CHEMISTRY

p-Block Elements (Group 15, 16, 17 and 18)

No. of Questions	Maximum Marks	Time
45	180	1 Hour

Speed TEST 49
Chapter-wise

GENERAL INSTRUCTIONS

- This test contains 45 MCQ's. For each question only one option is correct. Darken the correct circle/ bubble in the Response Grid provided on each page.
- You have to evaluate your Response Grids yourself with the help of solutions provided at the end of this book.
- Each correct answer will get you 4 marks and 1 mark shall be deduced for each incorrect answer. No mark will be given/ deducted if no bubble is filled. Keep a timer in front of you and stop immediately at the end of 60 min.
- The sheet follows a particular syllabus. Do not attempt the sheet before you have completed your preparation for that syllabus.
- After completing the sheet check your answers with the solution booklet and complete the Result Grid. Finally spend time to analyse your performance and revise the areas which emerge out as weak in your evaluation.

1. The brown ring test for NO_2^- and NO_3^- is due to the formation of complex ion with a formula
(a) $[Fe(H_2O)_6]^{2+}$ (b) $[Fe(NO)(CN)_5]^{2+}$
(c) $[Fe(H_2O)_5NO]^{2+}$ (d) $[Fe(H_2O)(NO)_5]^{2+}$

2. Which of the following shows nitrogen with its increasing order of oxidation number?
(a) $NO < N_2O < NO_2 < NO_3^- < NH_4^+$
(b) $NH_4^+ < N_2O < NO_2 < NO_3^- < NO$
(c) $NH_4^+ < N_2O < NO < NO_2 < NO_3^-$
(d) $NH_4^+ < NO < N_2O < NO_2 < NO_3^-$

3. Which one of the following is the correct decreasing order of boiling point?
(a) $H_2Te > H_2O > H_2Se > H_2S$
(b) $H_2O > H_2S > H_2Se > H_2Te$
(c) $H_2Te > H_2Se > H_2S > H_2O$
(d) $H_2O > H_2Te > H_2Se > H_2S$

4. The true statement for the acids of phosphorus. H_3PO_2, H_3PO_3, and H_3PO_4 is :
(a) the order of their acidity is $H_3PO_4 < H_3PO_3 <, H_3PO_2$
(b) all of them are reducing in nature
(c) all of them are tribasic acids
(d) the geometry of phosphorus is tetrahedral in all the three

5. The acid which forms two series of salts is
(a) H_3PO_4 (b) H_3PO_3 (c) H_3BO_3 (d) $H_3PO_2^-$

RESPONSE GRID 1. ⓐⓑⓒⓓ 2. ⓐⓑⓒⓓ 3. ⓐⓑⓒⓓ 4. ⓐⓑⓒⓓ 5. ⓐⓑⓒⓓ

Space for Rough Work

6. The nitrogen oxides that contain(s) N–N bond(s) is /are
(i) N_2O (ii) N_2O_3 (iii) N_2O_4 (iv) N_2O_5
(a) (i), (ii) (b) (ii), (iii), (iv)
(c) (iii), (iv) (d) (i), (ii) and (iii)

7. The geometry of ClO_3^- according to valence shell electron pair repulsion (VSEPR) theory will be
(a) planar triangle (b) pyramidal
(c) tetrahedral (d) square planar

8. It is possible to obtain oxygen from air by fractional distillation because
(a) oxygen is in a different group of the periodic table from nitrogen
(b) oxygen is more reactive than nitrogen
(c) oxygen has higher b.p. than nitrogen
(d) oxygen has a lower density than nitrogen

9. Which of the following is the most basic oxide?
(a) Sb_2O_3 (b) Bi_2O_3 (c) SeO_2 (d) Al_2O_3

10. Which compound is used in photography?
(a) Na_2SO_5 (b) $Na_2S_2O_8$
(c) $Na_2S_2O_6$ (d) $Na_2S_2O_3$

11. The oxyacid of phosphorous in which phosphorous has the lowest oxidation state is
(a) hypophosphorous acid
(b) orthophosphoric acid
(c) pyrophosphoric acid
(d) metaphosphoric acid

12. Which of the following statements is not valid for oxoacids of phosphorus?
(a) Orthophosphoric acid is used in the manufacture of triple superphosphate.
(b) Hypophosphorous acid is a diprotic acid.
(c) All oxoacids contain tetrahedral four coordinated phosphorus.
(d) All oxoacids contain atleast one P = O and one P — OH group.

