DAILY PRACTICE PROBLEM OF PHYSICAL CHEMISTRY FOR NEET

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ATOMIC STRUCTURE



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			DPP-1			
1.	The ratio of specific	charge of an electron to tha	t of a proton is			
	(1) 1:1	(2) 1837 : 1	(3)1:1837	(4)2:1		
Ans.	(2)					
2.	Atomic number and reutrons in M ²⁺ ion	mass number of an element l are respectively	M are 25 and 52 respectively	7. The number of electrons, protons and		
	(1) 25, 25 and 27	(2) 25, 27 and 25	(3) 27, 25 and 27	(4) 23, 25 and 27		
Ans.	(4)					
3.	The number of photo	ons of light of wavelength 7	000 Å equivalent to 1 J are			
	$(1) 3.52 \times 10^{-18}$	$(2) 3.52 \times 10^{18}$	(3) 50, 000	(4) 10,000		
Ans.	(2)					
4.	The frequency of a w	vave is $6 \times 10^{15} \text{ s}^{-1}$. Its wave	number would be			
	$(1) 10^5 \mathrm{cm}^{-1}$	$(2) 2 \times 10^7 m^{-1}$	(3) $2 \times 10^7 \mathrm{cm}^{-1}$	$(4) 2 \times 10^5 \mathrm{m}^{-1}$		
Ans.	(2)					
5.	If threshold wavelength (λ°) for ejection of electron from metal is 330 nm, then work function for the photoe emission is					
	(1) $6 \times 10^{-10} \mathrm{J}$	(2) 1.2×10^{-18} J	(3) 3×10^{-19} J	(4) $6 \times 10^{-19} \mathrm{J}$		
Ans.	(4)					
6.	A certain metal when irradiated with light ($v = 3.2 \times 10^{16}$ Hz) emits photo electrons with twice kinetic energy photo electrons when the same metal is irradiated by light ($v = 2.0 \times 10^{16}$ Hz). Calculate v_0 of electron					
	(1) 1.2×10^{14} Hz	(2) $8 \times 10^{15} \text{Hz}$	(3) $1.2 \times 10^{16} \text{Hz}$	$(4) 4 \times 10^{12} \text{Hz}$		
Ans.	(2)					
7.	In an atom $_{13}$ Al ²⁷ . nu	mber of protons is (a) electro	on is (b) and neutron is (c).	Hence ratio will be [in order c : b : a]		
	(1) 13 : 14 : 13	(2) 13 : 13 : 14	(3) 14 : 13 : 13	(4) 14 : 13 : 14		
Ans.	(3)					
8.	 Which of the following statements concerning the two isotopes 13Al²⁷ and 14Si²⁷ are not incorrect :- (1) The aluminium isotope has more neutrons per atom than the silicon isotope (2) If 13Al²⁷ absorbs neutron, silicon isotope is formed (3) Both the isotopes have a atomic number 27 (4) Both the isotopes contain 27 electrons per atom 					
Ans.	(1)					
9.	An isotone of ₃₂ Ge ⁷	⁷⁶ is :-				
	(i) $_{32}Ge^{77}$	(ii) ₃₃ As ⁷⁷	(iii) ₃₄ Se ⁷⁷	(iv) ₃₄ Se ⁷⁸		
	(1)(ii) & (iii)	(2) (i) & (ii)	(3) (ii) & (iv)	(4) (ii) & (iii) & (iv)		
Ans.	(3)					

