CLASS – XII

SUBJECT : CHEMISTRY

MONTH :

Topic- STRUCTURE OF ATOM

QUES NO	TYPE OF QUESTION (REASONING / MCQ / MATRIX / GRID / OTHER)	QUESTION	OPTION PROVIDED	CORRECT OPTION	EXPLANATION	% OF STUDENTS ATTEMPTED CORRECTLY
01	MCQ	1. The number of radial nodes for 3*p* orbital is _____.	3 4 2 1	1	for 3p orbital, the value of n is 3, and the azimuthal quantum number is 1. Therefore, the number of radial node is, $(n-l-1)=(3-1-1)$ $(n-l-1)=(3-1-1)$ =1 **So, the number of radial nodes in the 3p orbital is 1.**	
02	MCQ	2. Total number of orbitals associated with third shell will be _____	2 4 9 3	9	**Given: In the third shell ( ), there are orbital, orbitals and orbitals.**	

		_____.			**Therefore, the total number of orbitals in the third shell by using the above formula is** **Thus, the total number of orbitals associated with the third shell will be9 .**	
03	**MCQ**	**3.** Orbital angular momentum depends on _____.	**L** **Nl** **Nm** **ms**	**i**	Explanation: Orbital angular momentum depends on the value of l which is referred to as the azimuthal quantum number.	
04	**MCQ**	**4.** Chlorine exists in two isotopic forms, Cl-37 and Cl-35 but its atomic mass is 35.5. This indicates the ratio of Cl-37 and Cl-35 is approximately	1:2 1:1 1:3 3:1	**1:3**	Chlorine exists in two isotopic forms, Cl−37 and Cl−35 but its atomic mass is 35.5. This indicates the ratio of Cl−37 and Cl−35 is approximately: 1:2.	
05	**MCQ**	**5.** The pair of ions having same electronic configuration is _____.			**Electronic configuration of** Fe3+ ● Electronic configuration of Fe is $1s22s22p63s23p64s23d6$. ● Three electrons must be released for Fe3+.	

					• So, the electronic configuration of Fe3+ is $1s22s22p63s23p63d5$. **Electronic configuration of** Mn2+ • Electronic configuration of Mn is $1s22s22p63s23p64s23d5$. • Two electrons must be released for Mn2+. • So, the electronic configuration of Mn2+ is $1s22s22p63s23p63d5$. So, pair of ions having the same electronic configuration is Fe3+,Mn2+.	
06	**MCQ**	**6.** For the electrons of oxygen atom, which of the following statements is correct?	in a 2p orbital. (ii) An electror (iii) Zeff for an (iv) The two e	**iv**		
07	**R & A**	**7.** If travelling at same speeds, which of the following matter waves have the shortest wavelength?		**ii**	If travelling at the same speeds, which of the	

					following matter waves have the shortest wavelength? Explanation: According to de Broglie's equation, the alpha particles having highest mass has shortest wavelength.	
08	**R & A**	**8.** ***Assertion (A) :*** All isotopes of a given element show the same type of chemical behaviour. ***Reason (R) :*** The chemical properties of an atom are controlled by the number of electrons in the atom		**i**	**Both assertion and reason are true and reason is the correct explanantion of assertion. Isotopes have the saem atomic number i.e. same number of electrons which are responsible for their chemical behaviour. Hence, these exhibit smililar chemical properties.**	
09	**A& R**	**9.** ***Assertion (A) :*** Black body is an ideal body that emits and absorbs radiations of all frequencies. **Reason (R) :** The frequency of radiation emitted by a body goes from a lower frequency to higher frequency with an increase in temperature.	**I** **Ii** **Iii** **iv**	**ii**	**Analyzing the Assertion.** Assertion: Black body is an ideal body that emits and absorbs radiations of all frequencies The ideal body, which emits and absorbs radiation of all frequencies is called a black body and the radiation emitted by such body is called black body radiation.	

					Analyzing the reason Reason: The frequency of radiation emitted by a body goes from a lower frequency to higher frequency with an increase in temperature. The frequency distribution of the emitted radiation from a black body depends only on its temperature. Frequency of radiations emitted is directly proportional to the temperature Thus, at lower temperature, frequency is low and as temperature increases the emitted frequency also increases. Hence, the frequency of radiation emitted by a body goes from a lower frequency to higher frequency with an increase in temperature. But, this doesn't explain why black body emit and absorb radiation of all frequencies. Hence, the given assertion statement is true and the given reason is also true but the reason is not the explanation of assertion Hence the correct answer is option (B)	

10	**A& R**	**10.** ***Assertion (A) :*** It is impossible to determine the exact position and exact momentum of an electron simultaneously. ***Reason (R) :*** The path of an electron in an atom is clearly defined.	**I** **Ii** **Iii** **iv**	**iii**	Assertion is true and reason is false. As per Heisenberg. s uncertainty principle, the exact position and exact momentum of an electron cannot be determined simultaneously. So, the path of electron in an atom is not clearly defined.	