13. Which one of the following reactions of xenon compounds is not feasible?
(a) $3XeF_4 + 6H_2O \longrightarrow 2Xe + XeO_3 + 12HF + 1.5O_2$
(b) $2XeF_2 + 2H_2O \longrightarrow 2Xe + 4HF + O_2$
(c) $XeF_6 + RbF \longrightarrow Rb[XeF_7]$
(d) $XeO_3 + 6HF \longrightarrow XeF_6 + 3H_2O$

14. The compound of sulphur that can be used as refrigerant is
(a) SO_2 (b) SO_3 (c) S_2Cl_2 (d) H_2SO_4

15. Which of the following on thermal decomposition gives oxygen gas ?
(a) Ag_2O (b) Pb_3O_4
(c) PbO_2 (d) All of these

16. Which of the following statements are correct?
(i) Arsenic and antimony are metalloids.
(ii) Phosphorus, arsenic and antimony are found mainly as sulphide minerals.
(iii) Covalent radii increases equally from N to Bi.
(iv) Elements of group 15 have extra stability and higher ionisation energy due to exactly half filled ns^2np^3 electronic configuration.
(v) In group 15 elements only nitrogen is gas whereas all others are solids.
(a) (i), (iv) and (v) (b) (ii), (iii) and (iv)
(c) (i), (ii) and (iii) (d) (ii), (iii) and (v)

17. The formation of $O_2^+[PtF_6]^-$ is the basis for the formation of xenon fluorides. This is because
(a) O_2 and Xe have comparable sizes
(b) both O_2 and Xe are gases
(c) O_2 and Xe have comparable ionisation energies
(d) Both (a) and (c)

18. Oxidation of thiosulphate by iodine gives
(a) tetrathionate ion (b) sulphide ion
(c) sulphate ion (d) sulphite ion

19. The hybridization in ICl_7 is
(a) sp^3d^3 (b) d^2sp^3 (c) sp^3d (d) sp^3

RESPONSE GRID

6. (a)(b)(c)(d)	**7.** (a)(b)(c)(d)	**8.** (a)(b)(c)(d)	**9.** (a)(b)(c)(d)	**10.** (a)(b)(c)(d)
11. (a)(b)(c)(d)	**12.** (a)(b)(c)(d)	**13.** (a)(b)(c)(d)	**14.** (a)(b)(c)(d)	**15.** (a)(b)(c)(d)
16. (a)(b)(c)(d)	**17.** (a)(b)(c)(d)	**18.** (a)(b)(c)(d)	**19.** (a)(b)(c)(d)	

Space for Rough Work

20. Match the columns.

Column-I		Column-II
A.	Pb_3O_4	I. Neutral oxide
B.	N_2O	II. Acidic oxide
C.	Mn_2O_7	III. Basic oxide
D.	Bi_2O_3	IV. Mixed oxide

(a) A – I; B – II; C – III; D – IV
(b) A – IV; B – I; C – II; D – III
(c) A – III; B – II; C – IV; D – I
(d) A – IV; B – III; C – I; D – II

21. Which one of the following arrangements does not give the correct picture of the trends indicated against it ?
(i) $F_2 > Cl_2 > Br_2 > I_2$: Oxidizing power
(ii) $F_2 > Cl_2 > Br_2 > I_2$: Electron gain enthalpy
(iii) $F_2 > Cl_2 > Br_2 > I_2$: Bond dissociation energy
(iv) $F_2 > Cl_2 > Br_2 > I_2$: Electronegativity.
(a) (ii) and (iv) (b) (i) and (iii)
(c) (ii) and (iii) (d) (ii), (iii) and (iv)

