24. The p -Block Elements (Nitrogen, Oxygen, Halogen and Noble Family) – Multiple Choice Questions

1. Nitrogen Family

1. The strongest reducing agent among the following is

(a) NH_3 (b) PH_3

(c) AsH_3 (d) SbH_3

2. Which of the following is not hydrolysed

(a) $AsCl_3$ (b) PF_3

(c) $SbCl_3$ (d) NF_3

3. Electrolysis temperature is maximum for

(a) AsH_3 (b) NH_3

(c) PH_3 (d) SbH_3

4. Which does not form complex

(a) N (b) P

(c) As (d) Bi

5. Correct order of decreasing thermal stability is as

(a) $NH_3 > PH_3 > AsH_3 > SbH_3$

(b) $PH_3 > NH_3 > AsH_3 > SbH_3$

(c) $AsH_3 > PH_3 > NH_3 > SbH_3$

(d) $SbH_3 > AsH_3 > PH_3 > NH_3$

6. Calcium cyanamide on treatment with steam under pressure gives ammonia and

(a) Calcium carbonate (b) Calcium hydroxide

(c) Calcium oxide (d) Calcium bicarbonate

7. Which of the following has the highest proton affinity

(a) Stibine (SbH_3) (b) Arsine (AsH_3)

(c) Phosphine (PH_3) (d) Ammonia (NH_3)

8. Which of the following exhibits highest solubility in water

(a) NH_3 (b) PH_3

(c) AsH_3 (d) SbH_3

9. P_4O_{10} is not used to dry NH_3 gas because

(a) P_4O_{10} is basic and NH_3 is acidic

(b) P_4O_{10} is acidic and NH_3 is basic

(c) P_4O_{10} is not a drying agent

(d) P_4O_{10} reacts with moisture in NH_3

10. An element (X) forms compounds of the formula XCl_3, X_2O_5 and Ca_3X_2, but does not form XCl_5, which of the following is the element X

(a) B (b) Al

(c) N (d) P

11. Which of the following elements can be involved in $p\pi - d\pi$ bonding

(a) Carbon (b) Nitrogen

(c) Phosphorus (d) Boron

12. Which of the following elements does not show allotropy

(a) Nitrogen (b) Bismuth

(c) Antimony (d) Arsenic

13. Elements of group- 15 form compounds in +5 oxidation state. However, bismuth forms only one well characterised compound in +5 oxidation state. The compound is

(a) Bi_2O_5 (b) BiF_5

(c) $BiCl_5$ (d) Bi_2S_5

14. Bond dissociation enthalpy of $E-H$ (E = element) bonds are given below. Which of the compounds will act as strongest reducing agent

Compound	NH_3	PH_3	AsH_3	SbH_3
$\Delta_{diss}(E-H)/kJ\ mol^{-1}$	389	322	297	255

(a) NH_3 (b) PH_3

(c) AsH_3 (d) SbH_3

15. Match **List I** (Molecules) with **List II** (Boiling points) and select the correct answer

	List I		**List II**
(A)	NH_3	(i)	290 K
(B)	PH_3	(ii)	211 K
(C)	AsH_3	(iii)	186 K
(D)	SbH_3	(iv)	264 K
(E)	BiH_3	(v)	240 K

(a) A – iii, B – ii, C – v, D – iv, E – i

(b) A – v, B – iii, C – ii, D – iv, E – i

(c) A – i, B – iv, C – v, D – ii, E – iii

(d) A – i, B – ii, C – iii, D – iv, E – v

16. Which of the following statements is wrong

(a) Single $N-N$ bond is stronger than the single $P-P$ bond

(b) PH_3 can act a ligand in the formation of coordination compound with transition elements.

(c) NO_2 is paramagnetic in nature

(d) Covalency of nitrogen in N_2O_5 is four.

17. Which of the following represents laughing gas

(a) NO (b) N_2O

(c) NO_2 (d) N_2O_3

18. The correct order of acidic nature of oxides is in the order

(a) $NO < N_2O < N_2O_3 < NO_2 < N_2O_5$

(b) $N_2O < NO < N_2O_3 < NO_2 < N_2O_5$

(c) $N_2O_5 < NO_2 < N_2O_3 < NO < N_2O$

(d) $N_2O_5 < N_2O_3 < NO_2 < NO < N_2O$

19. Nitrogen dioxide is released by heating

(a) $Pb(NO_3)_2$ (b) KNO_3

(c) $NaNO_2$ (d) $NaNO_3$

20. Urea is preferred to ammonium sulphate as a nitrogenous fertilizer because

(a) It is more soluble in water

(b) It is cheaper than ammonium sulphate

(c) It is quite stable

(d) It does not cause acidity in the soil

21. Liquid ammonia is used for refrigeration because

(a) It has a high dipole moment

(b) It has a high heat of vaporisation

(c) It is basic

(d) It is a stable compound

22. Inertness of N_2 gas is due to

(a) No vacant *d*-orbital

(b) High dissociation energy

(c) High electronegativity

(d) None

23. The carbonate which does not leave a residue on heating is

(a) Na_2CO_3 (b) Ag_2CO_3

(c) $CuCO_3$ (d) $(NH_4)_2CO_3$

24. Aqua-regia is

(a) 1 : 3 conc. HNO_3 and conc. HCl

(b) 1 : 2 conc. HNO_3 and conc. HCl

(c) 3 : 1 conc. HNO_3 and conc. HCl

(d) 2 : 1 conc. HNO_3 and conc. HCl

25. Conc. HNO_3 can be stored in container of

(a) Al (b) Sn

(c) Cu (d) Zn

26. In the nitrogen family, the $H-M-H$ bond angle in the hydrides MH_3 gradually becomes closer to 90° on going from N to Sb. This shows that gradually

(a) The basic strength of hydrides increases

(b) Almost pure *p*-orbitals are used for $M-H$ bonding

(c) The bond energies of $M-H$ bond increase

(d) The bond pairs of electrons become nearer to the central atom

27. Ammonia, on reaction with excess of chlorine, gives

(a) NCl_3 and HCl (b) N_4 and NH_4Cl

(c) NCl_3 and NH_4Cl (d) N_2 and HCl

28. When heated NH_3 is passed over CuO, gas evolved is

(a) N_2 (b) N_2O

(c) HNO_3 (d) NO_2

29. Which one of the following statements is true for HNO_2

(a) It is very stable in aqueous solution

(b) It cannot act both as an oxidant and as a reductant

(c) It cannot act as an oxidising agent

(d) It cannot act as reducing agent

30. The following two reactions of HNO_3 with Zn are given as (equations are not balanced)

$Zn + conc.\ HNO_3 \longrightarrow Zn(NO_3)_2 + X + H_2O$.....(i)

$Zn + dilute.\ HNO_3 \longrightarrow Zn(NO_3)_2 + Y + H_2O$.....(ii)

In reactions (i) and (ii), the compounds X and Y respectively, are

(a) NO_2 and NO (b) NO_2 and NO_2

(c) NO and NO_2 (d) NO_2 and NH_4NO_3

31. When lightning flash is produced, which gas may form

(a) Nitrous oxide (b) Nitrogen dioxide

(c) Dinitrogen pentoxide (d) Nitric oxide

32. A mixture of ammonia and air at about $800°C$ in the presence of Pt gauze forms

(a) N_2O (b) NO

(c) NH_2OH (d) N_2O_3

33. A hydride of nitrogen which is acidic is

(a) NH_3 (b) N_2H_4

(c) N_2H_2 (d) N_3H

34. Nitric acid can be obtained from ammonia via the formations of the intermediate compounds

(a) Nitric oxides and nitrogen dioxides

(b) Nitrogen and nitric oxides

(c) Nitric oxide and dinitrogen pentoxide

(d) Nitrogen and nitrous oxide

35. When ammonia reacts with sodium hypochlorite, product containing nitrogen is

(a) N_2 (b) N_2O

(c) NH_2OH (d) $H_2N.NH_2$

36. Inorganic graphite is

(a) $B_3N_3H_6$ (b) B_3N_3

(c) SiC (d) $Fe(CO)_5$

37. Which of the following oxide of nitrogen is most thermally stable

(a) N_2O_5 (b) N_2O

(c) NO (d) N_2O_3

38. When plants and animals decay, the organic nitrogen is converted into inorganic nitrogen. The inorganic nitrogen is in the form of

(a) Ammonia (b) Elements of nitrogen

(c) Nitrates (d) Nitrides

39. The hydrolysis of NCl_3 by water produces

(a) NH_2OH and $HOCl$ (b) NH_2NH_2 and HCl

(c) NH_4OH and $HOCl$ (d) NH_2Cl and $HOCl$

40. Which of the following statements about liquid nitrogen is true

(a) It is unreactive

(b) It is used in cryosurgery

(c) It does not decompose organic compounds

(d) It is very stable

41. An aqueous solution of nitrous acid (HNO_2), free of salts, can be obtained from the reaction

(a) $Ba(NO_2)_2 + H_2SO_4 \longrightarrow$

(b) $NaNO_2 + H_2SO_4 \xrightarrow{Cold}$

(c) $NH_4NO_2 + H_2SO_4 \longrightarrow$

(d) $KNO_3 + HNO_3 \longrightarrow$

42. At given temperature and pressure adsorption of which gas of the following will take place the most

(a) Di hydrogen (b) Di oxygen

(c) Ammonia d) Di nitrogen

43. The metal which does not form ammonium nitrate by reaction with dilute nitric acid is

(a) Al (b) Fe

(c) Pb (d) Mg

44. A brown ring is formed in the ring test for NO_3^- ion. It is due to the formation of

(a) $[Fe(H_2O)_5\ (NO)]^{2+}$ (b) $FeSO_4.NO_2$

(c) $[Fe(H_2O)_4\ (NO)_2]^{2+}$ (d) $FeSO_4.HNO_3$

45. On heating ammonium dichromate and barium azide separately we get

(a) N_2 in both cases

(b) N_2 with ammonium dichromate and NO with barium azide

(c) N_2O with ammonium dichromate and N_2 with barium azide

(d) N_2O with ammonium dichromate and NO_2 with barium azide

46. In the preparation of HNO_3, we get NO gas by catalytic oxidation of ammonia. The moles of NO produced by the oxidation of two moles of NH_3 will be.....

