GGSRDN

Educational Services Private Limited

9th, 10th, NEET, JEE(Main/Advanced)

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GGSRDN

DPP

FOR CLASS 12th

Set Your Target and Keep Try in Until You Reach It.

DPP 1 TO 65

ANSWER KEY

PHYSICAL CHEMISTRY

DPP No. # 1

1.	(D)	**2.**	(A)	**3.**	(D)	**4.**	(C)		
5.*	(A,B,D)	**6.***	(A,C,D)	**7.**	3	**8.**	(A)	**9.**	(A)
10.	(B)								

DPP No. # 2

1.	(B)	**2.**	(C)	**3.**	(C)	**4*.**	(ABE)
5*.	(ABD)	**6*.**	(BCD)	**7*.**	(ACD)	**8.**	440 mm of Hg.

10. [A – q, r] ; [B – s] ; [C – p] ; [D – q].

DPP No. # 3

1.	(D)	**2.**	(C)	**3.**	(C)	**4.**	(C)	**5.**	(D)
6.	(C)	**7.***	(ABC)	**8.***	(ABC)	**9.**	4		

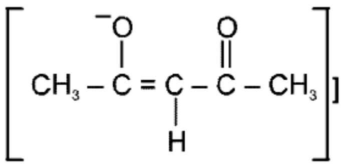
10. [A – p] ; [B – q,r] ; [C – p] ; [D – r,s].

DPP No. # 4

1.	(B)	**2.**	(C)	**3.**	(A)	**4.**	(D)	**5.**	(C)
6.	0.9247, 27.796 g/mole.			**7.**	M = 24,600	**8.**	(C)	**9.**	(D)
10.	(B)	**11.**	(B)	**12.**	(D)				

DPP No. # 5

1.	C	**2.**	A	**3.**	C	**4.**	D

5. (a) Sodium pentacyanido-C-nitrosoniumferrate(II) (Sodium nitroprusside-diamagnetic)
(b) Bis (dimethylglyoximato) nickel (II)
(c) Ammonium dinitrosyltetrathiocyanato-S chromate (III)
(d) Diaquadiiodidodinitrito-O palladium (IV)
(e) Tetraamminechloridothiocyanato-N cobalt (III) ion
(f) Potassium tetraoxidoferrate (IV)
(g) Potassium tetraazidocobaltate (II) [N_3^- is azide]
(h) Dichloridobis(triphenylphosphine) nickel (II)
(i) Tris(acetylacetonato)chromium (III) [(acac)$^-$ is ]
(j) Tetrakis(pyridine)platinum(II) tetrachloridoplatinate (II)

6. (a) $Fe^{2+} + 6H_2O + Cl^- \longrightarrow [Fe(H_2O)_6]^{2+}\ Cl^-$
Cation is a complex ion and carries + 2 charge, hence its structure is
$[Fe^{II}(H_2O)_6]Cl_2$
Oxidation state of the metal ion has been given in the structure. Students may omit it.

(b) $\underset{\text{cation}}{K^+} + Ag^{3+} + 4F^- \longrightarrow K^+\ [AgF_4]^-$
anion is a complex $K^+\ [Ag^{III}F_4]^-$

(c) $[Ti^{II}Cl_5]^{3-}$ (d) $[Co^{III}(NH_3)_4Cl_2]Cl$
(e) $[Ag^{I}(CN)_2]^-$ (f) $[Ni(NH_3)_2Cl_4]^{2-}$

(g) $[Cu^{II}(en)_3]SO_4$ (h) $Na[Al^{III}(H_2O)_2(OH)_4]$

(i) $[Cr^{III}(NH_3)Cl(en)_2]SO_4$ (j) $K_2[Zn^{II}(CN)_4]$

7. (A – p,q,r) ; (B – p,r) ; (C – p,q,r) ; (D – p,q,s,t)

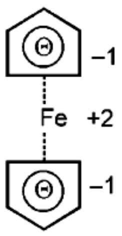
DPP No. # 6

1. D **2.** ABC

3. (a) Hexaamminecobalt(III) pentachloridocuprate(II)
(b) Hexaaquavanadium(III) chloride
(c) Ammonium tri(oxalato)cobaltate(III)
(d) Tetraamminecobalt(III)-di- μ-hydroxidobis(ethylenediamine)cobalt(III) chloride
(e) Bis (ethylenediamine) cobalt (III)-μ-imido-μ-hydroxidobis(ethylenediamine) cobalt (IV) ion
(f) Sodium hexafluoridosilicate(IV)
(g) Potassium tetraoxidochromate(VI)
(h) μ-hydroxidobis-(pentaamminechromium(III)) chloride
(i) Tris(ethylene diamine) iron (III) tetracarbonyl iron (–III) (metal in this complex can also be iron (II))
(j) Tetrachloridobis(diethylether)titanium(IV)
(k) Decacarbonyldimanganese(0)
(l) Bis(acetylacetonato)oxidovanadium(IV)
(m) Iron (III) hexacyanido-C-ferrate(II) (also called Prussian blue)

4. (a) $[Cr^{III}(NH_3)_6]_2[Cu^{II}Cl_4]_3$ (b) $[Pt^{II}Cl_2(NH_3)_2]$
(c) $[Ni^0(CO)_4]$ (d) $[Pt^{II}(NH_3)_4][Pt^{II}Cl_3NH_3]_2$
(e) $Na_3[Ag^I(S_2O_3)_2]$ (f) $K_4[Ni^0(CN)_4]$
(g) $Fe[\eta^5 - C_5H_5]_2$

η^5 means that all the five carbon atoms of cyclopentadienyl anion are coordinated to the metal ion



(h) $[Zn^{II}(NCS)_4]^{2-}$ (i) $K[Mn^{VII}O_4]$ (j) $K_3[Al^{III}(C_2O_4)_3]$ (k) $[Pt^{II}(Py)_4][Pt^{II}Cl_4]$.

