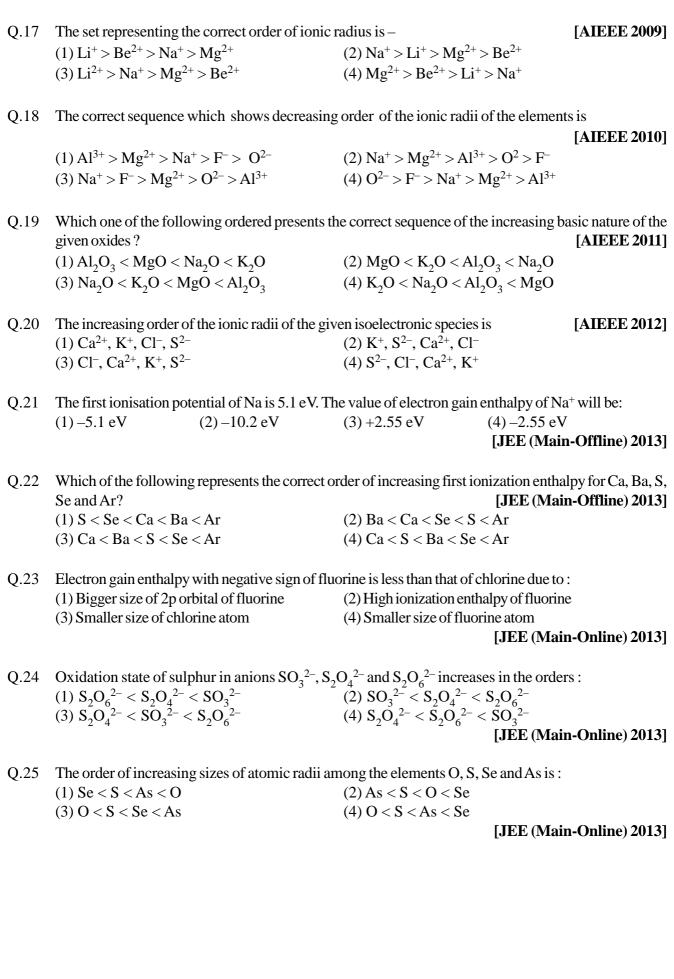
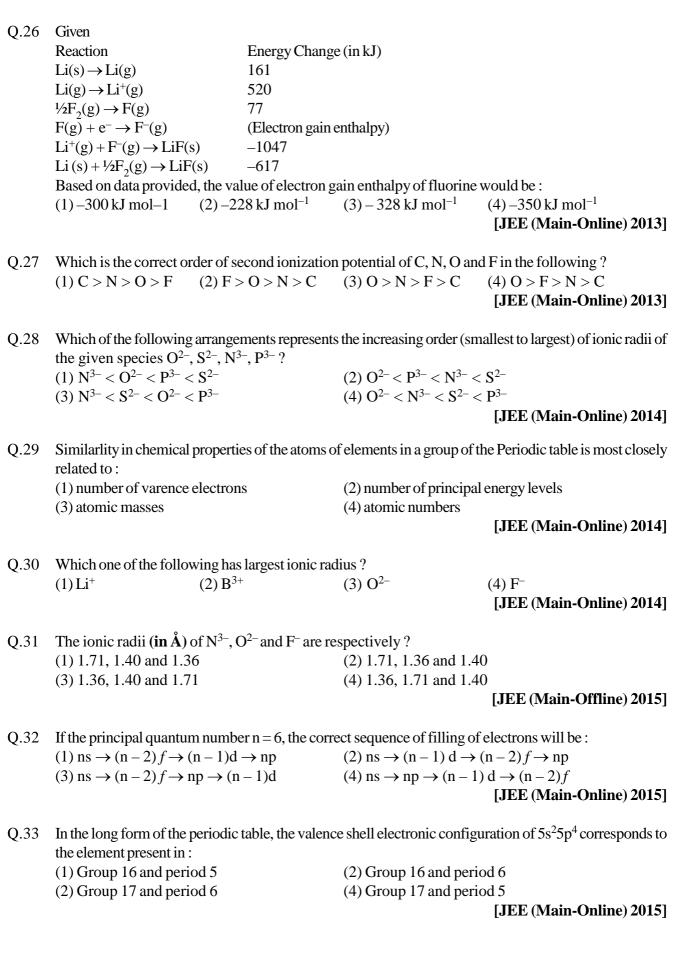
## **CLASSIFICATION OF ELEMENTS & PERIODIC PROPERTIES**