22. Which of the following is a saline oxide ?
(a) Na_2O_2 (b) BaO_2 (c) Na_2O (d) Fe_2O_3

23. Shape of $XeOF_4$ is
(a) octahedral (b) square pyramidal
(c) pyramidal (d) T-shaped

24. Which among the following is paramagnetic ?
(a) Cl_2O (b) ClO_2 (c) Cl_2O_7 (d) Cl_2O_6

25. The molecule having smallest bond angle is :
(a) NCl_3 (b) $AsCl_3$ (c) $SbCl_3$ (d) PCl_3

26. Which one of the following orders correctly represents the increasing acid strengths of the given acids?
(a) $HOCl < HOCl < HOClO_3 < HOClO_2$
(b) $HOClO_2 < HOClO_3 < HOClO < HOCl$
(c) $HOClO_3 < HOClO_2 < HOClO < HOCl$
(d) $HOCl < HOClO < HOClO_2 < HOClO_3$

27. The ease of liquefaction of noble gases increases in the order
(a) $He < Ne < Ar < Kr < Xe$
(b) $Xe < Kr < Ne < Ar < He$
(c) $Kr < Xe < He < Ne < Ar$
(d) $Ar < Kr < Xe < Ne < He$

28. A certain compound (X) when treated with copper sulphate solution yields a brown precipitate. On adding hypo solution, the precipitate turns white. The compound is
(a) K_2CO_3 (b) KI (c) KBr (d) K_3PO_4

29. Which of the following species is not a pseudo halide
(a) CNO^- (b) $RCOO^-$ (c) OCN^- (d) NNN^-

30. Which of the following is used to produce and sustain powerful superconducting magnets to form an essential part of NMR spectrometer ?
(a) Ar (b) Ne (c) Rn (d) He

31. The product obtained as a result of a reaction of nitrogen with CaC_2 is
(a) $Ca(CN)_2$ (b) CaCN (c) $CaCN_3$ (d) Ca_3CN

32. Which of the following noble gases has the highest negative electron gain enthalpy value?
(a) Helium (b) Krypton
(c) Argon (d) Neon

33. Gaseous HCl is a poor conductor of electricity while its aqueous solution is a good conductor this is because
(a) H_2O is a good conductor of electricity
(b) a gas cannot conduct electricity but a liquid can
(c) HCl gas does not obey Ohm's law, whereas the solution does
(d) HCl ionises in aqueous solution

34. Density of nitrogen gas prepared from air is slightly greater than that of nitrogen prepared by chemical reaction from a compound of nitrogen due to the presence of
(a) argon
(b) carbon dioxide
(c) some N_3 molecules analogous to O_3
(d) greater amount of N_2 molecules derived from N-15 isotope

RESPONSE GRID				
20. ⓐⓑⓒⓓ	**21.** ⓐⓑⓒⓓ	**22.** ⓐⓑⓒⓓ	**23.** ⓐⓑⓒⓓ	**24.** ⓐⓑⓒⓓ
25. ⓐⓑⓒⓓ	**26.** ⓐⓑⓒⓓ	**27.** ⓐⓑⓒⓓ	**28.** ⓐⓑⓒⓓ	**29.** ⓐⓑⓒⓓ
30. ⓐⓑⓒⓓ	**31.** ⓐⓑⓒⓓ	**32.** ⓐⓑⓒⓓ	**33.** ⓐⓑⓒⓓ	**34.** ⓐⓑⓒⓓ

Space for Rough Work

35. The correct order of acidic strength is
(a) $Cl_2O_7 > SO_2 > P_4O_{10}$
(b) $CO_2 > N_2O_5 > SO_3$
(c) $Na_2O > MgO > Al_2O_3$
(d) $K_2O > CaO > MgO$