5. $[Co(NH_3)_4Cl_2]Cl$ Tetramminedichloridocobalt(III) chloride.

DPP No. # 7

1.	C	**2.**	C	**3.**	D	**4.**	B	**5.**	D
6.	C	**7.**	C						

8. $Co (H_2O)_4 (NO_2)_3$ $[Co(H_2O)_3 (NO_2)_3]$. H_2O does not conduct electricity because no ion is generated in aq. sol. $[Co (H_2O)_4 (NO_2)_2] NO_2$ will conduct electricity.

9. (i) $K_4 [Fe(CN)_6]$ will produce 5 ions while $K_3 [Fe(CN)_6]$ will produce 4 ions in aq. solution. So, higher molar conductivity.
(ii) $[Pt(NH_3)_2Cl_2]$ produce no ions but $[Pt(NH_3)_6]Cl_4$ produce 5 ions in aqueous solution. So, higher molar conductivity.
(iii) $[CoCl_3(NH_3)_3]$ will not produce any ion in aq. solution. So, conductivity. is zero.

10. Electrical conductivity depends on number of ions produced.
$[Co(NH_3)_6] Cl_3 > [Co(NH_3)_5 Cl]Cl > [Co(NH_3)_3 Cl_3]$

11. $CoCl_3\ 4NH_3$
Since only one Cl^- ion is precipiteated by Ag^+ ion. This implies that only one Cl^- ion outside coordination sphere.

DPP No. # 8

1.	B	**2.**	C	**3.**	A	**4.**	C	**5.**	A
6.	**(a)** A **(b)** C	**7.**	**(a)** C **(b)** C	**8.**	B	**9.**	A	**10.**	C
11.	B	**12.**	B						

DPP No. # 9

1.	D	**2.**	B	**3.**	**(a)** C **(b)** A	**4.**	C	**5.**	B
6.	B	**7.**	D	**8.**	ABCD				

9. Stronger field ligand will split more so, more energy is required to transition of electrons from t_{2g} to e_g so, smaller wavelength light is required.

10. – 226, – 67. **11.** B **12.** B **13.** (A-p,q,r,s); (B-p,q); (C-p,q,r); (D-p,r,s)

DPP No. # 10

1.	C	**2.**	A	**3.**	D	**4.**	A	**5.**	BC
6.	ABC	**7.**	AC	**8.**	$K_f = 10^{10}$.	**9.**	C	**10.**	A
11.	D	**12.**	[A - p,q,r] ; [B - p]; [C - p,r] ; [D - s,r]			**13.**	A	**14.**	B

DPP No. # 11

1.	D	**2.**	A	**3.**	C	**4.**	ABCD	**5.**	AC
6.	A	**7.**	$[Cd^{2+}] = 1.25 \times 10^{-11}$.			**8.**	10	**9.**	6
10.	7	**11.**	(A – p, q, s) ; (B – p, r, s) ; (C – p, q) ; (D – p, s)						

DPP No. # 12

1.	B	**2.**	B	**3.**	D	**4.**	B	**5.**	BCD
6.	ABD	**7.**	4	**8.**	1	**9.**	2	**10.**	6

DPP No. # 13

1. **(a)** (B) **(b)** (A) **(c)** (C) **2.** **(a)** (A) **(b)** (A)

3. **(a)** (B) **(b)** (B) **4.** **(a)** (B) **(b)** (B)

5. **(i)** (i) HNO_2 (aq) $\rightleftharpoons$ H^+(aq) + NO_2^-(aq)

Since, HNO_2 ionises to give H^+ hence, it is a Arrhenius acid.

(ii) HNO_2(l) + H_2O(aq) $\rightleftharpoons$ H_3O^+ (aq) + NO_2^-(aq)

acid 1 base 2 acid 2 base 1

HNO_2 donates a proton hence, it is an acid and changes to NO_2^- (conjugate base). H_2O(l) accepts the proton hence, it is a base and change to H_3O^+ (conjugate acid). Thus HNO_2 is a Bronsted Lowry acid.

(ii) (a) H_2SO_4 + H_2O $\rightleftharpoons$ H_3O^+ + HSO_4^-

acid 1 base 2 acid 2 base 1 (conjugatete)

(iii) (A) to the left (B) to the right

Reaction proceed to words the side favoring formation of weak acid and weak base.

(vi) (B) **(vii)** (A)

6. (i) strongest acid,HF; weakest acid HS^-. (ii) fluoride F^-.

(iii) The strongest acid (HF) has the weakest conjugate base.

(iv) The weakest acid (HS^-) has the stongest conjugate base.

7. (i) strongest base,NH_3; weakest base C_5H_5N. (ii) $C_5H_5NH^+$.

(iii) C_5H_5N has the strongest conjugate acid, and NH_3 has the weakest conjugate acid.