## [JEE MAIN]

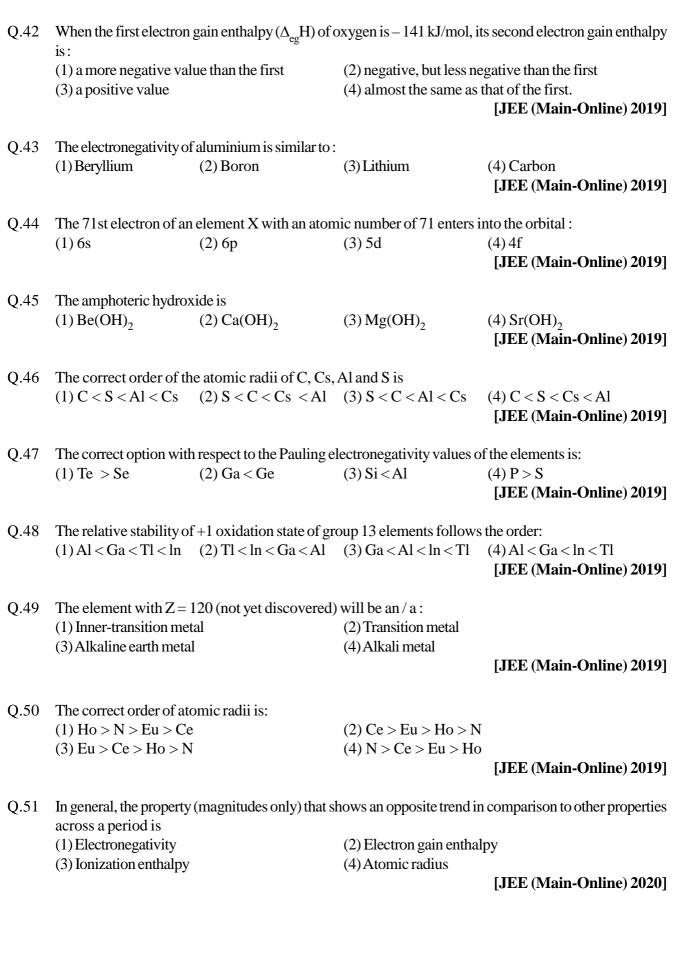
Q.1	The correct order of a	[AIEEE 2002]					
	(1) Ce > Sm > Tb > I	Lu	(2) $Lu > Tb > Sm > C$	Ce			
	(3) Tb > Lu > Sm > 0	Ce	(4) Sm > Tb > Lu > C	Ce			
Q.2	Ce <sup>3+</sup> , La <sup>3+</sup> , Pm <sup>3+</sup> and	Ce <sup>3+</sup> , La <sup>3+</sup> , Pm <sup>3+</sup> and Yb <sup>3+</sup> have ionic radii in the increasing order as –					
	(1) $La^{3+} < Ce^{3+} < Pm$	$a^{3+} < Yb^{3+}$	(2) $Yb^{3+} < Pm^{3+} < Ce^{-1}$				
	(3) $La^{3+} = Ce^{3+} < Pm$	$a^{3+} < Yb^{3+}$		(4) $Yb^{3+} < Pm^{3+} < La^{3+} < Ce^{3+}$			
Q.3	According to the Perio	related to their? [AIEEE 2003]					
	(1) Nuclear masses		(2) Atomic numbers				
	(3) Nuclear neutron-p	roton number ratio	(4) Atomic masses				
	. ,		` ,				
Q.4	The reduction in atom	nents of - [AIEEE 2003					
	(1) d-block	(2) f-block	(3) Radioactive series	(4) High ator			
Q.5	Which one of the followard (At. no. $Cs = 55$ , $Br = 55$ )	[AIEEE 2003]					
	(1) N <sup>3-</sup> , F <sup>-</sup> , Na <sup>+</sup>	(2) Be, $Al^{3+}$ , $Cl^{-}$	$(3) Ca^{2+}, Cs^+, Br$	(4) Na <sup>+</sup> , Ca <sup>2</sup>	$^{2+}$ , $Mg^{2+}$		
Q.6	The atomic numbers of 24, 25 and 26. Which	,					
	(1) Cr	(2) Mn	(3) Fe	(4) V			
Q.7	Which one of the follo	ties ? [AIEEE 2004]					
	(1) K <sup>+</sup> , Cl <sup>-</sup> , Mg <sup>2+</sup> , So (3) K <sup>+</sup> , Ca <sup>2+</sup> , Sc <sup>3+</sup> , C		(2) Na <sup>+</sup> , Ca <sup>2+</sup> , Sc <sup>3+</sup> , (4) Na <sup>+</sup> , Mg <sup>2+</sup> , Al <sup>3+</sup> , (6)				
Q.8	Which one of the follo $(1) O^{2-}$	owing ions has the higher $(2) B^{3+}$	st value of ionic radius?	(4) F <sup>-</sup>	[AIEEE 2004]		
	<b>\</b> / -	` '	` '	` /			