(a) 2 (b) 3

(c) 4 (d) 6

47. Maximum covalency of nitrogen is.....

(a) 3 (b) 5

(c) 4 (d) 6

48. P_4O_6 reacts with water to give

(a) H_3PO_3 (b) $H_4P_2O_7$

(c) HPO_3 (d) H_3PO_4

49. Phosphine is not obtained by the reaction

(a) White P is heated with $NaOH$

(b) Red P is heated with $NaOH$

(c) Ca_3P_2 reacts with water

(d) Phosphorus trioxide is boiled with water

50. By the action of hot conc. H_2SO_4, phosphorus changes to

(a) Phosphorus acid (b) Orthophosphoric acid

(c) Metaphosphoric acid (d) Pyrophosphoric acid

51. Sodium hydroxide solution reacts with phosphorus to give phosphine. To bring about this reaction, we need

(a) White phosphorus and dil. $NaOH$

(b) White phosphorus and conc. $NaOH$

(c) Red phosphorus and dil. $NaOH$

(d) Red phosphorus and conc. $NaOH$

52. The three important oxidation states of phosphorus are

(a) $-3, +3$ and $+5$ (b) $-3, +3$ and -5

(c) $-3, +4$ and -4 (d) $-3, +3$ and $+4$

53. P_2O_5 is used extensively as a /an

(a) Reducing agent (b) Oxidising agent

(c) Dehydrating agent (d) Preservative

54. Which of the following acids forms three series of salts

(a) H_3PO_2 (b) H_3BO_3

(c) H_3PO_4 (d) H_3PO_3

55. The oxidation state of central atom in the anion of compound NaH_2PO_2 will be .....

(a) + 3 (b) + 5

(c) + 1 (d) – 3

56. In solid state PCl_5 is a .....

(a) Covalent solid

(b) Octahedral structure

(c) Ionic solid with $[PCl_6]^+$ octahedral and $[PCl_4]^-$ tetrahedral

(d) Ionic solid with $[PCl_4]^+$ tetrahedral and $[PCl_6]^-$ octahedral

57. $HNO_3 + P_2O_5 \rightarrow A + B$

A is an oxy-acid of phosphorus and B is an oxide of nitrogen. A and B respectively are

(a) H_3PO_4, N_2O_3 (b) HPO_3, N_2O_3

(c) HPO_3, N_2O_5 (d) H_3PO_3, N_2O_5

58. The role of phosphate in detergent powder is to

(a) Control pH level of the detergent water mixture

(b) Remove Ca^{2+} and Mg^{2+} ions from the water that causes the hardness of water

(c) Provide whiteness to the fabrics

(d) Form solid detergent as phosphate-less detergent are liquid in nature

59. Sides of match box have coating of

(a) Potassium chlorate, red lead

(b) Potassium chlorate, antimony sulphide

(c) Antimony sulphide, red phosphorus

(d) Antimony sulphide, red lead

60. The maximum number of P-H bonds are contained in which of the following molecules

(a) H_3PO_2 (b) H_3PO_3

(c) H_3PO_4 (d) $H_4P_2O_7$

61. Which of the following contains $P-O-P$ bond

(a) Hypophosphorous acid (b) Phosphorus acid

(c) Pyrophosphoric acid (d) Orthophosphoric acid

62. On heating with concentrated NaOH solution in an inert atmosphere of CO_2, white phosphorous gives a gas. Which of the following statement is incorrect about the gas

(a) It is highly poisonous and has smell like rotten fish

(b) It is less basic than NH_3

(c) It's solution in water decomposes in the presence of light

(d) It is more basic than NH_3

63. In a cyclotrimetaphosphoric acid molecule, how many single and double bonds are present

(a) 3 double bonds; 9 single bonds

(b) 6 double bonds; 6 single bonds

(c) 3 double bonds; 12 single bonds

(d) Zero double bond; 12 single bonds

64. The number of $P-H$ bond (s) in H_3PO_2, H_3PO_3 and H_3PO_4 respectively, is

(a) 2, 0, 1 (b) 1, 1, 1

(c) 2, 0, 0 (d) 2, 1, 0

65. Ammonia is not produced in the reaction of

(a) NH_4Cl with KOH (b) AlN with water

(c) NH_4Cl with $NaNO_2$ (d) NH_4Cl with $Ca(OH)_2$

66. White phosphorous catches fire in air to produce dense white fumes. This is due to the formation of

(a) P_4O_{10} (b) PH_3

(c) H_3PO_3 (d) H_3PO_2

67. The oxidation states of P atom in $POCl_3, H_2PO_3$ and $H_4P_2O_6$, respectively, are

(a) +5, +4, +4 (b) +5, +5, +4

(c) +4, +4, +5 (d) +3, +4, +5

2. Oxygen Family

1. Which shows polymorphism

(a) O (b) S

(c) Se (d) All the above

2. A gas that cannot be collected over water is

(a) N_2 (b) O_2

(c) SO_2 (d) PH_3

3. Which element is found in free state

(a) Iodine (b) Sulphur

(c) Phosphorus (d) Magnesium

4. Bond angle is minimum for

(a) H_2O (b) H_2S

(c) H_2Se (d) H_2Te

5. Which of the following dissociates to give H^+ most easily

(a) H_2O (b) H_2S

(c) H_2Te (d) H_2Se

6. Which of the following acts as pickling agent

(a) HNO_3 (b) HCl

(c) H_2SO_4 (d) HNO_2

7. Which one of the following group 16 elements does not exist in –2 oxidation state

(a) S (b) Se

(c) O (d) Po

(e) Te

8. The disease kala azar is cured by

(a) Colloidal antimony (b) Milk of magnesia

(c) Argyrols (d) Colloidal gold

(e) Colloidal silver

9. A black sulphide when reacts with ozone becomes white. The white compound is

(a) $ZnSO_4$ (b) $PbSO_4$

(c) $BaSO_4$ (d) $CaSO_4$

10. Which of the following gas is used in artificial respiration

(a) $O_2 + CO_2$ (b) $O_2 + CO$

(c) $O_2 + H_2$ (d) All of these

11. $KO_2 + CO_2 \rightarrow ?$ (gas)

(a) H_2 (b) N_2

(c) O_2 (d) CO

12. Oxygen is not evolved on reaction of ozone with

(a) H_2O_2 (b) SO_2

(c) Hg (d) KI

13. Electron affinity is positive when

(a) O^- is formed from O (b) O^{2-} is formed from O^-

(c) O^+ is formed from O (d) O^{3-} is formed from O^-

14. Which of the following is a suboxide

(a) Ba_2O (b) $CaCO_3$

(c) C_3O_2 (d) ZnO

15. Match **List I** with **List II** and select the correct answer using the codes given below the lists

List I	List II
(A) Peroxide	(1) C_3O_2
(B) Superoxide	(2) PbO_2
(C) Dioxide	(3) KO_2
(D) Suboxide	(4) H_2O_2

Codes

(a)	A	B	C	D
	4	3	2	1
(b)	A	B	C	D
	3	2	1	4
(c)	A	B	C	D
	4	2	3	1
(d)	A	B	C	D
	4	1	2	3

16. When SO_2 is passed through cupric chloride solution

(a) A white precipitate is obtained

(b) The solution becomes colourless

(c) The solution becomes colourless and a white precipitate of Cu_2Cl_2 is obtained

(d) No visible change takes place

17. Bleaching action of SO_2 is due to

(a) Reduction (b) Oxidation

(c) Hydrolysis (d) Its acidic nature

18. The final acid obtained during the manufacture of H_2SO_4 by contact process is

(a) H_2SO_4 (conc.) (b) H_2SO_4 (dil.)

(c) H_2SO_4 (d) $H_2S_2O_7$

19. When conc. H_2SO_4 comes in contact with sugar, it becomes black due to

(a) Hydrolysis (b) Hydration

(c) Decolourisation (d) Dehydration

20. Which one is known as oil of vitriol

(a) H_2SO_3 (b) H_2SO_4

(c) $H_2S_2O_7$ (d) $H_2S_2O_8$

21. When sulphur is boiled with Na_2SO_3 solution, the compound formed is

(a) Sodium sulphide (b) Sodium sulphate

(c) Sodium persulphate (d) Sodium thiosulphate

22. Which of the following mixture is chromic acid

(a) $K_2Cr_2O_7$ and conc. H_2SO_4

(b) $K_2Cr_2O_7$ and HCl

(c) K_2SO_4 and conc. H_2SO_4

(d) H_2SO_4 and HCl

23. The molecular formula of sulphur is

(a) S (b) S_2

(c) S_4 (d) S_8

24. H_2SO_4 acts as dehydrating agent in its reaction with

(a) $H_2C_2O_4$ (b) $Ba(OH)_2$

(c) KOH (d) Zn

25. Conc. H_2SO_4 is diluted

(a) By adding water in H_2SO_4

(b) By adding H_2SO_4 in water

(c) By adding glacial acetic acid in H_2SO_4

(d) None of the above

26. $SO_2 + H_2S \rightarrow$ product. The final product is

(a) $H_2O + S$ (b) H_2SO_4

(c) H_2SO_3 (d) $H_2S_2O_3$

27. Which of the following will not undergo hydrolysis in water

(a) Ammonium sulphate

(b) Sodium sulphate

(c) Calcium sulphate

(d) All the salts will hydrolyse

28. Hot conc. H_2SO_4 acts as moderately strong oxidising agent. It oxidises both metals and non-metals. Which of the following element is oxidised by conc. H_2SO_4 into two gaseous products

(a) Cu (b) S

(c) C (d) Zn

29. The acid in which $O-O$ bonding is present is

(a) $H_2S_2O_3$ (b) $H_2S_2O_6$

(c) $H_2S_2O_8$ (d) $H_2S_4O_6$

30. Sulphur on boiling with $NaOH$ solution gives

(a) $Na_2S_2O_3 + NaHSO_3$ (b) $Na_2S_2O_3 + Na_2S$

(c) $Na_2SO_3 + H_2S$ (d) $Na_2SO_3 + SO_2$

31. In qualitative analysis when H_2S is passed through an aqueous solution of salt acidified with dil. HCl, a black precipitate is obtained. On boiling the precipitate with dil. HNO_3, it forms a solution of blue colour. Addition of excess of aqueous solution of ammonia to this solution gives.....