8. $\sqrt{12.5}$.

DPP No. # 14

1. **(a)** (C) **(b)** (B) **2.** **(a)** (C) **(b)** (B) **3.** **(a)** (B) **(b)** (D)

4. **(a)** K_b $[CN^-] = 2 \times 10^{-5}$ **(b)** 1.8×10^{-5}

5. **(a)** $K_a = 1.56 \times 10^{-10}$ **(b)** 1.8×10^{-5} **6.** $[OH^-] = 5 \times 10^{-9}$ M **7.** 0.02.

8. (a) pH = 3.3 (b) pH = 11.2 **9.** 10^{-9}.

10. (i) $[H_3O^+] = 6 \times 10^{-4}$ M (ii) 3% ionised at 0.02 M (iii) 3.22

11. 10. **12.** 2.438 mole/litre ; 1.562 mole/litre ; 1.562 mole/litre.

DPP No. # 15

1. **(a)** (B) **(b)** (C) **2.** **(a)** (A) **(b)** (C) **3.** (C)

4. (a) 2 (b) 1.7 (c) 12 (d) 12.3 **5.** (a) $[OH^-] = [NaOH] = 10^{-4}$; (b) $[OH^-] = 5 \times 10^{-3}$ M

6. 3.75×10^{-5} moles **7.** **(a)** 1.6. **(b)** 1.7.

8. (a) 0.15 N acidic, (b) 0.133 N acidic, (c) neutral, (d) neutral, (e) 0.05 N basic, (f) neutral, (g) 0.05 N basic

9. 12.5. **10.** 4.5×10^{-5} **11.** **(a)** pH = 2.92, $K_a = 1.44 \times 10^{-5}$ **(b)** 2.5×10^{-3}

12. (a) $K_a = 10^{-8}$ (b) $K_b = 10^{-6}$

DPP No. # 16

1. **(a)** (A) **(b)** (A) **2.** (C) **3.** (A,C,D)

4. (a) pOH will increase so pH decrease (b) $[H^+]$ will decrease so pH increase (c) No change (remains same)

5. (a) pH = 11.08 (b) pH = 13 (c) $K_b = 1.44 \times 10^{-5}$ (d) will suppress it.

6. **(a)** 900 mL. **(b)** 2.37, V = 2.5×10^4 litres. **7.** $[Sac^-] = 4 \times 10^{-12}$ M

8. 4.52. **9.** $[HC_2O_4^-] = 0.06$ M, (ii) $[C_2O_4^{2-}] = 6.4 \times 10^{-7}$ M.

10. (i) $[H^+] = 0.03$ M ; (ii) $[H_2PO_4^-] = 0.03$ M ; (iii) $[HPO_4^{2-}] = 6.2 \times 10^{-8}$, (iv) $[PO_4^{3-}] = 7.44 \times 10^{-19}$

11. (i) pH = 1.1 ; (ii) $[SO_3^{2-}] = K_{a2} = 6 \times 10^{-6}$ M.

12. (i) $[OH^-] = 9 \times 10^{-5}$ M, $[N_2H_5^+] = 9 \times 10^{-5}$; (ii) pOH = 4.04, $[N_2H_6^{2+}] = 9 \times 10^{-16}$.

DPP No. # 17

1. **(a)** (B) **(b)** (A) **2.** **(a)** (D) **(b)** (B) **(c)** (C)

3. $[S^{2-}] = 2.5 \times 10^{-15}$ **4.** (i) $[H_3O^+] = 5 \times 10^{-3}$ M (ii) $[H_3O^+] = 5 \times 10^{-3}$ M.

5. $[H^+] = 6.6 \times 10^{-5}$, $[HCO_3^-] = 6.06 \times 10^{-5}$, $[CO_3^{2-}] = 4.8 \times 10^{-11}$. **6.** $C_1 = 6$ M.

7. 2×10^{-11}. **8.** pH = 10.6. **9.** $[HS^-] = 4 \times 10^{-8}$ M ; $[S^{2-}] = 2.08 \times 10^{-20}$ M.

DPP No. # 18

1. (A) **2.** (A)

3.

	K_h	pH	%Hydrolysis
(i)	5×10^{-10}	8.7	0.01%
(ii)	5×10^{-10}	5.7	0.025%
(iii)	10.0	13.68	95%
(iv)	2.5×10^{-5}	11.60	0.625%
(v)	2.5×10^{-5}	7.0	0.5%
(vi)	1.25	9.35	52.8%

4. 9.08 **5.** 2.76×10^{-5} mol Lt^{-1}. **6.** 1.44×10^{-5} M. **7.** (a) 4.92 (b) 7.56

8. 0.3 mole of C_5H_5NHCl should be added to 500 ml solution of C_5H_5N.

DPP No. # 19

1. (B) **2.** **(a)** (A) **(b)** (C) **3.** **(a)** (D) **(b)** (C) **4.** 4.52, 5.48.

5. 3.25 **6.** 2.95×10^{-6} **7.** 3.162×10^{-5} **8.** **(i)** (D) **(ii)** (B) **(iii)** (C)

9. **(i)** (D) **(ii)** (A) **(iii)** (B)

DPP No. # 20

1. **(a)** (D) **(b)** (B) **2.** (B) **3.** (B) **4.** (C)

5. 10^{-5} mol L^{-1} **6.** 1.1×10^{-12} . **7.** 0.38 gm.