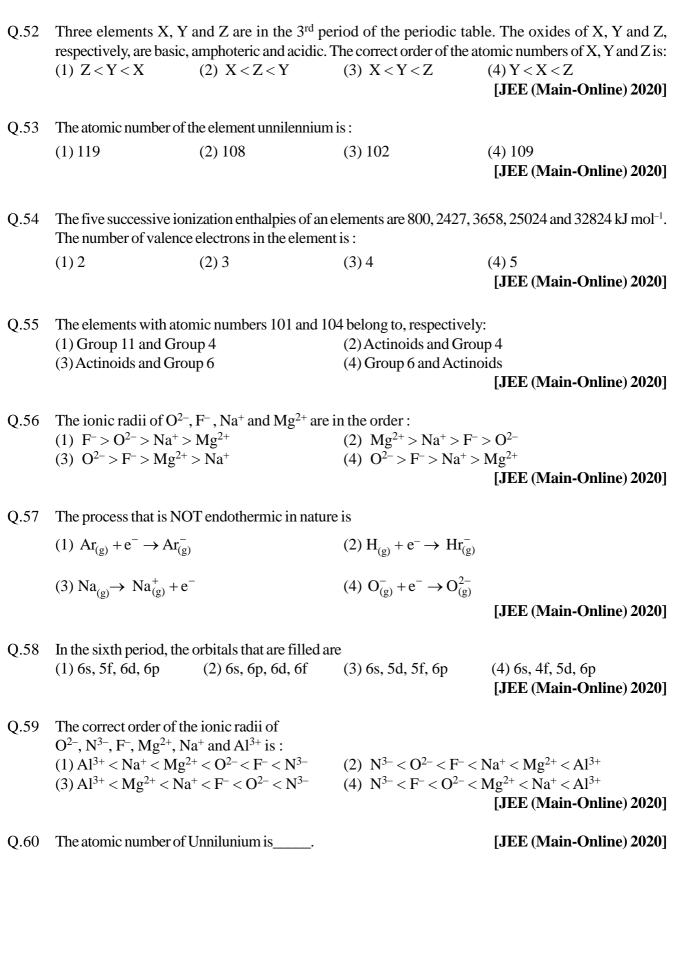
Among Al<sub>2</sub>O<sub>3</sub>, SiO<sub>2</sub>, P<sub>2</sub>O<sub>3</sub> and SO<sub>2</sub> the correct order of acidic strength is: [AIEEE 2004] Q.9  $(1) Al_2O_3 < SiO_2 < SO_2 < P_2O_3$  $(2) SiO_2 < SO_2 < Al_2O_3 < P_2O_3$  $(3) SO_2 < P_2O_3 < SiO_2 < Al_2O_3$  $(4) Al_2O_3 < SiO_2 < P_2O_3 < SO_2$ The formation of the oxide ion  $O_{(g)}^{2-}$  requires first an exothermic and then an endothermic step as shown Q.10 below. [AIEEE 2004] 
$$\begin{split} O_{(g)} + e^- &= O^-_{(g)} \; \Delta H^\circ = - \; 142 \; kJ \; mol^{-1} \\ O^-_{(g)} + e^- &= O^{2-}_{(g)} \; \Delta H^\circ = 844 \; kJ \; mol^{-1} \end{split}$$
This is because of: (1) O<sup>-</sup>ion will tend to resist the addition of another electron (2) Oxygen has high electron affinity (3) Oxygen is more electronegative (4) O<sup>-</sup>ion has comparatively larger size than oxygen atom In which of the following arrangements the order is NOT according to the property indicated against it? Q.11 (1)  $Al^{3+} < Mg^{2+} < Na < F^-$  increasing ionic size [AIEEE 2005] (2) B < C < N < O – increasing first ionization enthalpy (3) I < Br < F < Cl – increasing electron gain enthalpy (with negative sign) (4) Li < Na < K < Rb - increasing metallic radius Which of the following oxides is amphoteric in character? Q.12 [AIEEE 2005] (1) SnO<sub>2</sub>(2) SiO<sub>2</sub>(3) CO<sub>2</sub>(4) CaO The lanthanide contraction is responsible for the fact that [AIEEE 2005] Q.13 (1) Zr and Y have about the same radius (2) Zr and Nb have similar oxidation state (3) Zr and Hf have about the same radius (4) Zr and Zn have the same oxidation state Q.14 The increasing order of the first ionization enthalpies of the elements B, P, S and F (lowest first) is – [AIEEE 2006] (2) P < S < B < F (3) B < P < S < F (4) B < S < P < F(1) F < S < P < BWhich one of the following sets of ions represents a collection of isoelectronic species? Q.15 [AIEEE 2006] (1)  $N^{3-}$ ,  $O^{2-}$ ,  $F^{-}$ ,  $S^{2-}$  $(2) Li^+, Na^+, Mg^{2+}, Ca^{2+}$ (4) Ba<sup>2+</sup>, Sr<sup>2+</sup>, K<sup>+</sup>, Ca<sup>2+</sup> (3)  $K^+$ ,  $Cl^-$ ,  $Ca^{2+}$ ,  $Sc^{3+}$ In which of the following arrangements, the sequence is not strictly according to the property written Q.16 against it? [AIEEE 2009] (1)  $H_2O < H_2S < H_2Se < H_2Te$ : Increasing acidic strength (2) HF < HCl < HBr < HI : Increasing acidic strength (3) NH<sub>3</sub> > PH<sub>3</sub> < AsH<sub>3</sub> < SbH<sub>3</sub>: Increasing basic strength (4) B < C < O < N: increasing first ionization enthalpy





