ALLEN CAREER INSTITUTE KOTA (RAJASTHAN)
path to success

DISTANCE LEARNING PROGRAMME
(Academic Session : 2019 - 2020)

LEADER TEST SERIES / JOINT PACKAGE COURSE

TARGET : PRE-MEDICAL 2020

Test Type : Unit Test Test # 02 Test Pattern : NEET-UG

TEST DATE : 21 - 07 - 2019

ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	2	3	3	4	3	3	3	2	3	1	4	2	1	2	2	2	2	4	3	4
Que.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	4	3	3	2	1	3	1	3	1	3	2	1	3	4	4	4	2	4	2	2
Que.	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
Ans.	3	4	2	4	4	2	4	4	1	3	4	3	1	4	3	4	2	2	4	2
Que.	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80
Ans.	2	2	4	4	2	3	3	4	2	3	1	1	1	1	1	2	4	1	1	4
Que.	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98	99	100
Ans.	3	3	4	4	2	2	4	4	1	1	3	4	3	1	2	2	2	4	1	2
Que.	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120
Ans.	2	1	4	3	3	4	3	2	2	2	1	4	3	1	3	1	1	1	1	4
Que.	121	122	123	124	125	126	127	128	129	130	131	132	133	134	135	136	137	138	139	140
Ans.	4	2	3	2	4	1	1	2	2	3	2	2	2	3	1	3	1	1	3	3
Que.	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
Ans.	2	1	2	3	4	2	1	4	1	3	3	2	1	1	2	4	4	3	4	2
Que.	161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180
Ans.	2	3	3	1	4	3	1	1	4	2	1	2	3	3	2	3	4	3	1	3

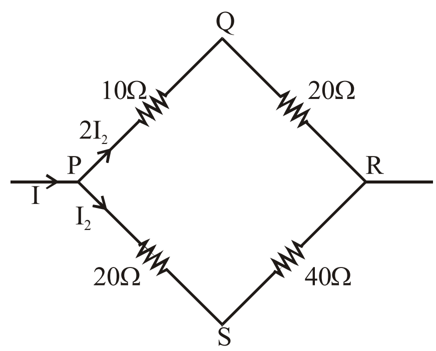
HINT – SHEET

1. Resistance across AC is more than CB.

2. it is balanced Wheatstone bridge

$\therefore$ no current through G

hence



$H_{PQ} : H_{QR} : H_{PS} : H_{SR}$

$\therefore (2I_2)^2 \times 10 : (2I_2)^2 \times 20 : I_2^2 \times 20 : I_2^2 \times 40$

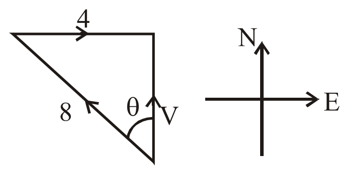
$H_{PQ} : H_{QR} : H_{PS} : H_{SR}$

$\therefore 2 : 4 : 1 : 2$

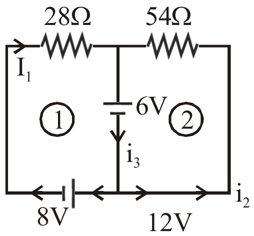
3. In order to arrive at the opposite bank, the boat should start at an angle θ with north such that

$\sin\theta = \frac{4}{8}$ or $\theta = 30°$. The real velocity of boat will be

$v = \sqrt{8^2 - 4^2} = \sqrt{48},\ \theta = 30°\,\text{W of N}$



4. Suppose current through different paths of the circuit is as follows.



After applying KVL for loop (1) and loop (2)

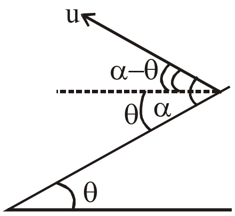
We get $28i_1 = -6 - 8 \Rightarrow i_1 = -\frac{1}{2}A$

and $54i_2 = -6 - 12 \Rightarrow i_2 = -\frac{1}{3}A$

Hence $i_3 = i_1 + i_2 = -\frac{5}{6}A$

5. Angle of projection with horizontal = $\alpha - \theta$

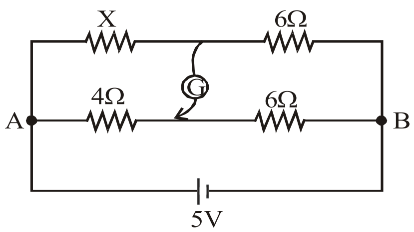
so minimum speed = $u \cos(\alpha - \theta)$