8. **(i)** 1.6×10^{-5} mol/lit. **(ii)** 2.56×10^{-9} mol/lit.

9. $s = 1.5 \times 10^{-8}$ mol/l^{-1} **10.** $s = 8 \times 10^{-8}$ M. **11.** $K_{sp} = 3.2 \times 10^{-11}$, $[Ca^{2+}] = 3.2 \times 10^{-9}$ mole/litre.

12. **(i)** 4×10^{-5} mole per litre **(ii)** 1.6×10^{-8} mol per litre.

DPP No. # 21

1. (D) **2.** (B) **3.** (B) **4.** (C)

5. 4×10^{-6} M, 2×10^{-4} M, 50 times.

6. (a) Will dissolve, 32% saturation (b) will not dissolve, 100% saturation.

7. $[Ag^+] = 5 \times 10^{-7}$M , $[IO_3^-] = 2 \times 10^{-2}$M, $[K^+] = 2 \times 10^{-2}$M. **8.** 15 ml. **9.** 10^{-6} M, 10^{-10} M.

10. $K_{sp} = 5 \times 10^{-7}$. **11.** 2×10^{-3}. **12.** $[F^-] = 3 \times 10^{-3}$M. **13.** 1.1×10^{-5} M.

DPP No. # 22

1.	(A)	**2.**	(A)	**3.**	(C)	**4.**	(A)	**5.**	(C)
6.	(D)	**7.***	(B,D)	**8.***	(A,B,C,D)	**9.**	9	**10.**	5
11.	05	**12.**	True	**13.**	**(i).** (A) **(ii).** (B) **(iii).** (A)				

DPP No. # 23

1.	(A)	**2.**	(A)	**3.**	(B)	**4.**	(B)	**5.**	(B)
6.	(C)	**7.**	(C, D)	**8.**	(A,C,D)	**9.**	(3)	**10.**	4
11.	03	**12.**	(A – q,s,t) ; (B – p,q,t) ; (C – p,r) ; (D – q,s).						

DPP No. # 24

1. **(a)** (B) **(b)** (D) **(c)** (D) **2.** (D) **3.** (D)

4. (C) **5.** (D) **6.** (D) **7.** (A)

8. **(a)** (A,B,C) **(b)** (A,B,C) **(c)** (C,D) **9.** (B,C,D) **10.** 6 J/K

11. **(a)** (i) 84.41 JK^{-1} mol^{-1} ; (ii) –84.14 JK^{-1} mol^{-1} **(b)** –11.50 KJ/mol.

12. **(a)** 481 K. **(b)** $\Delta H_{min} = T\Delta S = 36.06$ KJ. **13.** $\Delta S_{total} = 4980.6$ JK^{-1} $mol^{-1} > 0$

DPP No. # 25

1.	**(a)** (B) **(b)** (D)	**2.**	(D)	**3.**	(B)	**4.**	(C)	**5.**	(B)
6.	(A)	**7.**	(C)	**8.**	(B)	**9.***	(A,B,C,D)	**10.***	(A,B,C)
11.*	(A,B,D)	**12.**	8	**13.**	$\Delta G° = 38.48$ KJ/mol ; $\Delta S° = –33.6$ JK^{-1} mol^{-1}.				

DPP No. # 26

1.	(A)	**2.**	(B)	**3.**	(A)	**4.**	(B)	**5.**	(B)
6.	(D)	**7.**	(A)	**8.**	(D)	**9.**	(B)	**10.**	(B)
11.	(A)	**12.**	(D)	**13.**	(ABC)	**14.**	(A)	**15.**	(C)

DPP No. # 27

1.	(A)	**2.**	(C)	**3.**	(A)	**4.**	(B)	**5.**	(A)
6.	(C)	**7.**	(B)	**8.**	(D)	**9.**	(B)	**10.**	(D)
11.	(A,D)	**12.**	E° = – 1.59 V, non-spontaneous			**13.**	E = – 2.4191 V.		

DPP No. # 28

1.	(B)	**2.**	(A)	**3.**	(A)	**4.**	(C)	**5.**	(C)
6.	(D)	**7.**	(B)	**8.**	(A,B,D)	**9.**	3	**10.**	5

DPP No. # 29

1. (C)

2. E°_{cell} = + 0.01 V, E_{cell} = – 0.0785 V, correct representation is $Pb|Pb^{2+}(10^{-3}\,M)||Sn^{2+}(1M)|Sn$.

3. $\log K_{eq.} = \frac{2 \times 0.777}{0.0591}$, $K_{eq.} = 2.18 \times 10^{26}$ **4.** $K_c = 1.864 \times 10^{107}$, $\Delta G^\circ = -611.8$ kJ

5. E° = 0.7826 V **6.** (C) **7.** (C) **8.** (B) **9.** 8 **10.** 5

DPP No. # 30

1.	(A)	**2.**	(B)	**3.**	(D)	**4.**	(D)	**5.**	(D)
6.	0.2204 V	**7.**	5×10^{-12}.	**8.**	$\Delta S^o = -241.45\ JK^{-1}$,		$\Delta H^o = -3.3437 \times 10^2$ kJ.		