Q.34	Which of the follow (1) Sc	ving atoms has the highest f (2) Rb	first ionization energy? (3) Na	[JEE (Main-Offline) 2016] (4) K			
Q.35	The following statements concern elements in the periodic table. Which of the following is true?  (1) All the elements in Group 17 are gases.  (2) The Group 13 elements are all metals.  (3) Elements of Group 16 have lower ionization enthalpy values compared to those of Group 15 in the corresponding periods.  (4) For Group 15 elements, the stability of +5 oxidation state increases down the group.  [JEE (Main-Online) 2016]						
Q.36	The group having is (1) O <sup>-</sup> , F <sup>-</sup> , Na, Mg (3) O <sup>-</sup> , F <sup>-</sup> , Na <sup>+</sup> , Mg		(2) O <sup>2–</sup> , F <sup>–</sup> , Na, Mg <sup>2</sup> (4) O <sup>2–</sup> , F <sup>–</sup> , Na <sup>+</sup> , Mg				
Q.37	Element  A B  Which of the follow (1) Both 'A' and 'B (2) Both 'A' and 'B (3) Both 'A' and 'B	lonisation enthalpies of lonisation enthalpy (kd 1 <sup>st</sup> 2 <sup>nd</sup> 899 1757 737 1450 wing statements is correct? belong to group-1 where belong to group-2 where	y/mol) 3 <sup>rd</sup> 14847 7731 e 'B' comes below 'A'. e 'A' comes below 'B'. e 'B' comes below 'A'.	[JEE (Main-Online) 2017]			
Q.38	The electronic confi (1) [Ne] 3s <sup>2</sup> 3p <sup>1</sup>	iguration with the highest id (2) [Ne] 3s <sup>2</sup> 3p <sup>2</sup>	onization enthalpy is: (3) [Ne] 3s <sup>2</sup> 3p <sup>3</sup>	(4) [Ar] 3d <sup>10</sup> 4s <sup>2</sup> 4p <sup>3</sup> [ <b>JEE (Main-Online) 2017</b> ]			
Q.39	The <b>correct</b> order of $(1)$ Cl > F > O	of electron affinity is: (2) O > F > Cl	(3) F > Cl > O	(4) F > O > Cl [JEE (Main-Online) 2018]			
Q.40	For Na <sup>+</sup> , Mg <sup>2+</sup> , F <sup>-</sup> a (1) Mg <sup>2+</sup> < O <sup>2-</sup> < N (3) Na <sup>+</sup> < Mg <sup>2+</sup> < F		er of increasing ionic radii (2) Mg <sup>2+</sup> < Na <sup>+</sup> < F <sup>-</sup> < (4) O <sup>2-</sup> < F <sup>-</sup> < Na <sup>+</sup> < N	$<$ $O^{2-}$			
Q.41	<ul><li>(1) Electron gain en</li><li>(2) Electronegativit</li></ul>	thalpy and electronegativity y and electron gain enthalp nd electronegativity	ty	periodic table, respectively are  [JEE (Main-Online) 2019]			