(a) Deep blue precipitate of $Cu(OH)_2$

(b) Deep blue solution of $[Cu(NH_3)_4]^{2+}$

(c) Deep blue solution of $Cu(NO_3)_2$

(d) Deep blue solution of $Cu(OH)_2.Cu(NO_3)_2$

32. Which of the following is not tetrahedral in shape

(a) NH_4^+ (b) $SiCl_4$

(c) SF_4 (d) SO_4^{2-}

33. Which of the following are peroxoacids of sulphur

(a) H_2SO_5 and $H_2S_2O_8$ (b) H_2SO_5 and $H_2S_2O_7$

(c) $H_2S_2O_7$ and $H_2S_2O_8$ (d) $H_2S_2O_6$ and $H_2S_2O_7$

34. The most efficient agent for the absorption of SO_3 is

(a) 80% H_2SO_4 (b) 98% H_2SO_4

(c) 50% H_2SO_4 (d) 20% $H_2S_2O_7$

35. The oxidation number of sulphur is $+4$ in

(a) H_2S (b) CS_2

(c) Na_2SO_4 (d) Na_2SO_3

3. Halogen Family

1. Bad conductor of electricity is

(a) H_2F_2 (b) HCl

(c) HBr (d) HI

2. Which of the following is the weakest acid

(a) HF (b) HCl

(c) HBr (d) HI

3. Sea weed is employed as a source of manufacture of

(a) F (b) I

(c) Br (d) Cl

4. Aqueous solution of which of the following acids cannot be kept in a bottle of glass

(a) HF (b) HCl

(c) HBr (d) HI

5. Which one of the following is the most basic

(a) I (b) Br

(c) Cl (d) F

6. The lattice energy of the lithium halides is in the following order

(a) $LiF > LiCl > LiBr > LiI$ (b) $LiCl > LiF > LiBr > LiI$

(c) $LiBr > LiCl > LiF > LiI$ (d) $LiI > LiBr > LiCl > LiF$

7. Among Cl^-, Br^-, I^-, the correct order for being oxidise to dihalogen is **[CPMT 1999]**

(a) $I^- > Cl^- > Br^-$ (b) $Cl^- > Br^- > I^-$

(c) $I^- > Br^- > Cl^-$ (d) $Br^- > I^- > Cl^-$

8. On addition of conc. H_2SO_4 to a chloride salt, colourless fumes are evolved but in case of iodide salt, violet fumes come out. This is because

(a) H_2SO_4 reduces HI to I_2

(b) HI is of violet colour

(c) HI gets oxidised to I_2

(d) HI changes to HIO_3

9. Affinity for hydrogen decreases in the group from fluorine to iodine. Which of the halogen acids should have highest bond dissociation enthalpy

(a) HF (b) HCl

(c) HBr (d) HI

10. Reduction potentials of some ions are given below. Arrange them in decreasing order of oxidising power

Ion	ClO_4^-	IO_4^-	BrO_4^-
Reduction potential E^- / V	$E^\circ = 1.19V$	$E^\ominus = 1.65V$	$E^\ominus = 1.74V$

(a) $ClO_4^- > IO_4^- > BrO_4^-$ (b) $IO_4^- > BrO_4^- > ClO_4^-$

(c) $BrO_4^- > IO_4^- > ClO_4^-$ (d) $BrO_4^- > ClO_4^- > IO_4^-$

11. Which of the following is isoelectronic pair

(a) ICl_2, ClO_2 (b) BrO_2^-, BrF_2^+

(c) ClO_2, BrF (d) CN^-, O_3

12. Which one of the following acids is the weakest

(a) $HClO$ (b) HBr

(c) $HClO_3$ (d) HCl

13. In which case, the order of acidic strength is not correct

(a) $HI > HBr > HCl$

(b) $HIO_4 > HBrO_4 > HClO_4$

(c) $HClO_4 > HClO_3 > HClO_2$

(d) $HF > H_2O > NH_3$

14. The stability of interhalogen compounds follows the order

(a) $IF_3 > BrF_3 > ClF_3$ (b) $BrF_3 > IF_3 > ClF_3$

(c) $ClF_3 > BrF_3 > IF_3$ (d) $ClF_3 > IF_3 > BrF_3$

15. Which of the following has lowest boiling point

(a) HF (b) HCl

(c) HBr (d) HI

16. The correct order of pseudohalide, polyhalide and interhalogen are

(a) BrI_2^-, OCN^-, IF_5 (b) IF_5, BrI_2^-, OCN^-

(c) OCN^-, IF_5, BrI_2^- (d) OCN^-, BrI_2^-, IF_5

17. The reaction of the type $2X_2 + S \rightarrow SX_4$ is shown by sulphur when X is

(a) Fluorine or chlorine

(b) Chlorine only

(c) Chlorine and bromine only

(d) F, Cl, Br all

18. Which halogen forms an oxyacid that contains the halogen atom in tripositive oxidation state

(a) Fluorine (b) Chlorine

(c) Bromine (d) Iodine

19. A black compound of manganese reacts with a halogen acid to give greenish yellow gas. When excess of this gas reacts with NH_3 an unstable trihalide is formed. In this process the oxidation state of nitrogen changes from.....

(a) –3 to +3 (b) –3 to 0

(c) –3 to +5 (d) 0 to –3

20. Which of the following halogen oxides is ionic

(a) ClO_2 (b) BrO_2

(c) I_2O_5 (d) I_4O_9

21. Which of the following has the lowest solubility

(a) CaF_2 (b) $CaCl_2$

(c) $CaBr_2$ (d) CaI_2

22. The more activeness of fluorine is due to

(a) F-F bond has less energy

(b) F_2 is gas at normal temperature

(c) Its electron affinity is maximum

(d) F-F bond has more energy

23. With cold and dilute sodium hydroxide, fluorine reacts to give

(a) NaF and OF_2 (b) $NaF + O_3$

(c) O_2 and O_3 (d) $NaF + O_2$

24. The alkali metal halides are soluble in water but LiF is insoluble because

(a) It is amphoteric

(b) The $Li - F$ bond is highly ionic

(c) Its lattice energy is high

(d) Li^+ ion is least hydrated

25. Which of the following molecule is theoritically not possible

(a) OF_4 (b) OF_2

(c) SF_4 (d) O_2F_2

26. When fluoride is heated with conc. H_2SO_4 and MnO_2, the gas evolved is

(a) F_2 (b) SF

(c) HF (d) None

27. To purify fluorine gas, fumes of HF are removed by

(a) Solid NaF (b) H_2 gas

(c) Solid KHF_2 (d) None of these

28. The property which is not true about fluorine is

(a) Most of its reactions are exothermic

(b) It forms only one oxo acid

(c) Highest electronegativity

(d) High F–F bond dissociation enthalpy

29. Which of the following is most easily hydrolysed amongst the following

(a) SF_6 (b) NF_3

(c) CCl_4 (d) TeF_6

30. Chlorine cannot be used

(a) As bleaching agent

(b) In sterilisation

(c) In preparation of antiseptic

(d) For extraction of silver and copper

31. Bleaching powder is obtained by treating chlorine with

(a) CaO (b) $CaCO_3$

(c) $CaSO_4$ (d) $Ca(OH)_2$

32. Amongst $LiCl, RbCl, BeCl_2$ and $MgCl_2$. Maximum and minimum ionic character will be shown by the compounds

(a) $LiCl$, $MgCl_2$ (b) $RbCl, BeCl_2$

(c) $RbCl, MgCl_2$ (d) $MgCl_2, BeCl_2$

33. Which of the following pair has bleaching property

(a) O_3 and NO_2 (b) O_3 and H_2S

(c) SO_2 and Cl_2 (d) Cl_2 and NO_2

34. Which of the following is in the increasing order of the ionic character

(a) $PbCl_4 < PbCl_2 < CaCl_2 < NaCl$

(b) $PbCl_2 < PbCl_4 < CaCl_2 < NaCl$

(c) $PbCl_2 < PbCl_4 < NaCl < CaCl_2$

(d) $PbCl_4 < PbCl_2 < NaCl < CaCl_2$

35. SO_2 acts as temporary bleaching agent but Cl_2 acts as permanent bleaching agent. Why

(a) Cl_2 bleaches due to reduction but SO_2 due to oxidation

(b) Cl_2 bleaches due to oxidation but SO_2 due to reduction

(c) Both of these

(d) None of these

36. Which of the following is isolated in pure form

(a) $HClO_4$ (b) $HClO_3$

(c) $HClO_2$ (d) $HClO$

37. When cold $NaOH$ reacts with Cl_2 which of the following is formed

(a) $NaClO$ (b) $NaClO_2$

(c) $NaClO_3$ (d) None of these

38. $NaOCl$ is used as a bleaching agent and sterilising agent. It can be synthesized by the action of

