

NEET D- AND F-BLOCK ELEMENTS — LANTHANIDS: ELECTRONIC CONFIGURATION, ATOMIC AND IONIC SIZES — PYQS

Max. Marks: 52

Questions: 13

Section A (MCQ) — 13 questions

Q.1 The lanthanide ion having four unpaired electrons is
(Given : Atomic numbers of Ce = 58, Nd = 60, Tb = 65 and Ho = 67) [RE-NEET (UG) 2026]

- (1) Ho^{3+} (2) Nd^{3+} (3) Ce^{3+} (4) Tb^{3+}

Scan or tap for the full solution



Q.2 The pair of lanthanoid ions which are diamagnetic is [NEET (UG) 2024]

- (1) Ce^{4+} and Yb^{2+} (2) Ce^{3+} and Eu^{2+}
(3) Gd^{3+} and Eu^{3+} (4) Pm^{3+} and Sm^{3+}

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Q.3 Zr (Z = 40) and Hf (Z = 72) have similar atomic and ionic radii because of : [NEET (UG) 2021]

- (1) Having similar chemical properties
(2) Belonging to same group
(3) Diagonal relationship
(4) Lanthanoid contraction

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Q.4 The electronic configuration of Eu (Atomic No. 63), Gd (Atomic No. 64) and Tb (Atomic No. 65) are [NEET 2016 (Phase 1)]

- (1) $[\text{Xe}]4f^6 5d^1 6s^2$, $[\text{Xe}]4f^7 5d^1 6s^2$ and $[\text{Xe}]4f^8 5d^1 6s^2$
(2) $[\text{Xe}]4f^7 6s^2$, $[\text{Xe}]4f^7 5d^1 6s^2$ and $[\text{Xe}]4f^9 6s^2$
(3) $[\text{Xe}]4f^7 6s^2$, $[\text{Xe}]4f^8 6s^2$ and $[\text{Xe}]4f^8 5d^1 6s^2$
(4) $[\text{Xe}]4f^6 5d^1 6s^2$, $[\text{Xe}]4f^7 5d^1 6s^2$ and $[\text{Xe}]4f^9 6s^2$

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Q.5 Gadolinium belongs to 4f series. Its atomic number is 64. Which of the following is the correct electronic configuration of gadolinium? [AIPMT 2015]

- (1) $[\text{Xe}]4f^9 5s^1$ (2) $[\text{Xe}]4f^7 5d^1 6s^2$
(3) $[\text{Xe}]4f^6 5d^2 6s^2$ (4) $[\text{Xe}]4f^8 6d^2$

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Q.6 Reason of lanthanoid contraction is [AIPMT 2014]

- (1) negligible screening effect of 'f'-orbitals
(2) increasing nuclear charge
(3) decreasing nuclear charge
(4) decreasing screening effect.

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Q.7 Which of the following lanthanoid ions is diamagnetic?

(At. nos. Ce = 58, Sm = 62, Eu = 63, Yb = 70)

[NEET 2013]

- (1) Eu^{2+} (2) Yb^{2+} (3) Ce^{2+} (4) Sm^{2+}

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Q.8 The outer electronic configuration of Gd (At. No. 64) is [NEET 2013 (Karnataka)]

- (1) $4f^5 5d^4 6s^1$ (2) $4f^7 5d^1 6s^2$
(3) $4f^3 5d^5 6s^2$ (4) $4f^4 5d^5 6s^1$

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Q.9 Identify the incorrect statement among the following: [AIPMT 2007]

- (1) Lanthanoid contraction is the accumulation of successive shrinkages.
(2) As a result of lanthanoid contraction, the properties of 4d series of the transition elements have no similarities with the 5d series of elements.
(3) Shielding power of 4f electrons is quite weak.
(4) There is a decrease in the radii of the atoms or ions as one proceeds from La to Lu.

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Q.10 Lanthanoids are [AIPMT 2004]

- (1) 14 elements in the sixth period (atomic no. 90 to 103) that are filling 4f sublevel
- (2) 14 elements in the seventh period (atomic number = 90 to 103) that are filling 5f sublevel
- (3) 14 elements in the sixth period (atomic number = 58 to 71) that are filling the 4f sublevel
- (4) 14 elements in the seventh period (atomic number = 50 to 71) that are filling 4f sublevel.

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Q.11 The correct order of ionic radii of Y^{3+} , La^{3+} , Eu^{3+} and Lu^{3+} is

(Atomic nos. Y = 39, La = 57, Eu = 63, Lu = 71)

[AIPMT 2003]

- (1) $\text{Y}^{3+} < \text{La}^{3+} < \text{Eu}^{3+} < \text{Lu}^{3+}$
- (2) $\text{Y}^{3+} < \text{Lu}^{3+} < \text{Eu}^{3+} < \text{La}^{3+}$
- (3) $\text{Lu}^{3+} < \text{Eu}^{3+} < \text{La}^{3+} < \text{Y}^{3+}$
- (4) $\text{La}^{3+} < \text{Eu}^{3+} < \text{Lu}^{3+} < \text{Y}^{3+}$

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Q.12 General electronic configuration of lanthanides is

[AIPMT 2002]

- (1) $(n-2)f^{1-14} (n-1)s^2 p^6 d^{0-1} ns^2$
- (2) $(n-2)f^{0-14} (n-1)d^{0-1} ns^2$
- (3) $(n-2)f^{0-14} (n-1)d^{10} ns^2$
- (4) $(n-2)d^{0-1} (n-1)f^{1-14} ns^2$

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Q.13 Which of the following statements is **not** correct?

[AIPMT 2001]

- (1) $\text{La}(\text{OH})_3$ is less basic than $\text{Lu}(\text{OH})_3$.
- (2) In lanthanide series ionic radius of Ln^{3+} ion decreases.
- (3) La is actually an element of transition series rather than lanthanides.
- (4) Atomic radii of Zr and Hf are nearly the same because of lanthanide contraction.

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ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	1	1	4	2	2	1	2	2	2	3	2
Ques.	12	13									
Ans.	1	1									