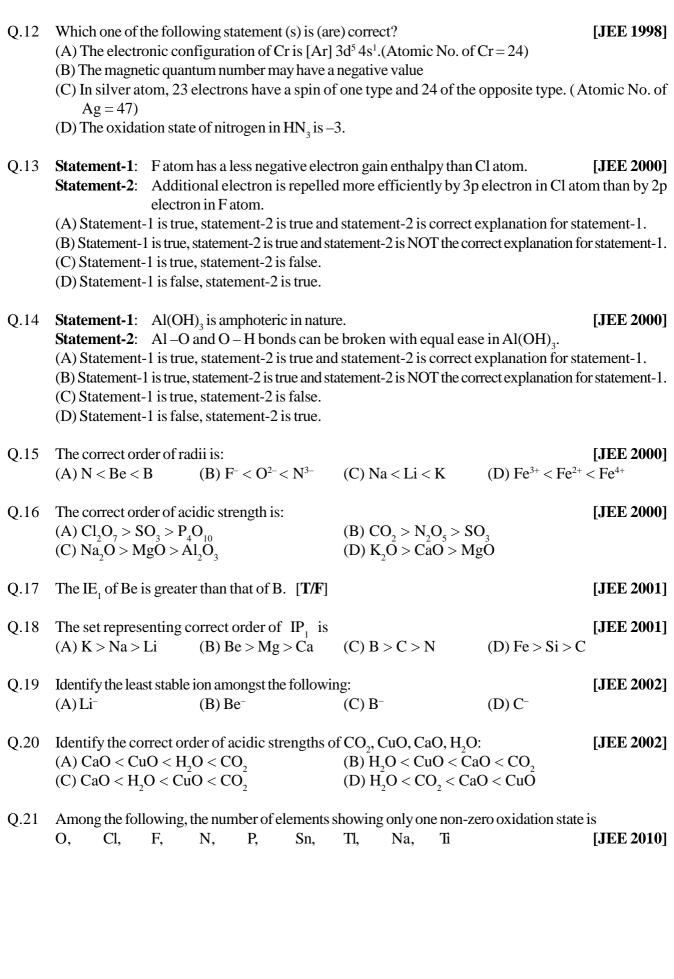




Q.61	The electron gain enthalpy (in kJ/mol) of fluori (1) -296, -325, -333 and -349 (3) -349, -333, -325 and -296	ine, chlorine, bromine and iodine, respectively, are (2) -333, -349, -325 and -296 (4) -333, -325, -349 and -296  [JEE (Main-Online) 2020]			
Q.62	energy upon an electron gain are	nd Li & Na, respectively, the elements that release more  (3) F, S and Li  (4) F, Se and Na  [JEE (Main-Online) 2020]			
Q.63	The increasing order of the atomic radii of the factor (a) C (b) O (d) Cl (e) Br $(1)(a) < (b) < (c) < (d) < (e)$ (3) $(d) < (c) < (b) < (a) < (e)$	Following elements is (c) F  (2) (c) < (b) < (a) < (d) < (e) (4) (b) < (c) < (d) < (a) < (e)  [JEE (Main-Online) 2020]			
Q.64	2s electrons of Be.  (III) 2s electron has more penetration power  (IV) atomic radius of B is more than Be  (atomic number B = 5, Be = 4)  The correct statements are	2s electron.  the nucleus by the inner core of electrons than the			
Q.65	The acidic basic and amphoteric oxides, respe (1) Cl <sub>2</sub> O, CaO, P <sub>4</sub> O <sub>10</sub> (3) N <sub>2</sub> O <sub>3</sub> , Li <sub>2</sub> O, Al <sub>2</sub> O <sub>3</sub>	ctively, are (2) Na <sub>2</sub> O, SO <sub>3</sub> , Al <sub>2</sub> O <sub>3</sub> (4) MgO, Cl <sub>2</sub> O, Al <sub>2</sub> O <sub>3</sub> [JEE (Main-Online) 2020]			
Q.66	The oxidation states of transition metal atoms and z. The sum of x, y and z is	in $K_2Cr_2O_7$ , $KMnO_4$ and $K_2FeO_4$ , respectively, are x, y [JEE (Main-Online) 2020]			

### [JEE ADVANCED]

Q.1	Moving from right to left in a periodic table, the atomic size is: [JEE]						
	(A) increased	(B) decreased	(C) remains constant	(D) none of thes	e		
Q.2	The increasing order of	electronegativity in the f	following elements:		[JEE 1995]		