(a) $NaCl$ with H_2O

(b) NH_4Cl with $NaOH$

(c) Cl_2 with cold and dilute $NaOH$

(d) Cl_2 with hot and concentrated $NaOH$

39. On heating $NaCl + K_2Cr_2O_7 +$ conc. H_2SO_4, the gas comes out is

(a) O_2 (b) Cl_2

(c) $CrOCl_2$ (d) CrO_2Cl_2

40. The mixture of conc. HCl and potassium chlorate on heating gives

(a) Cl_2 only (b) ClO_2 only

(c) $Cl_2 + ClO_2$ (d) $Cl_2 + ClO_2 + ClO_3$

41. Bleaching powder loses its power on keeping for a long time because

(a) It changes into calcium hypochlorate

(b) It changes into calcium chloride and calcium hydroxide

(c) It absorbs moisture

(d) It changes into calcium chloride and calcium chlorate

42. The correct order of increasing hydration energy of the following conjugate bases of oxoacids of chlorine is

(a) $ClO^- < ClO_2^- < ClO_3^- < ClO_4^-$

(b) $ClO_4^- < ClO_3^- < ClO_2^- < ClO^-$

(c) $ClO_4^- < ClO_3^- < ClO^- < ClO_2^-$

(d) $ClO_3^- < ClO_4^- < ClO_2^- < ClO^-$

43. The solubility of iodine in water increases in the presence of

(a) Alcohol (b) Chloroform

(c) Sodium hydroxide (d) Potassium iodide

44. Colour of iodine solution is disappeared by shaking it with aqueous solution of

(a) H_2SO_4 (b) Na_2S

(c) $Na_2S_2O_3$ (d) Na_2SO_4

45. In KI solution, I_2 readily dissolves and forms

(a) I^- (b) KI_2

(c) KI_2^- (d) KI_3

46. HI cannot be prepared by the action of conc. H_2SO_4 on KI because

(a) HI is stronger than H_2SO_4

(b) HI is more volatile than H_2SO_4

(c) H_2SO_4 is an oxidising agent

(d) H_2SO_4 forms complex

47. When iodine reacts with NaF, $NaBr$ and $NaCl$

(a) It gives mixture of F_2, Cl_2 and Br_2

(b) It gives chlorine

(c) It gives bromine

(d) None of these

48. If I_2 is dissolved in aqueous KI, the intense yellow species I_3^-, is formed. The structure of I_3^- ions is

(a) Square pyramidal (b) Trigonal bipyramidal

(c) Octahedral (d) Pentagonal bipyramidal

49. Ozone with dry iodine give

(a) I_4O_9 (b) I_2O_3

(c) IO_2 (d) I_2O_4

50. Iodine is released when potassium iodide reacts with

(a) $ZnSO_4$ (b) $CuSO_4$

(c) $FeSO_4$ (d) $(NH_4)_2SO_4$

51. When chlorine gas is passed through an aqueous solution of KBr, the solution turns orange brown due to the formation of

(a) KCl (b) HCl

(c) HBr (d) Br_2

52. The pK_a of oxoacids of chlorine in water follows the order

(a) $HClO < HClO_3 < HClO_2 < HClO_4$

(b) $HClO_4 < HClO_3 < HClO_2 < HClO$

(c) $HClO_4 < HClO_2 < HClO_3 < HClO$

(d) $HClO_2 < HClO < HClO_3 < HClO_4$

53. Chlorine has two naturally occurring isotopes, ^{35}Cl and ^{37}Cl. If the atomic mass of Cl is 35.45, the ratio of natural abundance of ^{35}Cl and ^{37}Cl is closest to

(a) 3.5 : 1 (b) 3 : 1

(c) 2.5 : 1 (d) 4 : 1

54. The lattice energies of $NaCl, NaF, KCl$ and $RbCl$ follow the order

(a) $KCl < RbCl < NaCl < NaF$

(b) $NaF < NaCl < KCl < RbCl$

(c) $RbCl < KCl < NaCl < NaF$

(d) $NaCl < RbCl < NaF < KCl$

4. Noble Gases

1. Electronic configuration of only one P block element is exceptional. One molecule of that element consists of how many atoms of it

(a) One (b) Two

(c) Three (d) Four

2. The noble gas which forms maximum number of compounds is

(a) Ar (b) He

(c) Xe (d) Ne

3. Which of the following gases exist more abundantly in nature than the others

(a) Helium (b) Neon

(c) Argon (d) Krypton

4. The colour discharge tubes for advertisement mainly contain

(a) Argon (b) Neon

(c) Helium (d) Xenon

5. Which one of the following noble gases is not found in the atmosphere

(a) Rn (b) Kr

(c) Ne (d) Ar

6. The forces acting between noble gas atoms are

(a) Vander Waals forces (b) Ion-dipole forces

(c) London dispersion forces (d) Magnetic forces

7. Which inert gas show abnormal behaviour on liquefaction

(a) Xe (b) He

(c) Ar (d) Kr

8. Helium is used in balloons in place of hydrogen because it is

(a) Radioactive

(b) More abundant than hydrogen

(c) Incombustible

(d) Lighter than hydrogen

9. Molecules of a noble gas do not possess vibrational energy because a noble gas

(a) Is monoatomic

(b) Is chemically inert

(c) Has completely filled shells

(d) Is diamagnetic

10. Helium is added to the oxygen supply used by deep sea divers because

(a) It is less soluble in blood than nitrogen at high pressure

(b) It is lighter than nitrogen

(c) It is readily miscible with oxygen

(d) It is less poisonous than nitrogen

11. Who among the following first prepared a stable compound of noble gas

(a) Rutherford (b) Rayleigh

(c) Ramsay (d) Neil Bartlett

12. From the knowledge of the position of radium in the periodic table, which of the following statements would you expect to be false

(a) $RaSO_4$ is insoluble in water

(b) $RaSO_4$ is insoluble in HNO_3

(c) $RaSO_4$ is a white solid

(d) $RaSO_4$ is a colourless liquid

13. Which of the following is not obtained by direct reaction of constituent elements

(a) XeF_2 (b) XeF_4

(c) XeO_3 (d) XeF_6

14. XeF_4 on partial hydrolysis produces

(a) XeF_2 (b) $XeOF_2$

(c) $XeOF_4$ (d) XeO_3

15. XeF_6 on hydrolysis gives

(a) XeO_3 (b) XeO

(c) XeO_2 (d) Xe

16. In the preparation of compounds of Xe, Bartlett had taken $O_2^+ \; Pt \; F_6^-$ as a base compound. This is because

(a) Both O_2 and Xe have same size

(b) Both O_2 and Xe have same electron gain enthalpy

(c) Both O_2 and Xe have almost same ionisation enthalpy

(d) Both Xe and O_2 are gases

17. Which of the following fluorides of Xenon is impossible

(a) XeF_6 (b) XeF_4

(c) XeF_3 (d) XeF_2

18. The numbers of lone pair(s) on Xe in XeF_2 and XeF_4 are, respectively

(a) 2 and 3 (b) 4 and 1

(c) 3 and 2 (d) 4 and 2

5. IIT-JEE/ AIEEE

1. The decreasing values of bond angles from NH_3 (106°) to SbH_3 (101°) down group-15 of the periodic table is due to **[2006]**

(a) Increasing bp-bp repulsion

(b) Increasing p-orbital character in sp^3

(c) Decreasing *lp*-bp repulsion

(d) Decreasing electronegativity

2. In which of the following arrangements the sequence is not strictly according to the property written against it **[2009]**

(a) $CO_2 < SiO_2 < SnO_2 < PbO_2$: increasing oxidising power

(b) $HF < HCl < HBr < HI$: increasing acid strength

(c) $NH_3 < PH_3 < AsH_3 < SbH_3$: increasing basic strength

(d) $B < C < O < N$: increasing first ionization enthalpy

3. Which of the following statement is wrong **[2011]**

(a) The stability of hydrides increase from NH_3 to BiH_3 in group 15 of the periodic table

(b) Nitrogen cannot form $d\pi - p\pi$ bond

(c) Single $N-N$ bond is weaker than the single $P-P$ bond

(d) N_2O_4 has two resonance structure

4. In compounds of type ECl_3, where $E = B, P, As$ or Bi, the angles $Cl-E-Cl$ for different E are in the order **[1999]**

(a) $B > P = As = Bi$ (b) $B > P > As > Bi$

(c) $B < P = As = Bi$ (d) $B < P < As < Bi$

5. Regular use of which of the following fertilizer increases the acidity of soil **[2007]**

(a) Potassium nitrate (b) Urea

(c) Superphosphate of lime (d) Ammonium sulphate

6. Which oxide of nitrogen is coloured gas **[1987]**

(a) N_2O (b) NO

(c) N_2O_5 (d) NO_2

7. What would happen when a solution of potassium chromate is treated with an excess of dilute nitric acid **[2003]**

(a) Cr^{3+} and $Cr_2O_7^{2-}$ are formed

(b) $Cr_2O_7^{2-}$ and H_2O are formed

(c) CrO_4^{2-} is reduced to +3 state of Cr

(d) CrO_4^{2-} is oxidized to +7 state of Cr

8. Nitrogen dioxide is not produced on heating **[1995]**

(a) KNO_3 (b) $Pb(NO_3)_2$

(c) $Cu(NO_3)_2$ (d) $AgNO_3$

9. Which of the following is the most suitable drying agent for ammonia gas **[2000]**

(a) Calcium oxide

(b) Anhydrous calcium chloride

(c) Phosphorus pentoxide

(d) Conc. sulphuric acid

10. Ammonium dichromate on heating gives **[1999]**

(a) Chromium oxide and ammonia

(b) Chromic acid and nitrogen

(c) Chromium oxide and nitrogen

(d) Chromic acid and ammonia

11. Which nitrogen trihalides is least basic **[1987]**

(a) NF_3 (b) NCl_3

(c) NBr_3 (d) NI_3

12. The cyanide ion, CN^- and N_2 are isoelectronic. But in contrast to CN^-, N_2 is chemically inert because of **[1992]**

