively charged particles.
- B. Anode rays are also called canal rays.
- C. Anode rays travel in the direction of cathode rays.
- D. None of these

Q20. Which of the following electronic configurations is not possible according to Hund's rule?

- A.  $1s^2, 2s^2$
- B.  $1s^2, 2s^1$
- C.  $1s^2, 2s^2, 2p^1_x, 2p^1_y, 2p^1_z$
- D.  $1s^2, 2s^2, 2p^2_x$

Q21. Calculate the number of protons, neutrons and electrons in  $^{80}_{35}\text{Br}$

Q22. Which of the following are isoelectronic species i.e., those having the same number of electrons?  $\text{Na}^+$ ,  $\text{K}^+$ ,  $\text{Mg}^{2+}$ ,  $\text{Ca}^{2+}$ ,  $\text{S}^{2-}$ ,  $\text{Ar}$ .

Q23. The Vividh Bharati station of All India Radio, Delhi, broadcasts on a frequency of 1,368 kHz (kilo hertz). Calculate the wavelength of the electromagnetic radiation emitted by transmitter. Which part of the electromagnetic spectrum does it belong to ?

Q24. Electrons are emitted with zero velocity from a metal surface when it is exposed to radiation of wavelength  $6800 \text{ \AA}$ . Calculate threshold frequency ( $\nu_0$ ) and work function ( $W_0$ ) of the metal.

Q25. Calculate the wave number for the longest wavelength transition in the Balmer series of atomic hydrogen.

Q26. The velocity associated with a proton moving in a potential difference of 1000 V is  $4.37 \times 10^5 \text{ ms}^{-1}$ . If the hockey ball of mass 0.1 kg is moving with this velocity, Calculate the wavelength associated with this velocity.

$$\lambda = h / mv = 6.6 \times 10^{-34} / 0.1 \times 4.37 \times 10^5 = 1.51 \times 10^{-38} \text{ m}$$

Q27. If the position of the electron is measured within an accuracy of  $\pm 0.002 \text{ nm}$ , calculate the uncertainty in the momentum of the electron. Suppose the momentum of the electron is  $h/4\pi \times 0.05 \text{ nm}$ . Is there any problem in defining this value.