	(A) C, N, Si, P	(B) N, Si, C, P	(C) Si, P, C, N	(D) P, Si, N, C			
Q.3	statement for that element	ent is:	onic configuration is 1s	$s^2$ , $2s^2 2p^6$ , $3s^2 3p^6$	4s <sup>1</sup> . The true		
	(A) Highest value of IE		(B) Transition element	FYEN 400 FI			
	(C) Isotone with $_{18}Ar^{38}$	5	(D) None		[JEE 1995]		
Q.4	The number of paired e	electrons in oxygen atom	ris:		[JEE 1995]		
	(A) 6	(B) 16	(C) 8	(D) 32			
Q.5		K+, Ca <sup>2+</sup> , Cl- & S <sup>2-</sup> follo	ows the order:		[REE 1995]		
	(A) $K^+ > Ca^{+2} > S^{-2} >$		(B) $K^+ > Ca^{+2} > Cl^- >$ (D) $S^{-2} > Cl^- > K^+ > Cl^- > C$				
	(C) $Ca^{+2} > K^{+} > Cl^{-} > R^{+}$	$Ca^{+2}$					
Q.6	Which of the following		[JEE 1996]				
	(A) CO	$(B) SnO_2$	(C) ZnO	$(D) SiO_2$			
Q.7	Which of the following		[JEE 1996]				
<b>~</b> ··	$(A) Mg^{2+}$	(B) Ti <sup>3+</sup>	$(C) V^{3+}$	$(D)  Fe^{2+}$	[022 2>>0]		
Q.8	The following acids ha	id strength. Identi	fy the correct [JEE 1996]				
	ClOH(I)	BrOH(II)	IOH(III)				
	(A) I > II > III	(B) $II > I > III$	(C) III > II > I	(D) I > III > II			
Q.9	The incorrect statement among the following is:						
	<ul> <li>(A) the first ionisation potential of Al is less than the first ionisation potential of Mg</li> <li>(B) the second ionisation potential of Mg is greater than the second ionisation potential of Na</li> <li>(C) the first ionisation potential of Na is less than the first ionisation potential of Mg</li> <li>(D) the third ionisation potential of Mg is greater than the third ionisation potential of Al</li> </ul>						
Q.10	Which of the following (A) Be(OH) <sub>2</sub>	are amphoteric? (B) Sr(OH) <sub>2</sub>	(C) Ca(OH),	(D) Al(OH) <sub>3</sub>	[REE 1997]		
	2	2	2	(-/(0-2/3			
Q.11	Li <sup>+</sup> , Mg <sup>2+</sup> , K <sup>+</sup> , Al <sup>3+</sup> (Arr	ange in increasing order	of radii)		[JEE 199 <b>7</b> ]		