(a) Low bond energy

(b) Absence of bond polarity

(c) Unsymmetrical electron distribution

(d) Presence of more number of electrons in bonding orbitals

13. Which blue liquid is obtained on reacting equimolar amounts of two gases at $-30°C$ **[2005]**

(a) N_2O (b) N_2O_3

(c) N_2O_4 (d) N_2O_5

14. $(NH_4)_2Cr_2O_7$ on heating liberates a gas. The same gas will be obtained by **[2004]**

(a) Heating NH_4NO_2

(b) Heating NH_4NO_3

(c) Treating H_2O_2 with $NaNO_2$

(d) Treating Mg_3N_2 with H_2O

15. The reaction of zinc with dilute and concentrated nitric acid, respectively, produces **[2016]**

(a) NO_2 and NO (b) NO and N_2O

(c) NO_2 and N_2O (d) N_2O and NO_2

16. Nitrogen is liberated by the thermal decomposition of only **[1991]**

(a) NH_4NO_2 (b) NaN_3

(c) $(NH_4)_2Cr_2O_7$ (d) All the three

17. Extra pure N_2 can be obtained by heating **[2011]**

(a) NH_3 with CuO (b) NH_4NO_3

(c) $(NH_4)_2Cr_2O_7$ (d) $Ba(N_3)_2$

18. The percentage of p–character in the orbitals forming P–P bonds in P_4 is **[2007]**

(a) 25 (b) 33

(c) 50 (d) 75

19. The number of hydrogen atom (s) attached to phosphorus atom in hypophosphorous acid is **[2005]**

(a) Zero (b) Two

(c) One (d) Three

20. Which is the most thermodynamically stable allotropic form of phosphorus **[2005]**

(a) Red (b) White

(c) Black (d) Yellow

21. The reaction of P_4 with X leads selectively to P_4O_6. The X is **[2009]**

(a) Dry O_2

(b) A mixture of O_2 and N_2

(c) Moist O_2

(d) O_2 in the presence of aqueous $NaOH$

22. What may be expected to happen when phosphine gas is mixed with chlorine gas **[2003]**

(a) The mixture only cools down

(b) PCl_3 and HCl are formed and the mixture warms up

(c) PCl_5 and HCl are formed and the mixture cools down

(d) $PH_3.Cl_2$ is formed with warming up

23. One mole of calcium phosphide on reaction with excess water gives **[1999]**

(a) One mole of phosphine

(b) Two moles of phosphoric acid

(c) Two moles of phosphine

(d) One mole of phosphorous pentoxide

24. The pair in which phosphorous atoms have a formal oxidation state of +3 is **[2016]**

(a) Pyrophosphorous and hypophosphoric acids

(b) Orthophosphorous and hypophosphoric acids

(c) Pyrophosphorous and pyrophosphoric acids

(d) Orthophosphorous and pyrophosphorous acids

25. The number of $P-O-P$ bonds in cyclic metaphosphoric acid is **[2000]**

(a) Zero (b) Two

(c) Three (d) Four

26. The compound that does not produce nitrogen gas by the thermal decomposition is **[2018]**

(a) NH_4NO_2 (b) $(NH_4)_2SO_4$

(c) $Ba(N_3)_2$ (d) $(NH_4)_2Cr_2O_7$

27. The smog is essentially caused by the presence of **[2004]**

(a) Oxides of sulphur and nitrogen

(b) O_2 and N_2

(c) O_2 and O_3

(d) O_3 and N_2

28. Which compound acts as an oxidising as well as reducing agent **[1991]**

(a) SO_2 (b) MnO_2

(c) Al_2O_3 (d) CrO_3

29. Amongst H_2O, H_2S, H_2Se and H_2Te the one with the highest boiling point is **[2000]**

(a) H_2O because of hydrogen bonding

(b) H_2Te because of higher molecular weight

(c) H_2S because of hydrogen bonding

(d) H_2Se because of lower molecular weight

30. Which of the following is the wrong statement **[2013]**

(a) $ONCl$ and ONO^- are isoelectronic

(b) O_3 molecule is bent

(c) Ozone is violet-black in solid state

(d) Ozone is diamagnetic gas

31. The compound which gives off oxygen on moderate heating is **[1986]**

(a) Cupric oxide (b) Mercuric oxide

(c) Zinc oxide (d) Aluminium oxide

32. Among KO_2, NO_2^-, BaO_2 and NO_2^+ unpaired electron is present in **[1997]**

(a) NO_2^+ and BaO_2 (b) KO_2 and BaO_2

(c) KO_2 only (d) BaO_2 only

33. There is no $S-S$ bond in **[1991]**

(a) $S_2O_4^{2-}$ (b) $S_2O_5^{2-}$

(c) $S_2O_3^{2-}$ (d) $S_2O_7^{2-}$

34. Hypo is used in photography because of its **[1981]**

(a) Reducing behaviour

(b) Oxidising behaviour

(c) Complex forming behaviour

(d) Reaction with light

35. Which of the following statements regarding sulphur is incorrect **[2011]**

(a) S_2 molecule is paramagnetic

(b) The vapour at $200^\circ C$ consists mostly of S_8 rings

(c) At $600^\circ C$ the gas mainly consists of S_2 molecules

(d) The oxidation state of sulphur is never less than +4 in its compounds

36. The acid having $O-O$ bond is **[2004]**

(a) $H_2S_2O_3$ (b) $H_2S_2O_6$

(c) $H_2S_2O_8$ (d) $H_2S_4O_6$

37. The number of $S-S$ bonds in sulphur trioxide trimer S_3O_9 is **[2001]**

(a) Three (b) Two

(c) One (d) Zero

38. The correct order of the thermal stability of hydrogen halides $(H-X)$ is **[2005]**

(a) $HI > HBr > HCl > HF$ (b) $HF > HCl > HBr > HI$

(c) $HCl < HF < HBr < HI$ (d) $HI > HCl < HF < HBr$

39. The following acids have been arranged in the order of decreasing acid strength. Identify the correct order

(I) $ClOH$ (II) $BrOH$ (III) IOH **[1996]**

(a) $I > II > III$ (b) $II > I > III$

(c) $III > II > I$ (d) $I > III > II$

40. Which of the following statements is true **[2006]**

(a) H_3PO_3 is a stronger acid than H_2SO_3

(b) In aqueous medium HF is a stronger acid than HCl

(c) $HClO_4$ is a weaker acid than $HClO_3$

(d) HNO_3 is a stronger acid than HNO_2

41. Which among the following is the most reactive **[2015]**

(a) Cl_2 (b) Br_2

(c) I_2 (d) ICl

42. HBr and HI reduce sulphuric acid, HCl can reduce $KMnO_4$ and HF can reduce **[1981]**

(a) H_2SO_4 (b) $KMnO_4$

(c) $K_2Cr_2O_7$ (d) None of these

43. Chlorine acts as a bleaching agent only in presence of **[1983]**

(a) Dry air (b) Moisture

(c) Sunlight (d) Pure oxygen

44. A metal, M forms chlorides in its +2 and +4 oxidation states. Which of the following statements about these chlorides is correct **[2006]**

(a) MCl_2 is more volatile than MCl_4

(b) MCl_2 is more soluble in anhydrous ethanol than MCl_4

(c) MCl_2 is more ionic than MCl_4

(d) MCl_2 is more easily hydrolysed than MCl_4

45. What products are expected from the disproportionation reaction of hypochlorous acid **[2006]**

(a) $HClO_3$ and Cl_2O (b) $HClO_2$ and $HClO_4$

(c) HCl and Cl_2O (d) HCl and $HClO_3$

46. Concentrated hydrochloric acid when kept in open air sometimes produces a cloud of white fumes. The explanation for it is that **[2003]**

(a) Concentrated hydrochloric acid emits strongly smelling HCl gas all the time

(b) Oxygen in air reacts with the emitted HCl gas to form a cloud of chlorine gas

(c) Strong affinity of HCl gas for moisture in air results in forming of droplets of liquid solution which appears like a cloudy smoke

(d) Due to strong affinity for water, concentrated hydrochloric acid pulls moisture of air towards itself. This moisture forms droplets of water and hence the cloud

47. Identify the incorrect statement among the following **[2007]**

(a) Ozone reacts with SO_2 to give SO_3

(b) Silicon reacts with $NaOH_{(aq)}$ in the presence of air to give Na_2SiO_3 and H_2O

(c) Cl_2 reacts with excess of NH_3 to give N_2 and HCl

(d) Br_2 reacts with hot and strong $NaOH$ solution to give $NaBr$, $NaBrO_4$ and H_2O