DPP-2 1. According to Bohr's theory angular momentum of an electron in 6th orbit is (1) $2.5\frac{h}{\pi}$ (2) $6\frac{h}{\pi}$ (3) $3\frac{h}{\pi}$ (4) $\frac{2.5h}{2\pi}$ (3) Ans. 2. If r, is the radius of the first orbit of hydrogen atom, then the radii of second, third and fourth orbits in term of r, are $(1) r_1^2, r_1^3, r_1^4$ $(2)4r_1,9r_1,16r_1$ $(3)8r_1,27r_1,64r_1$ $(4) 2r_1, 6r_1, 8r_1$ (2) Ans. 3. Electronic energy is negative because (1) Electron has negative charge (2) Energy is zero near the nucleus and decreases as the distance from nucleus increases (3) Energy is zero at infinite distance from the nucleus and decreases as the electron comes towards nucleus (4) There are interelectronic repulsions Ans. (3) 4. If the energy difference between the ground state and excited state of an atom is 4.4×10^{-19} J. The wavelength of photon required to produce this transition is $(3)45 \times 10^{-7}$ Å $(4) 4.4 \times 10^{-7} \,\mathrm{cm}$ $(1)4.5 \times 10^{-7} \,\mathrm{m}$ $(2)4.5 \times 10^{-7} \,\mathrm{nm}$ Ans. (1) 5. The threshold energy is given as E₀ and radiation of energy E falls on metal, then K.E. is given as (4) $\frac{E}{E_0}$ $(1) \frac{\mathrm{E} - \mathrm{E}_0}{2}$ $(2) E - E_0$ $(3) E_0 - E$ Ans. (2) $E_n = -313.6/n^2$ kcal/mole. If the value of E = -34.84 kcal/mole, to which value does 'n' correspond? 6. (1)4(2)3(3)2(4)1(2) Ans. Which transition of Li^{2+} is associated with same energy change as n = 6 to n = 4 transition in He⁺? 7. (1) n = 3 to n = 1(2) n = 8 to n = 6(3) n = 9 to n = 6(4) n = 2 to n = 1Ans. (3) 8. Zeeman effect refers to the (1) Splitting of the spectral lines in a magnetic field (2) Splitting of the spectral lines in an electrostatic field (3) Emission of electrons from metals when light falls on it (4) Random scattering of α -particles by gold foil Ans. (1)

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9.	Number of spectral	l lines in Balmer series when	n an electron return from 7 ^t	^h orbit to 1 st orbit of hydrogen atom are
	(1)5	(2)6	(3)21	(4) 15
Ans.	(1)			
10.	The number of way	ves in the third orbit of H ato	om is	
	(1)1	(2)2	(3)4	(4)3
Ans.	(4)			
11.	Which of the follo	wing electronic level would	allow to hydrogen to abso	rb a photon but not emit a photon ?
	(1) 3s	(2) 2p	(3)2s	(4) 1 s
Ans.	(4)			
12.	Which of the follow	ving transition will emit may	ximum energy in hydrogen	atom ?
	(1) $4f \rightarrow 2s$	$(2) 4d {\rightarrow} 2p$	$(3) 4p \rightarrow 2s$	(4) All have same energy
Ans.	(4)			
13.	The radius of a she	ll for H-atom is 4.761 Å. Th	e value of n is :-	
	(1)3	(2)9	(3)5	(4)4
Ans.	(1)			