Q.22 The increasing order of atomic radii of the following Group 13 elements is [JEE (Advanced) 2016]

(A) Al < Ga < In < Tl (B) Ga < Al < In < Tl

(C) Al < In < Ga < Tl (D) Al < Ga < Tl < In

Q.23 The option(s) with only amphoteric oxide is(are)

0.2

2

0.1

1

[JEE (Advanced) 2017]

0.5

1

(A) Cr<sub>2</sub>O<sub>3</sub>, BeO, SnO, SnO<sub>2</sub>

(B) Cr<sub>2</sub>O<sub>3</sub>, CrO, SnO, PbO

(C) ZnO,  $Al_2O_3$ , PbO, PbO<sub>2</sub>

(D) NO, B<sub>2</sub>O<sub>3</sub>, PbO, SnO<sub>2</sub>

0.4

2



# CLASSIFICATION OF ELEMENTS & PERIODIC PROPERTIES [JEE MAIN]

2

0.3

Q.1	1	Q.2	<del>_</del>	Q.3	<del>_</del>	Q. I	_	Q.5	1
Q.6	1	Q.7	3	Q.8	1	Q.9	4	Q.10	1
Q.11	2	Q.12	1	Q.13	3	Q.14	4	Q.15	3
Q.16	3	Q.17	2	Q.18	4	Q.19	1	Q.20	1
Q.21	1	Q.22	2	Q.23	4	Q.24	3	Q.25	3
Q.26	3	Q.27	4	Q.28	4	Q.29	1	Q.30	3
Q.31	1	Q.32	1	Q.33	1	Q.34	1	Q.35	3
Q.36	4	Q.37	3	Q.38	3	Q.39	1	Q.40	2
Q.41	4	Q.42	3	Q.43	1	Q.44	3	Q.45	1
Q.46	1	Q.47	2	Q.48	4	Q.49	3	Q.50	
Q.51	4	Q.52		Q.53	4	Q.54	2	Q.55	2
Q.56	4	Q.57		Q.58	4	Q.59	3	Q.60	101.00
Q.61	2	Q.62	2	Q.63	2	Q.64	3	Q.65	3
Q.66	19.00								

#### [JEE ADVANCED]

Q.1	A	Q.2	C	Q.3	C	Q.4	A	Q.5	D
Q.6	A	Q.7	D	Q.8	A	Q.9	В	Q.10	A
Q.11	$Al^{+3} < Mg^{2+} <$	$Li^+ < K$	+	Q.12	ABC	Q.13	C	Q.14	C
Q.15	В	Q.16	A	Q.17	True	Q.18	В	Q.19	В
Q.20	A	Q.21	2	Q.22	В	Q.23	AC		