9. (A) - p,r; (B) - q,s; (C) - p,r ; (D) - q,s **10.** (B) **11.** (B)

DPP No. # 31

1.	**(a)** (A) **(b)** (B)	**2.**	**(a)** (C) **(b)** (D)	**3.**	(B)	**4.**	(A)	**5.**	(C)
6.	(C)	**7.**	(D)	**8.**	(C)	**9.**	(A)	**10.**	(A)
11.	(A)								

DPP No. # 32

1.	(A)	**2.**	(B)	**3.**	(A)	**4.**	0.02486 Molar.		
5.	6.4×10^{-4} cm	**6.**	1.4 A.	**7.**	(A)	**8.**	(C)	**9.**	(D)
10.	(B)								

DPP No. # 33

1.	(D)	**2.**	(B)	**3.**	(B)	**4.**	(D)	**5.**	(B)
6.	(A)	**7.**	(B)	**8.**	$40\ \Omega^{-1}\ cm^2\ eq^{-1}$	**.9.**	1	**10.**	5

DPP No. # 34

1. (D) **2.** (D) **3.** (B) **4.** (D)

5. (A) → p, q, r, t ; (B) → p, q, r, t ; (C) → p, q, r, s, t ; (D) → p, q, r, t **6.** 2

7. 2 **8.** 6 **9.** $K_{SP}\ BaSO_4 = 1.167 \times 10^{-10}$ **10.** $0.69\ cm^{-1}$, 0.425.

DPP No. # 35

1.	(B)	**2.**	**(a)** (C) **(b)** (B)	**3.**	(D)	**4.**	(D)		
5.	**(a)** (A) **(b)** (D)	**6.**	(D)	**7.**	(A)	**8.**	(B,C,D)	**9.**	(A)
10.	(B)								

11. $(NH_4)_2Cr_2O_7 \longrightarrow N_2 + Cr_2O_3 + 4H_2O$

(A) (C) (B)

Orange solid

$N_2 + 3\,Mg \xrightarrow{\Delta} Mg_3N_2$ (D)

$Mg_3N_2 + 6\,H_2O \longrightarrow 3\,Mg(OH)_2 + 2\,NH_3$ (E)

$NH_3 + HCl \longrightarrow NH_4Cl$ (white fumes)

12. **(a)** (i) Nitrogen exists as a diatomic molecule with triple bond (high bond enthalpy), where as phosphoru form single bond as P–P.

(ii) Due to its small size, high electronegativity, high ionisation enthalpy and non–availability of d–orbitals

(b) (i) Nitrogen $\rightarrow p\pi-p\pi$ multiple bond (very high bond enthalpy).

(ii) In phosphorus their atomic orbitals are so large and diffuse that they cannot have effective over lapping

(c) Basic character decreases down the group as size of atom increases and thus electron density decrease leading to decrease in electron donor capacity. Due to decrease in bond (E–H) dissociation enthalpy dow the group may act as acid rather than a base.

13. **(a)** $3CaO ++ 8P + 9H_2O \longrightarrow 3Ca(H_2PO_2)_2 + 2PH_3$

(b) (a) $AlN + 3H_2O \longrightarrow Al(OH)_3 + NH_3$

(b) $P_4O_6 + 6H_2O(cold) \longrightarrow 4H_3PO_3$

$P_4O_6 + 6H_2O\ (hot) \longrightarrow 3H_3PO_4 + PH_3$

(c) $C + 4\,HNO_3 \longrightarrow CO_2 + 4\,NO_2 + 2\,H_2O$

14. **(a)** Slow oxidation in air raises its temperature and when exceeds 30°c ignition tempt. catches fire

(b) Impure sample becomes inflammable owing to the presence of P_2H_4 or P_4 vapours.

$P_4 + 5O_2 \longrightarrow P_4O_{10}$

(c) $2PH_3 \xrightarrow{\text{decomposes}} 2P\ (red) + 3H_2$

15. **(i)** 6 **(ii)** 3 **(iii)** 2

DPP No. # 36

1. (D) **2.** (A) **3.** **(a)** (C) **(b)** (D) **4.** (B) **5** (A,D)

6. (A) **7.** (D) **8.** (A)

9. (a) High interelectronic repulsion of the non–bonding electrons owing to the small bond length $(\ddot{N} \equiv \ddot{N})$.

(b) Least $\Delta_{dissociation}H(E-H)$ bond.

(c) SbH_3 higher molecular weight leading to higher vander Waal's force of attraction (by magnitude).

10. **(a)** $3\,HNO_2 \longrightarrow H\,NO_3 + H_2O + 2\,NO$

$4\,H_3PO_3 \longrightarrow 3\,H_3PO_4 + PH_3$

(b) (A) $P_4 + 8SOCl_2 \longrightarrow 4PCl_3 + 4SO_2 + S_2Cl_2$

(B) $SO_2 + PCl_5 \longrightarrow SOCl_2 + POCl_3$

11. (A – p, q, s); (B – p, q, s) ; (C – p, s); (D – r, s) **12.** (B) **13.** (A) **14.** V = 1.763 L

DPP No. # 37

1. **(a)** (D) **(b)** (D) **2.** (D) **3.** **(a)** (A) **(b)** (C) **4.** **(a)** (B) **(b)** (C) **5.** (C)

6. **(a)** (C) **(b)** (A) **7.** **(a)** (B,C,D) **(b)** (A,C,D)

8. **(a)** (B) **(b)** **S_1 : (True) ; S_2 : (false)** **9.** (D)

10. **(a)** On the basis of atomicity, oxygen diatomic where as sulphur is polyatomic.