DPP-3 1. The ratio of the radii of two Bohr orbits of H-atoms is 4 : 1, what would be their nomenclature :-(1)K&L (2) L & K (3) N & L (4) 2 & 3 both (4) Ans. 2. The energy of H-atom in nth orbit is E_n then energy in nth orbit of singly ionised helium atom will be $(2) E_{n}/4$ $(3)2E_{n}$ $(4) E_{n}/2$ (1)4E (1) Ans. 3. Going from K-shell to N-shell in case of H-atom :-(1) Kinetic energy decreases (2) Total energy decreases (3) Potential energy decreases (4) None of these Ans. (1) 4. The radiation of low frequency will be emitted in which transition of hydrogen atom :-(2) n = 2 to n = 5(1) n = 1 to n = 4(3) n = 3 to n = 1(4) n = 5 to n = 2Ans. (4) 5. Energy required to remove an e⁻ from M shell of H-atom is 1.51 eV, then energy of first excited state will be :-(1)-1.51 eV(2)+1.51 $(3) - 3.4 \,\mathrm{eV}$ $(4) - 13.6 \, eV$ (3) Ans. 6. Which series have highest energy in hydrogen spectrum :-(2) Bracket (1) Balmer (3) Pfund (5) Lyman Ans. (4) 7. The ratio of minimum wavelengths of Lyman & Balmer series will be :-(1)1.25(2)0.25(3)5(4)10Ans. (2) 8. What transition in He⁺ will have the same λ as the line I line in series of H - atom $(1) 5 \rightarrow 3$ $(2) 3 \rightarrow 2$ $(3) 6 \rightarrow 4$ (4) 4 \rightarrow 2 (4) Ans. $\frac{h}{2\pi}$ is angular momentum is orbit of He⁺ 9. (1) First (2) Second (3) Third (4) Infinite (1) Ans. 10. Electronic energy of hydrogen atom depends on the quantum number : (1) n, 1 and m (2) n and l only (3) n and m only (4) n only

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(4)

Ans.

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quantum number of the excited state is : (1) 1 (2) 3 (3) 4 (4) ∞ Ans. (3) 12. What will be the longest wavelength line in Balmer series of spectrum of H-atom ? (1) 546 nm (2) 656 nm (3) 566 nm (4) 556 nm Ans. (2)	11.	A photon of energ	y 12.75 eV is completely a	bsorbed by a hydrogen ator	n initially in ground state. The princip
(1)1 (2)3 (3)4 (4)∞ Ans. (3) 12. What will be the longest wavelength line in Balmer series of spectrum of H-atom ? (1)546 nm (2)656 nm (3)566 nm (4)556 nm Ans. (2)		quantum number o	of the excited state is :		
Ans. (3) 12. What will be the longest wavelength line in Balmer series of spectrum of H-atom ? (1) 546 nm (2) 656 nm (3) 566 nm (4) 556 nm Ans. (2)		(1)1	(2)3	(3)4	$(4)\infty$
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Ans. (2)		(1)546 nm	(2)656 nm	(3) 566 nm	(4) 556 nm
	Ans.	(2)			

DPP-4

1.	If kinetic energy of a proton is increased nine times, the wavelength of the de-Broglie wave associated with it would become			glie wave associated with it would	
	(1) 3 times	(2)9 times	(3) $\frac{1}{3}$ times	(4) $\frac{1}{9}$ times	
Ans.	(3)				
2.	The de-Broglie wavelengt	h of an electron travelling	with 10% of velocity of light	t is equal to	
	(1)242.4 pm	(2) 24.2 pm	(3) 2.42 pm	(4) 0.2424 pm	
Ans.	(2)				
3.	The momentum of a partic	ele which has a de-Broglie w	vavelength of 0.1 nm is		
	(1) $3.2 \times 10^{-24} \text{kg ms}^{-1}$	(2) $4.3 \times 10^{-22} \text{ kg ms}^{-1}$	(3) $5.3 \times 10^{-22} \text{ kg ms}^{-1}$	(4) $6.62 \times 10^{-24} \text{ kg ms}^{-1}$	
Ans.	(4)				
4.	The uncertainty in veloci approximately	ty of an electron present i	n the nucleus of diameter	10 ⁻¹⁵ m hypothetically should be	
	(1) 10^{-11} m/s	(2) 10^8 m/s	(3) 10 ¹¹ m/s	(4) 10 Å/s	
Ans.	(3)				
5.	Assuming the velocity to would be maximum?	be same, the wavelength o	f the waves associated with	which of the following particles	
	(1) An electron	(2) A proton	(3) An α -particle	(4) A deutron	
Ans.	(1)				
6.	If the uncertainty in the position of electron is zero, the uncertainty in its momentum would be				
	(1) Zero	(2) Greater than $\frac{h}{4\pi}$	(3) Less than $\frac{h}{4\pi}$	(4) Infinity	
Ans.	(4)				
7.	Which of the following ha	s least de-Broglie λ ?			
	(1) e [_]	(2) p	(3) CO ₂	$(4) SO_2$	
Ans.	(4)				

