Q1: 16 March (Shift 1) - Numerical

When light of wavelength 248nm falls on a

metal of threshold energy 3.0eV, the de-Broglie wavelength of emitted electrons is____ $\AA$.
(Round off to the Nearest Integer).

[Use: $\sqrt{3}=1.73,\ \mathrm{h}=6.63\times10^{-34}\ \mathrm{J_S}$

$\mathrm{m_e}=9.1\times10^{-31}\ \mathrm{kg};\mathrm{c}=3.0\times10^{8}\ \mathrm{ms^{-1}}$

$\mathrm{leV}=1.6\times10^{-19}\ \mathrm{J}$]

Q2: 16 March (Shift 2) - Single Correct

Arrange the following metal complex/ compounds in the increasing order of spin only magnetic moment.

Presume all the three, high spin system. (Atomic numbers $\mathrm{Ce}=58, \mathrm{Gd}=64$ and $\mathrm{Eu}=63$.)

(a) $(\mathrm{NH_4})_2\left[\mathrm{Ce(NO_3)_6}\right]$

(b) $\mathrm{Gd(NO_3)_3}$ and

(c) $\mathrm{Eu(NO_3)_3}$

Answer is:

(1) $(\mathrm{b})<(a)<(c)$

(2) $(\mathrm{c})<(a)<(b)$

(3) $(a)<(b)<(c)$

(4) $(a)<(c)<(b)$

Q3: 16 March (Shift 2) - Numerical

The number of orbitals with $\mathrm{n}=5,\ \mathrm{m_l}=+2$ is ___
(Round off to the Nearest Integer).

Q4: 17 March (Shift 1) - Single Correct

What is the spin-only magnetic moment value (BM) of a divalent metal ion with atomic number 25, in it's

aqueous solution?

(1) 5.92

(2) 5

(3) zero

(4) 5.26

Q5: 17 March (Shift 1) - Numerical

A certain orbital has $n = 4$ and $m_L = -3$. The number of radial nodes in this orbital is ____ (Round off to the Nearest Integer).

Q6: 17 March (Shift 2) - Numerical

In the ground state of atomic $Fe(Z = 26)$, the spin-only magnetic moment is ____ $\times 10^{-1}$BM. (Round off to the Nearest Integer).
[Given : $\sqrt{3} = 1.73, \sqrt{2} = 1.41$]

Q7: 18 March (Shift 1) - Single Correct

A certain orbital has no angular nodes and two radial nodes. The orbital is:

(1) 2 s

(2) 3 s

(3) 3p

(4) 2p

Q8: 18 March (Shift 2) - Single Correct

Given below are two statements:

Statement I : Bohr's theory accounts for the stability and line spectrum of Li^+ ion.

Statement II : Bohr's theory was unable to explain the splitting of spectral

lines in the presence of a

magnetic field. In the light of the above statements, choose the

most appropriate answer from the options given below:

(1) Both statement I and statement II are true.

(2) Statement I is false but statement II is true.

(3) Both statement I and statement II are false.

(4) Statement I is true but statement II is false.

Answer Key

Q1 (9)	**Q2** (4)	**Q3** (3)	**Q4** (1)
Q5 (0)	**Q6** (49)	**Q7** (2)	**Q8** (2)