(b) $Na_2S_2O_3 + 2H^+ \longrightarrow 2Na^+ + H_2SO_3 + S\downarrow$ (colloidal sulphur)

(c) S_2 (in vapour state) has two unpaired electrons, like O_2

11. (A - p, q); (B - p, q, r) (C - p, q, r); (D - p, q)

DPP No. # 38

1.	(A)	**2.**	(A)	**3.**	(B)	**4.**	**(a)** (D) **(b)** (C)
5.	(A,B)	**6.**	(B)	**7.**	(A)	**8.**	(B)

9. (a) $2H_3PO_2 \longrightarrow H_3PO_4 + PH_3$ (b) $P_4O_{10} + 6\ PCl_5 \longrightarrow 10POCl_3$

10. **(i)** 0 **(ii)** 4 **(iii)** 4

DPP No. # 39

1.	**(a)** (C) **(b)** (D)	**2.**	**(a)** (B) **(b)** (C) **(c)** (C)	**3.**	(A,C,D)	**4.**	(A,C)
5.	(C)	**6.**	(A)	**7.**	(B)	**8.**	**(a)** (C) **(b)** (A) **(c)** (A)
9.	**(a)** (D) **(b)** (D) **(c)** (B) **(d)** (A)	**10.**	(B)	**11.**	(A)	**12.**	(B)

13. $2KI(aq.) + Cl_2 \longrightarrow 2KCl(aq.) + I_2$
In the reaction Cl_2 oxidises iodide ion (–1 oxidation state) to I_2 (0 oxidation state). Cl_2 has higher reduction potential then I_2 and thus oxidises iodide to iodine getting itself reduced to chloride ion. Similarly,
$2KI + X_2 \longrightarrow 2KX + I_2$; (X = Cl, Br, F)

14. **(i)** 3 **(ii)** 6

DPP No. # 40

1.	**(a)** (A) **(b)** (B)	**2.**	**(a)** (D) **(b)** (A)	**3.**	(C)	**4.**	**(a)** (C) **(b)** (A)
5.	**(a)** (A) **(b)** (B) **(c)** (B)	**6.**	(C)	**7.**	(C)	**8.**	(A)

9. (A) $SiO_2 + 2F_2 \longrightarrow SiF_4 + O_2$.
(B) $Na_2S_2O_3 + H_2O + Cl_2 \longrightarrow Na_2SO_4 + 2HCl + \downarrow$
(C) $I_2 + 6H_2O + 5Cl_2 \longrightarrow 2HIO_3 + 10\ HCl$
(D) $2\ IO_3^- + 5HSO_3^- \longrightarrow 3HSO_4^- + 2SO_4^{2-} + I_2 + H_2O$
(E) $2KMnO_4 + 16HCl \longrightarrow 2KCl + 2MnCl_2 + 5Cl_2 + SH_2O$.

10. (A-p,q,r,s) ; (B-p,q,r) ; (C-q,s) ; (D-q) **11.** (A-q, s) ; (B-p) ; (C-q, r) ; (D-p, q, t) **12.** 8

DPP No. # 41

1.	(B)	**2.**	**(a)** (C) **(b)** (A)	**3.**	**(a)** (B) **(b)** (B)	**4.**	**(a)** (D) **(b)** (A)
5.	**(a)** (A) **(b)** (B)	**6.**	**(a)** (C) **(b)** (D)	**7.**	(C)	**8.**	(C)
9.	**(a)** (B) **(b)** (A)	**10.**	**(a)** (D) **(b)** (C)	**11.**	(A) - (q) ; (B) - (p) ; (C) - (s) ; (D) - (r)		

DPP No. # 42

1.	(C)	**2.**	**(a)** (C) **(b)** (B)	**3.**	(C)	**4.**	(A)	**5.**	(C)
6.	**(a)** (B) **(b)** (A)	**7.**	(A)	**8.**	(A)	**9.**	(B)		

10. P_zQ_y **11.** 8, 4, 100%. It has fluorite (CaF_2) structure. **12.** 5.6 Å, 3.95Å

13. (A) 4.5 Å, (B) 5.2, (C) 8, (D) 6, (E) 0.92 g/mL **14.** 3.09×10^{22}

DPP No. # 43

1.	(A)	**2.**	(A)	**3.**	(D)	**4.**	(C)	**5.**	(D)
6.	(A)	**7.**	(A)	**8.**	12	**9.**	$8R^3$, 52.38%	**10.**	0.53Å
11.	**(i)** 4 **(ii)** 4	**12.**	(D)	**13.**	(D)	**14.**	(B)		

DPP No. # 44

1.	(B)	**2.**	(D)	**3.**	(D)

4. AX : bcc structure, volume = 12.3 pm^3
AY : octahedral, volume = 216 pm^3

5. 2.178×10^{23}

6. Since the solid A^+B^- has NaCl type close packed structure, it belongs to a system of coordination number 6. In such case, the ratio of the cation to anion radii is given by

$$\frac{r_+}{r_-} = 0.414$$

Since $r_- = 250$ pm

$\therefore$ $r_+ = 0.414 \times 250\text{pm} = 103.5$ pm = Radius of the cation

For any tetrahedral site the ratio of cation to anion radii should be between 0.225 and 0.414

Now $\dfrac{r_+}{r_-} = \dfrac{180 \text{ pm}}{250 \text{ pm}} = 0.72$

Since this ratio does not fall within the limit, the cation C^+ having a radius of 180 pm cannot be slipped/ accommodated into the tetrahedral site of the crystal A^+B^-.