48. Concentrated H_2SO_4 cannot be used to prepare HBr from $NaBr$, because it **[1995]**

(a) Reduces HBr (b) Oxidises HBr

(c) Disproportionates HBr (d) Reacts slowly with $NaBr$

49. Concentrated HNO_3 reacts with I_2 to give **[1989]**

(a) HI (b) HOI

(c) $HOIO_2$ (d) $HOIO_3$

50. Which of the following halides is least stable and has doubtful existence **[1996]**

(a) CI_4 (b) GeI_4

(c) SnI_4 (d) PbI_4

51. The products obtained when chlorine gas reacts with cold and dilute aqueous $NaOH$ are **[2017]**

(a) ClO_2^- and ClO_3^- (b) Cl^- and ClO^-

(c) Cl^- and ClO_2^- (d) ClO^- and ClO_3^-

52. Argon is used in arc welding because of its **[2007]**

(a) Low reactivity with metal

(b) Ability to lower the melting point of metal

(c) Flammability

(d) High calorific value

53. Which one of the following statements regarding helium is incorrect **[2004]**

(a) It is used to produce and sustain powerful superconducting magnets

(b) It is used as a cryogenic agent for carrying out experiments at low temperatures

(c) It is used to fill gas balloons instead of hydrogen because it is lighter and non-inflammable

(d) It is used in gas-cooled nuclear reactors

54. Which inert gas have highest boiling point **[2015]**

(a) Xe (b) Ar

(c) Kr (d) He

55. XeF_4 and XeF_6 are expected to be **[2007]**

(a) Oxidizing (b) Reducing

(c) Unreactive (d) Strongly basic

56. In XeF_2, XeF_4, XeF_6 the number of lone pairs on Xe is respectively **[2002]**

(a) 2, 3, 1 (b) 1, 2, 3

(c) 4, 1, 2 (d) 3, 2, 1

57. Total number of lone pair of electrons in $XeOF_4$ is **[2004]**

(a) 0 (b) 1

(c) 2 (d) 3

58. The shape of XeO_2F_2 molecule is **[2012]**

(a) Trigonal bipyramidal (b) Square planar

(c) Tetrahedral (d) See-saw

59. Which one of the following reactions of Xenon compounds is not feasible **[2009]**

(a) $XeO_3 + 6HF \rightarrow XeF_6 + 3H_2O$

(b) $3XeF_4 + 6H_2O \rightarrow 2Xe + XeO_3 + 12HF + 1.5O_2$

(c) $2XeF_2 + 2H_2O \rightarrow 2Xe + 4HF + O_2$

(d) $XeF_6 + RbF \rightarrow Rb[XeF_7]$

6. NEET/ AIPMT/ CBSE-PMT

1. The basic character of hydrides of the *V*-group elements decreases in the order **[1996]**

(a) $SbH_3 > PH_3 > AsH_3 > NH_3$

(b) $NH_3 > SbH_3 > PH_3 > AsH_3$

(c) $NH_3 > PH_3 > AsH_3 > SbH_3$

(d) $SbH_3 > AsH_3 > PH_3 > NH_3$

2. Which of the following is the most basic oxide **[2006]**

(a) Bi_2O_3 (b) SeO_2

(c) Al_2O_3 (d) Sb_2O_3

3. Which of the following is not known **[1989]**

(a) NCl_5 (b) NI_3

(c) $SbCl_3$ (d) NCl_3

4. Which of the following oxide is least acidic **[1996]**

(a) P_4O_6 (b) P_4O_{10}

(c) As_4O_6 (d) As_4O_{19}

5. Which of the following oxide of nitrogen is the anhydride of HNO_3 **[1989, 91, 99]**

(a) NO (b) N_2O_3

(c) N_3O_4 (d) N_2O_5

6. Concentrated nitric acid oxidises cane sugar to **[1991]**

(a) CO_2 and H_2O (b) CO and H_2O

(c) CO, CO_2 and H_2O (d) Oxalic acid and water

7. The product obtained as a result of a reaction of nitrogen with CaC_2 is **[2016]**

(a) $CaCN_2$ (b) $CaCN$

(c) $CaCN_3$ (d) Ca_2CN

8. Pure N_2 gas is obtained from **[1991]**

(a) $NH_3 + NaNO_2$ (b) $NH_4Cl + NaNO_2$

(c) $N_2O + Cu$ (d) $(NH_4)_2Cr_2O_7$

9. Strong reducing behaviour of H_3PO_2 is due to **[2015]**

(a) Presence of one $-OH$ group and two $P-H$ bonds

(b) High electron gain enthalpy of phosphorus

(c) High oxidation state of phosphorus

(d) Presence of two $-OH$ groups and one $P-H$ bond

10. Each of the following is true for white and red phosphorus except that they **[1989]**

(a) Are both soluble in CS_2

(b) Can be oxidised by heating in air

(c) Consists of same kind of atoms

(d) Can be converted into one another

11. P_2O_5 is heated with water to give **[1991]**

(a) Hypophosphorus acid (b) Orthophosphorus acid

(c) Hypophosphoric acid (d) Orthophosphoric acid

12. PCl_3 reacts with water to form **[1991]**

(a) PH_3 (b) H_3PO_3, HCl

(c) $POCl_3$ (d) H_3PO_4

13. Red phosphorus is less reactive than yellow phosphorus because **[1999]**

(a) Its colour is red

(b) It is highly polymerised

(c) It is hard

(d) It is insoluble in C_2H_5OH

14. $PH_4I + NaOH$ forms **[1991]**

(a) PH_3 (b) NH_3

(c) P_4O_6 (d) P_4O_{10}

15. Which of the following statements is not valid for oxoacids of phosphorus **[2012]**

(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 $P=O$ unit and one $P\text{-}OH$ group

16. How many bridging oxygen atoms are present in P_4O_{10} **[2010]**

(a) 6 (b) 4

(c) 2 (d) 5

17. Which is the correct statement for the given acids **[2016]**

(a) Phosphinic acid is a diprotic acid while phosphonic acid is a monoprotic acid

(b) Phosphinic acid is a monoprotic acid while phosphonic acid is a diprotic acid

(c) Both are triprotic acids

(d) Both are diprotic acids

18. When orthophosphoric acid is heated to $600^\circ C$, the product formed is **[1989]**

(a) Phosphine, PH_3

(b) Phosphorus pentoxide, P_2O_5

(c) Phosphorus acid, H_3PO_3

(d) Metaphosphoric acid, HPO_3

19. Which oxide of nitrogen is not a common pollutant introduced into the atmosphere both due to natural and human activity **[2018]**

(a) N_2O_5 (b) NO_2

(c) N_2O (d) NO

20. Match **List I** (substances) with **List II** (process) employed in the manufacture of the substances and select the correct option

	List I		**List II**
	Substances		**Processes**
A.	Sulphuric acid	(i)	Haber's Process
B.	Steel	(ii)	Bessemer's Process
C.	Sodium hydroxide	(iii)	Leblanc Process
D.	Ammonia	(iv)	Contact Process

[2010]

(a) A(i), B(iv), C(ii), D(iii) (b) A(i), B(ii), C(iii), D(iv)

(c) A(iv), B(iii), C(ii), D(i) (d) A(iv), B(ii), C(iii), D(i)

21. Which of the following bonds has the highest energy **[1996]**

(a) $Se-Se$ (b) $Te-Te$

(c) $S-S$ (d) $O-O$

22. It is possible to obtain oxygen from air by fractional distillation because **[1989]**

(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

23. Oxygen does not react with **[1989]**

(a) P (b) Na

(c) S (d) Cl

24. Mark the oxide which is amphoteric in character **[2011]**

(a) CO_2 (b) SiO_2

(c) SnO_2 (d) CaO

25. Nitrogen dioxide and sulphur dioxide have some properties in common. Which property is shown by one of these compounds, but not by the other **[2015]**

(a) Is a reducing agent

(b) Is soluble in water

(c) Is used as a food-preservative

(d) Form 'acid-rain'

26. The gases respectively absorbed by alkaline pyrogallol and oil of cinnamon is **[1989]**

(a) O_3, CH_4 (b) O_2, O_3

(c) SO_2, CH_4 (d) N_2O, O_3

27. Which would quickly absorb oxygen **[1992]**

(a) Alkaline solution of pyrogallol

(b) Conc. H_2SO_4

(c) Lime water

(d) Alkaline solution of $CuSO_4$

28. Copper turnings when heated with concentrated sulphuric acid will give **[2000]**

(a) SO_2 (b) SO_3

(c) H_2S (d) O_2

29. Oleum is **[1991]**

(a) Castor oil (b) Oil of vitriol

(c) Fuming H_2SO_4 (d) None of them

30. In the preparation of sulphuric acid, V_2O_5 is used in the reaction, which is **[PMT 2001]**

(a) $S + O_2 \rightarrow SO_2$ (b) $2SO_2 + O_2 \rightarrow 2SO_3$

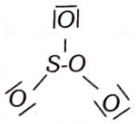
(c) $SO_2 + H_2O \rightarrow H_2SO_3$ (d) $N_2 + 3H_2 \rightarrow 2NH_3$

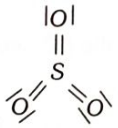
31. Roasting of sulphides gives the gas X as a by product. This is colourless gas with choking smell of burnt sulphur and causes great damage to respiratory organs as a result of acid rain. If aqueous solution is acidic, acts as reducing agent and its acid has never been isolated. The gas X is **[2013]**

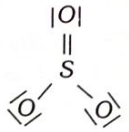
(a) SO_3 (b) H_2S

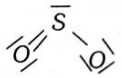
(c) SO_2 (d) CO_2

32. Which of the following structures is the most preferred and hence of lowest energy for SO_3 **[2011]**

(a) 

(b) 

(c) 

(d) 