36. Sulphur trioxide can be obtained by which of the following reaction :

(a) $CaSO_4 + C \xrightarrow{\Delta}$ (b) $Fe_2(SO_4)_3 \xrightarrow{\Delta}$

(c) $S + H_2SO_4 \xrightarrow{\Delta}$ (d) $H_2SO_4 + PCl_5 \xrightarrow{\Delta}$

37. The correct order of increasing bond angles in the following species are :

(a) $Cl_2O < ClO_2 < ClO_2^-$

(b) $ClO_2 < Cl_2O < ClO_2^-$

(c) $Cl_2O < ClO_2^- < ClO_2$

(d) $ClO_2^- < Cl_2O < ClO_2$

38. Which one of the following oxides of chlorine is obtained by passing dry chlorine over silver chlorate at 90°C ?
(a) Cl_2O (b) ClO_3 (c) ClO_2 (d) ClO_4

39. The shape of XeO_2F_2 molecule is
(a) trigonal bipyramidal (b) square planar
(c) tetrahedral (d) see-saw

40. Number of lone pairs of electrons on Xe atoms XeF_2, XeF_4 and XeF_6 molecules are respectively
(a) 3, 2 and 1 (b) 4, 3 and 2
(c) 2, 3 and 1 (d) 3, 2 and 0

41. Match the interhalogen compounds of column-I with the geometry in column II and assign the correct code.

Column-I		Column-II	
A.	XX'	I.	T-shape
B.	XX'_3	II.	Pentagonal bipyramidal
C.	XX'_5	III.	Linear
D.	XX'_7	IV.	Square-pyramidal
		V.	Tetrahedral

(a) A – III; B – I; C – IV; D – II
(b) A – V; B – IV; C – III; D – II
(c) A – IV; B – III; C – II; D – I
(d) A – III; B – IV; C – I; D – II

42. The crystals of ferrous sulphate on heating give :

(a) $FeO + SO_2 + H_2O$

(b) $FeO + SO_3 + H_2SO_4 + H_2O$

(c) $Fe_2O_3 + SO_2 + H_2SO_4 + H_2O$

(d) $Fe_2O_3 + H_2SO_4 + H_2O$

43. One mole of fluorine is reacted with two moles of hot and concentrated KOH. The products formed are KF, H_2O and O_2. The molar ratio of KF, H_2O and O_2 respectively is
(a) 1 : 1 : 2 (b) 2 : 1 : 0.5
(c) 1 : 2 : 1 (d) 2 : 1 : 2

44. A greenish yellow gas reacts with an alkali metal hydroxide to form a halate which can be used in fire works safety matches. The gas and halate respectively are
(a) $Br_2, KBrO_3$ (b) $Cl_2, KClO_3$
(c) $I_2, NaIO_3$ (d) $Cl_2, NaClO_3$

45. Yellow ammonium sulphide is

(a) $(NH_4)_2S_8$ (b) $(NH_4)_2S$

(c) $(NH_4)_2S_x$ (d) $(NH_4)_2S_4$

RESPONSE GRID					
	35. ⓐⓑⓒⓓ	**36.** ⓐⓑⓒⓓ	**37.** ⓐⓑⓒⓓ	**38.** ⓐⓑⓒⓓ	**39.** ⓐⓑⓒⓓ
	40. ⓐⓑⓒⓓ	**41.** ⓐⓑⓒⓓ	**42.** ⓐⓑⓒⓓ	**43.** ⓐⓑⓒⓓ	**44.** ⓐⓑⓒⓓ
	45. ⓐⓑⓒⓓ				

CHEMISTRY CHAPTERWISE SPEED TEST-49			
Total Questions	45	Total Marks	180
Attempted		Correct	
Incorrect		Net Score	
Cut-off Score	37	Qualifying Score	58
Success Gap = Net Score – Qualifying Score			
Net Score = (Correct × 4) – (Incorrect × 1)			

Space for Rough Work