7. (a) 1.268 Å, (b) 2.537 Å, (c) 2, (d) $4/3\ \pi\ (1.268)^3$ Å^3.

8. (a) 2.878 Å, (b) 4.07, (c) 12, (d) 6, (e) 19.4, (f) 0.74 **9.** (A - p,q,t) ; (B - s) ; (C - r) ; (D - p,q,t)

10. **(i)** 4 **(ii)** Na crystallizes in bcc structure in which coordination number of each atom is 8.

11. **(a)** (B) **(b)** (b)

DPP No. # 45

1. **(a)** (B) **(b)** (A) **2.** **(a)** (D) **(b)** (A) **3.*** (B,C) **4.** (A) **5.** (C)

6. (C) **7.** **(a)** (A) **(b)** (C) **8.** 97.78 %. **9.** AB_2O_4

10. (a) MnF_3 (b) 6 (c) a = 2(1.36 + 0.65) = 4.02 Å **11.** 2.878 Å, 19.40 g /cc.

12. (i) 2.878 Å, (ii) 12, (iii) 197, (iv) 0.74 **13.** (A $\rightarrow$ q,r) ; (B $\rightarrow$ p,s) ; (C $\rightarrow$ q) ; (D $\rightarrow$ q,r)

DPP No. # 46

1.	(B)	**2.**	(D)	**3.**	(D)	**4.***	(A,B,D)	**5.***	(A,B)
6.*	(B,D)	**7.**	(B)	**8.**	(D)	**9.**	(B)	**10.**	(A)

11. (A) **12.** (A $\rightarrow$ p,q,r,t) ; (B $\rightarrow$ p,t) ; (C $\rightarrow$ q,r,t) ; (D $\rightarrow$ p,s) **13.** (A)

14. **(i)** 6Å **(ii)** 5

DPP No. # 47

1.	(D)	**2.**	(C)	**3.**	(D)	**4.**	(D)	**5.**	(C)
6.	(D)	**7.**	(D)	**8.**	(C)	**9.**	(C)	**10.**	(D)

DPP No. # 48

1.	(D)	**2.**	(B)	**3.**	(B)	**4.**	(C)	**5.**	(A)
6.	(C)	**7.**	(C)	**8.**	(D)	**9.**	(A)	**10.***	(BD)
11.*	(ABC)								

DPP No. # 49

1.	(D)	**2.**	(B)	**3.**	(D)	**4.**	(A)	**5.**	(A)
6.	(A)	**7.**	(B)	**8.**	(D)	**9.**	(B)		

10. [A – r] ; [B – q] ; [C – r] ; [D – p].

DPP No. # 50

1.	(A)	**2.**	(C)	**3.**	(A)	**4.**	(B)	**5.**	(C)
6.	(B)	**7.**	(D)	**8.**	(B)	**9.**	(D)		

10. Rate = k $[A]^1 [B]^2$, k = 5×10^{-2} M^{-2} hr^{-1} 11. t = 92.6 s.

12. $k = \frac{1}{t} \ln\left(\frac{P_0}{P_t}\right)$ 13. $k = \frac{1}{t} \ln\left(\frac{P_0}{2P_0 - P_t}\right)$ 14. $k = \frac{1}{t} \ln\left(\frac{P_\infty}{P_\infty - P_t}\right)$

DPP No. # 51

1.	(A)	**2.**	(C)	**3.**	(D)	**4.**	(B)	**5.**	(B)
6.	(A, B)	**7.**	4	**8.**	$k = \frac{1}{t} \ln\left(\frac{V_0}{V_t}\right)$	**9.**	$k = \frac{1}{t} \ln\left(\frac{V_\infty - V_0}{V_\infty - V_t}\right)$		
10.	$k = \frac{1}{t} \ln\left(\frac{V_\infty - V_0}{V_\infty - V_t}\right)$	**11.**	$k = \frac{1}{t} \ln\left(\frac{r_\infty - r_0}{r_\infty - r_t}\right)$	**12.**	3	**13.**	$k = \frac{1}{t} \ln\left(\frac{3P_\infty}{5(P_\infty - P_t)}\right)$		

DPP No. # 52

1.	(D)	**2.**	(B)	**3.**	(C)	**4.**	(D)	**5.**	(A)
6.	(A)	**7.**	(B)	**8.**	(B)	**9.**	(A)	**10.**	K_C = 36.6

DPP No. # 53

1.	(A)	**2.**	(A)	**3.**	(D)	**4.**	(D)	**5.***	(BC)
6.	(AB)	**7.**	$k = k_3K_2\sqrt{K_1}$	**8.**	$\frac{dC_D}{dt} = K_1C_A + K_3C_B - K_2 C_D - K_4C_D$.				
9.	1.25×10^{-3} Ms^{-1}			**10.**	1^{st} order , 73%.				

DPP No. # 54

1.	(A)	**2.**	(B)	**3.**	(D)	**4.**	(A)	**5.**	(C)
6.	(A)	**7.**	2.	**8.**	K = 5.25 sec^{-1}.				