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	DPP-5			
1.	The set of quantum numb	pers not applicable to an ele	ctron	
	$(1)1,1,1,+\frac{1}{2}$	$(2)1,0,0,+\frac{1}{2}$	(3) 1,0,0,- $\frac{1}{2}$	(4) 2,0,0, + $\frac{1}{2}$
Ans.	(1)			
2.	The principal and azimuth	nal quantum number of elect	trons in 4f orbitals are	
A	(1)4,2	(2)4,4	(3)4,3	(4) 3, 4
Ans.	(3)			
3.	How many 3d electrons ca	an have spin quantum num	ber $-\frac{1}{2}$?	
	(1)5	(2)7	(3)8	(4) 10
Ans.	(1)			
4	The correct order of incr	easing energy of atomic or	nital is	
	(1) $5p < 4f < 6s < 5d$	(2) $5p < 6s < 4f < 5d$	(3) $4f < 5p < 5d < 6s$	(4) $5p < 5d < 4f < 6s$
Ans.	(2)			
5	Which shell would be the	first to have 'g' sub shell ?		
3.	(1)L	(2) M	(3) N	(4) O
Ans.	(4)			
6.	For which one of the follo	owing set of quantum numb	ers an electron will have the	e highest energy ?
	1	1	1	1
	(1) 3,2,1, $\frac{1}{2}$	$(2)4,2,-1,\frac{1}{2}$	$(3)4, 1, 0, -\frac{1}{2}$	$(4)5, 0, 0, -\frac{1}{2}$
Ans.	(2)			
7.	The energies of orbitals of	f H-atom are in the order		
	(1) $3s < 3p < 4s < 3d < 4p$		(2) $3s < 3p < 3d < 4s < 4p$	
	(3) 3s = 3p = 3d < 4s = 4p		(4) 3s = 3p = 3d < 4s < 4p	
Ans.	(3)			
8.	Which of the following se	et of quantum number is po	ssible ?	
	(1) n = 4, l = 2, m = -2, s =	-2	(2) $n = 4, l = 4, m = 0, s = \frac{1}{2}$	$\frac{1}{2}$
	(3) n = 4, 1 = 3, m = -3, s =	$\frac{1}{2}$	(4) n = 4, l = 0, m = 0, s = 0	

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9.	The maximum nu	mber of electrons in an atom	m which can have $n = 4$ is				
	(1)4	(2)8	(3) 16	(4) 32			
Ans.	(4)						
10.	In the presence of is	magnetic field, the possible	enumber of orientations for a	an orbital of azimuthal quantum numb	ber 3,		
	(1) Three	(2) One	(3) Five	(4) Seven			
Ans.	(4)						
11.	In an atom, which magnetic quantum	h has 2K, 8L, 18M and 2N number, $m = 0$ is	l electrons in the ground st	ate. The total number of electrons ha	ving		
	(1) 6	(2) 10	(3)7	(4) 14			
Ans.	(4)						
12.	The probability d	ensity curve for 2s electror	appears like				
	$(1)^{R^2}$			r →			
Ans.	(3) R ²		(4)				
12	The number of re	dial radaa in 4a and 2n arb					
13.	$(1)^2 0$	(2) 3 1	(3) 2 2	(4) 3 2			
Ans.	(1) 2, 0	(2)3,1	(3)2,2	(7) 5, 2			
14.	Which of the follo	Which of the following orbital with the four lobes present on the axis ?					
	(1) d_{z^2}	(2) d_{xv}	$(3) d_{vz}$	(4) $d_{x^2-y^2}$			
Ans.	(4)						

- 15. Which of the following statement concerning the four quantum number is incorrect?
 - (1) n gives the size of an orbital
 - (2) l gives the shape of an orbital
 - (3) m gives the energy of the electron in orbital
 - (4) s gives the direction of spin of electron in the orbital
- Ans. (3)
- **16.** Two electrons in K shell will not have
 - (1) Same principal quantum number
 - (2) Same azimuthal quantum number
 - (3) Same magnetic quantum number
 - (4) Same spin quantum number
- Ans. (4)

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Ans.