33. In which pair of ions both the species contain S–S bond **[2017]**

(a) $S_2O_7^{2-}, S_2O_3^{2-}$ (b) $S_4O_6^{2-}, S_2O_3^{2-}$

(c) $S_2O_7^{2-}, S_2O_8^{2-}$ (d) $S_4O_6^{2-}, S_2O_7^{2-}$

34. Which of the following will not occur **[2002]**

(a) $Fe + H_2SO_4 \rightarrow FeSO_4 + H_2$

(b) $Cu + 2AgNO_3 \rightarrow Cu(NO_3)_2 + 2Ag$

(c) $2KBr + I_2 \rightarrow 2KI + Br_2$

(d) $CuO + H_2 \rightarrow Cu + H_2O$

35. Which of the following statements is not true **[2003]**

(a) HF is a stronger acid than HCl

(b) Among halide ions, iodide is the most powerful reducing agent

(c) Fluorine is the only halogen that does not show a variable oxidation state

(d) $HOCl$ is a stronger acid than $HOBr$

36. Which one of the following orders is not in accordance with the properly stated against it **[2006, 08]**

(a) $F_2 > Cl_2 > Br_2 > I_2$: Electronegativity

(b) $F_2 > Cl_2 > Br_2 > I_2$: Bond dissociation energy

(c) $F_2 > Cl_2 > Br_2 > I_2$: Oxidising power

(d) $HI > HBr > HCl > HF$: Acidic property in water

37. Which one of the following oxides is expected to exhibit paramagnetic behaviour **[2005]**

(a) CO_2 (b) SO_2

(c) ClO_2 (d) SiO_2

38. Which one of the following orders is correct for the bond dissociation enthalpy of halogen molecules **[2016]**

(a) $I_2 > Br_2 > Cl_2 > F_2$ (b) $Cl_2 > Br_2 > F_2 > I_2$

(c) $Br_2 > I_2 > F_2 > Cl_2$ (d) $F_2 > Cl_2 > Br_2 > I_2$

39. Which of the statements given below is incorrect **[2015]**

(a) Cl_2O_7 is an anhydride of perchloric acid

(b) O_3 molecule is bent

(c) ONF is isoelectronic with O_2N^-

(d) OF_2 is an oxide of fluorine

40. The variation of the boiling point of the hydrogen halides is in the order $HF > HI > HBr > HCl$. What explains the higher boiling point of hydrogen fluoride **[2015]**

(a) The electronegativity of fluorine is much higher than for other elements in the group

(b) There is strong hydrogen bonding between HF molecules

(c) The bond energy of HF molecules is greater than in other hydrogen halides

(d) The effect of nuclear shielding is much reduced in fluorine which polarizes the HF molecule

41. Which of the following is used in the preparation of chlorine **[1999]**

(a) Only MnO_2

(b) Only $KMnO_4$

(c) Both MnO_2 and $KMnO_4$

(d) Either MnO_2 or $KMnO_4$

42. Which one of the following is present as an active ingredient in bleaching powder for bleaching action **[2011]**

(a) $CaCl_2$ (b) $CaOCl_2$

(c) $Ca(OCl)_2$ (d) CaO_2Cl

43. Bromine is liberated when an aqueous solution of potassium bromide is treated with **[1989]**

(a) Cl_2 (b) I_2

(c) Dilute H_2SO_4 (d) SO_2

44. In the manufacture of bromine from sea water, the mother liquor containing bromides is treated with **[1992]**

(a) CO_2 (b) Cl_2

(c) I_2 (d) SO_2

45. A one litre flask is full of brown bromine vapour. The intensity of brown colour of vapour will not decrease appreciably on adding to the flask some **[1998]**

(a) Pieces of marble (b) Carbon disulphide

(c) Carbon tetrachloride (d) Animal charcoal powder

46. When thiosulphate ion is oxidised by iodine, which one of the following ion is produced **[1996]**

(a) SO_3^{2-} (b) SO_4^{2-}

(c) $S_4O_6^{2-}$ (d) $S_2O_6^{2-}$

47. Which of the following pairs of compounds is isoelectronic and isostructural **[2017]**

(a) $BeCl_2, XeF_2$ (b) TeI_2, XeF_2

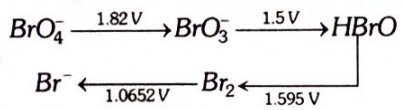
(c) IBr_2^-, XeF_2 (d) IF_3, XeF_2

48. $HgCl_2$ and I_2 both when dissolved in water containing I^- ions the pair of species formed is **[2017]**

(a) HgI_2, I_3^- (b) HgI_2, I^-

(c) HgI_4^{2-}, I_3^- (d) Hg_2I_2, I^-

49. Consider the change in oxidation state of bromine corresponding to different *emf* values as shown in the diagram below



Then the species undergoing disproportionation is **[2018]**

(a) BrO_3^- (b) BrO_4^-

(c) Br_2 (d) $HBrO$

50. Which of the following statements is not true for halogens **[2018]**

(a) All form monobasic oxyacids

(b) All are oxidizing agents

(c) All but fluorine show positive oxidation states

(d) Chlorine has the highest electron – gain enthalpy

7. AIIMS

1. Which is the most explosive **[1996]**

(a) NCl_3 (b) PCl_3

(c) $AsCl_3$ (d) All of these

2. Which of the following oxides of nitrogen is the anhydride of nitrous acid **[1991]**

(a) NO (b) N_2O_3

(c) N_2O_4 (d) N_2O_5

3. Which one has the highest percentage of nitrogen **[1996]**

(a) Urea (b) Ammonium sulphate

(c) Ammonium nitrate (d) Calcium nitrate

4. The element which forms oxides in all oxidation states +1 to +5 is **[2004]**

(a) N (b) P

(c) As (d) Sb

5. Which of the following compound show sublimation **[2015]**

(a) NH_4Cl (b) $CaCO_3$

(c) $BaSO_4$ (d) $CaHPO_3$

6. In the catalytic oxidation of ammonia an oxide is formed which is used in the preparation of HNO_3. This oxide is **[1996]**

(a) N_2O_5 (b) N_2O_4

(c) NO_2 (d) NO

7. The chemical formula of 'tear gas' is **[2008]**

(a) $COCl_2$ (b) CO_2

(c) Cl_2 (d) CCl_3NO_2

8. The statement true for N_3^- is **[2004]**

(a) It has a non-linear structure

(b) It is called pseudohalide

(c) The formal oxidation state of nitrogen in this anion is -1

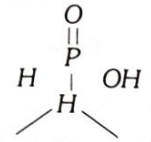
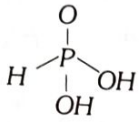
(d) It is isoelectronic with NO_2

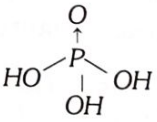
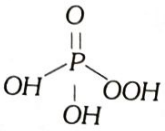
9. The *ONO* angle is maximum in **[2004]**

(a) NO_3^- (b) NO_2^-

(c) NO_2 (d) NO_2^+

10. The structural formula of hypophosphorus acid is **[2001]**

(a)  (b) 

(c)  (d) 

11. Which of the following compound is tribasic acid **[2002]**

(a) H_3PO_2 (b) H_3PO_3

(c) H_3PO_4 (d) $H_4P_2O_7$

12. The compound molecular in nature in gas phase but ionic in solid state is **[2006]**

(a) PCl_5 (b) CCl_4

(c) PCl_3 (d) $POCl_3$

13. The number of $P-O-P$ bridges in the structure of phosphorous pentoxide and phosphorous trioxide are respectively **[2005]**

(a) 6, 6 (b) 5, 5

(c) 5, 6 (d) 6, 5

14. The incorrect statement among the following is **[2006]**

(a) C_{60} is an allotropic form of carbon

(b) O_3 is an allotropic form of oxygen

(c) S_8 is only allotropic form of sulphur

(d) Red phosphorus is more sable in air than white phosphorus

15. Identify the incorrect statement with respect to ozone **[1992]**

(a) Ozone is formed in the upper atmosphere by a photochemical reaction involving dioxygen

(b) Ozone is more reactive than oxygen

(c) Ozone is diamagnetic whereas dioxygen is paramagnetic

(d) Ozone protects the earth's inhabitants by absorbing γ radiations

16. Shape of O_2F_2 is similar to that of **[2004, 15]**

(a) C_2F_2 (b) H_2O_2

(c) H_2F_2 (d) C_2H_2

17. Which of the following is not suitable for use in a desiccator to dry substances **[1996]**

(a) Conc. H_2SO_4 (b) Na_2SO_4

(c) $CaCl_2$ (d) P_4O_{10}

18. Peroxydisulphuric acid has the following bond **[2008]**

(a) $O \longleftarrow O = O$ (b) $\longleftarrow O = O \longrightarrow$

(c) $> O \longrightarrow O <$ (d) $-O-O-$

19. Which one is highest melting halide **[1980, 82]**

(a) *NaCl* (b) *NaBr*

(c) *NaF* (d) *NaI*

20. Metal halide which is insoluble in water is **[1996]**

(a) *AgI* (b) *KBr*

(c) $CaCl_2$ (d) *AgF*

21. Which of the following halogen does not exhibit positive oxidation state in its compounds **[1981, 2000]**

(a) *Cl* (b) *Br*

(c) *I* (d) *F*

22. Which is the most volatile compound **[1980]**

(a) *HF* (b) *HCl*

(c) *HBr* (d) *HI*

23. Which one is the anhydride of $HClO_4$ **[1983]**

(a) Cl_2O (b) ClO_2

(c) Cl_2O_6 (d) Cl_2O_7

24. The mixture of concentrated *HCl* and HNO_3 made in 3 : 1 ratio contains **[2003]**

(a) ClO_2 (b) *NOCl*

(c) NCl_3 (d) N_2O_4

25. Bromine water reacts with SO_2 to form **[2015]**

(a) H_2O and *HBr* (b) H_2SO_4 and *HBr*

(c) *HBr* and *S* (d) *S* and H_2O

26. Which two of the following salts are used for preparing iodized salt

(i) KIO_3 (ii) *KI*

(iii) I_2 (iv) *HI*

[2006]