9. $k_1 = \frac{1}{90}\ln(2.5)min^{-1}$; $k_2 = \frac{1}{45}\ln(2.5)min^{-1}$. **10.** (A – p,s) ; (B – r, s) ; (C – q, s) ; (D – s)

DPP No. # 55

1.	**(a)** (B) **(b)** (B)	**2.**	**(a)** (D) **(b)** (B)	**3.**	**(a)** (A) **(b)** (B)	**4.**	**(a)** (C) **(b)** (A)
5.	**(a)** (A) **(b)** (C)	**6.**	**(a)** (A) **(b)** (B)	**7.**	**(a)** (C) **(b)** (A)	**8.**	(A - s, t) ; (B - p) ; (C - q, t) ; (D - r)

DPP No. # 56

1.	(B)	**2.**	(B)	**3.**	(C)	**4.**	(C)	**5.**	(A)
6.	(C)	**7.***	(ABCD)	**8.**	(B)	**9.**	(A)	**10.**	(B)
11.	(A)	**12.**	(A $\rightarrow$ p,q, r) ; (B $\rightarrow$ p, q, r) ; (C $\rightarrow$ q, s) ; (D $\rightarrow$ r).						

DPP No. # 57

1.	(A)	**2.**	(D)	**3.**	(B)	**4.**	(C)	**5.**	(B)
6.	(C)	**7.**	(A)	**8.**	(A)	**9.**	(C)	**10.**	(C)
11.	(B)	**12.**	(D)	**13.**	(A)	**14.**	(C)		

DPP No. # 58

1.	**(a)** (C) **(b)** (A)	**2.**	**(a)** (D) **(b)** (D)	**3**	**(a)** (D) **(b)** (A)	**4**	**(a)** (C) **(b)** (C)		
5	**(a)** (C) **(b)** (C)	**6.**	(C)	**7.***	(ABCD)	**8.**	(A)	**9.**	(B)
10.	6.	**11.**	4	**12.**	6				

DPP No. # 59

1	**(a)** (D) **(b)** (A)	**2**	**(a)** (D) **(b)** (A)	**3**	**(a)** (B) **(b)** (B)	**4**	**(a)** (B) **(b)** (D)		
5.	(C)	**6.**	(B)	**7.**	(D)	**8.**	(B)	**9.**	6
10.	2	**11.**	3	**12.**	2				

DPP No. # 60

1.*	(ABD)	**2.**	(B)	**3.**	(D)	**4.**	(A)	**5.**	(C)
6.	(B)	**7.**	(A)	**8.**	(B)	**9.**	(B)	**10.**	(D)
11.	(C)	**12.**	(B)						

DPP No. # 61

1.	(A)	**2.**	(D)	**3.**	(C)	**4.**	(C)	**5.**	(A)
6.	(C)	**7.**	(C)	**8.**	(C)	**9.**	(D)	**10.**	(B)
11.	(C)								

DPP No. # 62

1. $BeCl_2$ is hydrolysed due to high polarising power and presence of vacant p-orbitals in Be-atom. (Be = $1s^2$,$2s^2 2p_x^1\ 2p_y^0 2p_z^0$)

2. (i) Na_2O_2 is powerful oxidant and bleaching agent and bleaches red litmus paper to white in aqueous solution according to the following reaction,

$$Na_2O_2 + 2H_2O \longrightarrow 2NaOH + H_2O + [O]$$
$$[O] + \text{Litmus} \longrightarrow \text{White (bleaching)}$$

(ii) The other compound Na_2O will give NaOH on dissolution in water according to the following reaction.

$$Na_2O + H_2O \longrightarrow 2NaOH\ .$$

The red litmus will turn to blue due to stronger alkaline nature of NaOH

3. (C) **4.*** (AB) **5.** $SrSO_4 > CaSO_4 > MgSO_4 > BeSO_4$

6. Lower the size of cation, higher will be hydration tendency because hydration energy of cation is inversely proportional to size of cation. The size of alkaline earth metal ions are lower than the size of alkali metal ions. So in crystalline form the salts of alkaline earth metals have more water molecules than those of alkali metals.

7. Ba, Ba_3N_2, $Ba(OH)_2$ $BaCO_3$

8.	(A)	**9.**	(B)	**10.**	(A)	**11.**	(A)	**12.**	(D)

DPP No. # 63

1.	(C)	**2.**	(B)	**3.**	(D)	**4.**	(A)	**5.**	(B)
6.	(C)	**7.**	(ABCD)	**8.**	(C)	**9.**	(D)	**10.**	(B)

DPP No. # 64

1.	(A)	**2.**	(A)	**3.**	(D)	**4.**	(D)	**5.**	(A)
6.	(CD)	**7.**	(BD)	**8.**	(BC)	**9.**	(AB)	**10.**	(D)
11.	(A)	**12.**	(A)	**13.**	(A)				

14. (A – p,t,r); (B - p,s,t,r) ; (C- p,q,r,t) ; (D- p,q,r,t)

DPP No. # 65

1.	**(a)** (D) **(b)**		(D)	**2.**	(A)	**3.**	(D)	**4.**	(C)
5.	(C)	**6.**	(C)	**7.**	(D)	**8.**	(A)	**9.**	(C)
10.	(B)	**11.**	(A)	**12.**	(D)	**13.**	(C)	**14.**	(C)

15. (A– r, t); (B – p, q, r, s, t) ; (C – p, q, s, r) ; (D – p, q, s, r)