DPP - 6

(2) $1s^2$, $2s^1$, $2p_x^{-1}$, $2p_y^{-1}$, $2p_z^{-1}$

(4) $1s^2$, $2s^2$, $2p^6$, $3s^2$, $3p_x^{-1}$, $3p_y^{-1}$, $3p_z^{-1}$

1. The orbital diagram in which both Pauli's exclusion principle and Hund's rule are violated is



3. How many quantum numbers are required to specify the position of electron :-

	(1)1	(2) 2	(3) 3	(4) 4
Ans.	(4)			

4.	If $n = 3$, then	n which valu	ue of ' ℓ ' is	correct :
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(1)0	(2)1	(3)2	(4) All of them
Ans. (4	4)			
5. If	$\ell \ell = 3$ then type and	number of orbital is :-		

(1)3p, 3 (2) 4f, 14 (3) 5f, 7 (4) 3d, 5 (3) Ans.

6.	The total value of m	for the electrons $(n = 4)$ is -		
	(1)4	(2)8	(3) 16	(4) 32
Ans.	(3)			
7.	An orbital with $\ell =$	0 is symmetrical about the	e :-	
	(1) x-axis only	(2) y-axis only	(3) z-axis only	(4) The nucleus

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8.	The basis of three u	npaired electrons present	in the configuration of nitr	ogen is :	
	(1) Aufbau principle	2	(2) Pauli's principl	e	
	(3) Hund's principle		(4) Uncertainity pr	inciple	
Ans.	(3)				
9.	An atom of Cr [Z =	24] loses 2 electrons. Ho	w many unpaired electron	as shall be there in Cr ⁺² :	
	(1)4	(2) 3	(3) 2	(4) 1	
Ans.	(1)				
10.	No. of all subshells	s of $n + 1 = 7$ is:-			
	(1)4	(2)5	(3)6	(4) 7	
Ans.	(1)				
11.	Which represents t	he correct pattern of elec	tron filling in Cr :-		
	$(1) \uparrow \downarrow \uparrow \downarrow \uparrow $	\uparrow	$(2) \uparrow \uparrow \uparrow \uparrow$		
	$(3) \uparrow \uparrow \uparrow \uparrow \uparrow$	$\uparrow \qquad \uparrow$	$(4) \uparrow \downarrow \uparrow \uparrow \uparrow$	\square	
Ans.	(3)				
12.	Which element con	tain non spherical electron	n density :-		
	(1) He	(2) B	(3)Be	(4)Li	
Ans.	(2)				
13.	A transition elemen	t X has a configuration (A	r)3d ⁴ in its +3 oxidation sta	te. Its atomic number is	
	(1)22	(2) 19	(3) 25	(4) 26	
Ans.	(3)				
14.	Any f-orbital can ac	commodate upto			
	(1) 2 electrons with	n parallel spin			
	(2) 6 electrons				
	(3) 2 electrons with opposite spin				
	(4) 14 electrons				
Ans.	(3)				
15.	In the ground state,	an element has 13 electro	ns in its M-shell. The elem	ent is	
Ans.	(1) Manganese (1)	(2) Cobalt	(3) Nickel	(4) Iron	
16.	In any sub-shell, th	ne maximum number of e	electrons having same valu	e of spin quantum number is	
	(1) $\sqrt{l(l+1)}$	(2) $l + 2$	(3) 2l + 1	(4) 4l + 2	
Ans.	(3)				