(a) (i) and (ii) (b) (i) and (iii)

(c) (ii) and (iv) (d) (iii) and (iv)

27. Tincture of iodine is **[2006]**

(a) Aqueous solution of I_2

(b) Solution of I_2 in aqueous KI

(c) Alcoholic solution of I_2

(d) Aqueous solution of KI

28. Cl_2 reacts with CS_2 in presence of I_2 catalyst to form **[2015]**

(a) $CHCl_3$ (b) CCl_4

(c) C_2H_5Cl (d) C_2H_6

29. Which one of the following noble gases is the least polarizable **[1983]**

(a) Xe (b) Ar

(c) Ne (d) He

30. The correct order of solubility in water for He, Ne, Ar, Kr, Xe, is **[2002]**

(a) $He > Ne > Ar > Kr > Xe$

(b) $Ne > Ar > Kr > He > Xe$

(c) $Xe > Kr > Ar > Ne > He$

(d) $Ar > Ne > He > Kr > Xe$

31. When electric discharge is passed through neon at low pressure, the colour of the glow is **[2007]**

(a) Red (b) Green

(c) Yellow (d) Orange

32. Among the following molecule

(i) XeO_3 (ii) $XeOF_4$ (iii) XeF_6

Those having same number of lone pairs on Xe are **[2005, 15]**

(a) (i) and (ii) only (b) (i) and (iii) only

(c) (ii) and (iii) only (d) (i),(ii) and (iii)

8. Assertion and Reason

Read the assertion and reason carefully to mark the correct option out of the options given below :

(a) If both assertion and reason are true and the reason is the correct explanation of the assertion.

(b) If both assertion and reason are true but reason is not the correct explanation of the assertion.

(c) If assertion is true but reason is false.

(d) If the assertion and reason both are false.

(e) If assertion is false but reason is true.

1. Assertion : Liquid NH_3 is used for refrigeration.

Reason : Liquid NH_3 quickly vaporises. **[AIIMS 1995]**

2. Assertion : H_3PO_3 is a dibasic acid.

Reason : There are two H atoms directly attached to P. **[AIIMS 2007]**

3. Assertion : Covalency of oxygen is three.

Reason : Dinegative anion of oxygen (O^{2-}) is quite common but dinegative anion of sulphur (S^{2-}) is less common. **[AIIMS 2001]**

4. Assertion : Reaction of SO_2 and H_2S in the presence of Fe_2O_3 catalyst gives elemental sulphur.

Reason : SO_2 is a reducing agent. **[AIIMS 2005]**

5. Assertion : $SeCl_4$, does not have a tetrahedral structure.

Reason : Se in $SeCl_4$ has two lone pairs. **[AIIMS 2005]**

6. Assertion : Ozone is a powerful oxidizing agent in comparison to O_2.

Reason : Ozone is diamagnetic but O_2 is paramagnetic. **[AIIMS 2005]**

7. Assertion : Sulphur (IV) oxide can act as reducing as well as oxidising agent.

Reason : S in SO_2 has its oxidation no. $+4$ lying between -2 (minimum) and $+6$ (maximum). **[AIIMS 2015]**

8. Assertion : At room temperature, oxygen exists as a diatomic gas, whereas sulphur exists as solid.

Reason : The catenated $-O-O-O-$ chains are less stable as compared to $O=O$ molecule. **[AIIMS 2001]**

9. Assertion : Molecular nitrogen is less reactive than molecular oxygen.

Reason : The bond length of N_2 is shorter than that of oxygen. **[BHU 2006]**

10. Assertion : N_2H_4 cannot reduce $S_2O_3^{2-}$.

Reason : $S_2O_3^{2-}$ is converted to $S_4O_6^{2-}$. **[MP PMT 2008]**

11. Assertion : Sb_2S_3 is not soluble in yellow ammonium sulphide.

Reason : The common ion effect due to S^{2-} ions reduces the solubility of Sb_2S_3. **[AIIMS 2006]**

12. Assertion : The cyanide radical is a pseudo halide.

Reason : The cyanide radical undergoes reactions similar to those of halide. **[MP PMT 2008]**

13. Assertion : Chlorine and sulphur dioxide both are bleaching agents.

Reason : The bleaching action of chlorine and sulphur dioxide is performed through the process of oxidation. **[AIIMS 2000]**

14. Assertion : Halogens do not occur in free state.

Reason : Halogens are highly reactive. **[AIIMS 1994]**

15. Assertion : Halogens absorb visible light.

Reason : All halogens are coloured. **[AIIMS 2002]**

16. Assertion : $F-F$ bond in F_2 molecule is strong.

Reason : F atom is small in size. **[AIIMS 2007]**

17. Assertion : Chlorine has higher electron affinity than fluorine.

Reason : Chlorine is a poor oxidising agent than fluorine. **[AIIMS 2007]**

18. Assertion : Xenon forms fluorides.

Reason : Due to the strong electronegativity of fluorine. **[AIIMS 2001]**

19. Assertion : The fluorine has lower reactivity.

Reason : $F-F$ bond has low bond dissociation energy. **[AIIMS 2002]**

20. Assertion : Inert gases are monoatomic.

Reason : Inert gases have stable configuration. **[AIIMS 1999]**

24. The p -Block Elements (Nitrogen, Oxygen, Halogen and Noble Family) – Answers Keys

1. Nitrogen Family

1	d	2	d	3	b	4	a	5	a
6	a	7	d	8	a	9	b	10	c
11	c	12	b	13	b	14	d	15	b
16	a	17	b	18	b	19	a	20	d
21	b	22	b	23	d	24	a	25	a
26	b	27	a	28	a	29	a	30	d
31	d	32	b	33	d	34	a	35	d
36	b	37	c	38	a	39	c	40	b
41	a	42	c	43	c	44	a	45	a
46	a	47	c	48	a	49	b	50	b
51	a	52	a	53	c	54	c	55	c
56	d	57	c	58	b	59	c	60	a
61	c	62	d	63	c	64	d	65	c
66	a	67	a						

2. Oxygen Family

1	d	2	c	3	b	4	d	5	c
6	c	7	d	8	a	9	b	10	a
11	c	12	b	13	a	14	c	15	a
16	c	17	a	18	d	19	d	20	b
21	d	22	a	23	d	24	a	25	b
26	a	27	b	28	c	29	c	30	b
31	b	32	c	33	a	34	b	35	d

3. Halogen Family

1	a	2	a	3	b	4	a	5	a
6	a	7	c	8	c	9	a	10	c
11	b	12	a	13	b	14	a	15	b
16	d	17	a	18	b	19	a	20	d
21	a	22	a	23	a	24	c	25	a
26	c	27	a	28	d	29	d	30	d
31	d	32	b	33	c	34	a	35	b
36	a	37	a	38	c	39	d	40	c
41	d	42	a	43	d	44	c	45	d
46	c	47	d	48	b	49	a	50	b
51	d	52	b	53	b	54	c		

4. Noble Gases

1	a	2	c	3	c	4	b	5	a
6	a	7	b	8	c	9	a	10	a
11	d	12	c	13	c	14	b	15	a
16	c	17	c	18	c				

5. IIT-JEE/AIEEE

1	d	2	c	3	a	4	b	5	d
6	d	7	b	8	a	9	a	10	c
11	a	12	b	13	b	14	a	15	d
16	d	17	d	18	d	19	b	20	c
21	b	22	b	23	c	24	d	25	c
26	b	27	a	28	a	29	a	30	a
31	b	32	c	33	d	34	c	35	d

36	c	**37**	d	**38**	b	**39**	a	**40**	d
41	d	**42**	d	**43**	b	**44**	c	**45**	d
46	b	**47**	d	**48**	b	**49**	c	**50**	d
51	b	**52**	a	**53**	c	**54**	a	**55**	a
56	d	**57**	b	**58**	d	**59**	a		

6. NEET/ AIPMT/ CBSE-PMT

1	c	**2**	a	**3**	a	**4**	c	**5**	d
6	d	**7**	a	**8**	b	**9**	a	**10**	a
11	d	**12**	b	**13**	b	**14**	a	**15**	b
16	a	**17**	b	**18**	d	**19**	a	**20**	d
21	c	**22**	c	**23**	d	**24**	c	**25**	c
26	b	**27**	a	**28**	a	**29**	c	**30**	b
31	c	**32**	b	**33**	b	**34**	c	**35**	a
36	b	**37**	c	**38**	b	**39**	d	**40**	b
41	c	**42**	c	**43**	a	**44**	b	**45**	a
46	c	**47**	c	**48**	c	**49**	c	**50**	a

7. AIIMS

1	a	**2**	b	**3**	a	**4**	a	**5**	a
6	d	**7**	d	**8**	b	**9**	d	**10**	a
11	c	**12**	a	**13**	a	**14**	c	**15**	d
16	b	**17**	b	**18**	d	**19**	c	**20**	a
21	d	**22**	b	**23**	d	**24**	b	**25**	b
26	a	**27**	c	**28**	b	**29**	d	**30**	c
31	a	**32**	d						

8. Assertion & Reason

1	a	**2**	c	**3**	e	**4**	b	**5**	c
6	b	**7**	a	**8**	a	**9**	b	**10**	b
11	d	**12**	a	**13**	c	**14**	a	**15**	a
16	e	**17**	b	**18**	a	**19**	e	**20**	a