6. $mLJ = \frac{V^2}{R}$

$$\Rightarrow \quad m = \frac{V^2}{LJ\,R} = \frac{(210)^2}{80 \times 4.2 \times 20} = 6.56\,gs^{-1}$$

7.



Resistance of the part AC

$R_{AC} = 0.1 \times 40 = 4\Omega$

and $R_{CB} = 0.1 \times 60 = 6\Omega$

In balanced condition = $\frac{X}{6} = \frac{4}{6} \quad \Rightarrow \quad X = 4\Omega$

Equivalent resistance $R_{eq} = 5\Omega$

so current drawn from battery $i = \frac{5}{5} = 1A$

8. Let speed of elevator be v_e.

$$t_1 = \frac{L}{v_e} \Rightarrow 1\,min = \frac{L}{v_e}$$

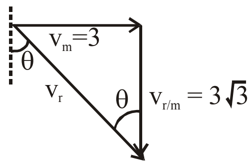
let speed of person relative to elevator be v_p, then

$$t_2 = \frac{L}{v_p} \Rightarrow 3\,min = \frac{L}{v_p}$$

when the escalator is moving

$$t_3 = \frac{L}{v_e + v_p} = \frac{L}{\frac{L}{1\,min} + \frac{L}{3\,min}} = \frac{3}{4}min = 45s$$

9. $\vec{v}_{r/m} = \vec{v}_r - \vec{v}_m$



$\vec{v}_r = \vec{v}_{r/m} + \vec{v}_m$

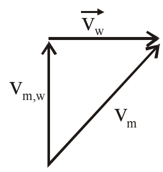
$$\tan\theta = \frac{3}{3\sqrt{3}} = \frac{1}{\sqrt{3}} \qquad \Rightarrow \theta = 30°$$

10. $\frac{110 \times R}{110 + R} = 11 \qquad \Rightarrow 10R = 110 + R$

$\Rightarrow 9R = 110$

$R = 12.22\ \Omega$

11.



Time to cross river

$$T = \frac{336}{1} = 336\,sec$$

12. Using $v = u + at$

$\Rightarrow 20 = u + a \times 10$ ...(i)

and $s_n = u + \frac{a}{2}(2n - 1)$

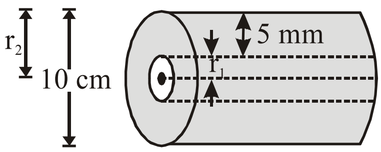
$\Rightarrow 10 = u + \frac{a}{2}(2 \times 10 - 1)$ ...(ii)

On solving (i) and (ii) we get $a = 20\ m/s^2$

13. By using $R = \rho.\frac{l}{A}$; here A = $\pi(r_2^2 - r_1^2)$

Outer radius r_2 = 5 cm

Inner radius r_1 = 5–0.5 = 4.5 cm



So R = $1.7\times10^{-8}\times \frac{5}{\pi\{(5\times10^{-2})^2-(4.5\times10^{-2})^2\}}$

= $5.6\times10^{-5}\Omega$

14. The relative acceleration of one particle w.r.t. to the other is zero, so relative velocity is constant in magnitude and direction.

15. The heat supplied under these condition is the change in internal energy Q = ΔU. The heat supplied is Q = i^2Rt

$1\times1\times100\times5\times60 = 30000$ J = 30 kJ

16. For potentiometer short circuit = xl_1

x depends only on primary circuit

(i) $E_1\uparrow \Rightarrow x\uparrow \Rightarrow l_1\downarrow$ if secondary circuit remains same

(ii) $R\uparrow \Rightarrow x\downarrow \Rightarrow l_1\uparrow$ if secondary circuit remains same

(iii) $S.C\uparrow = l_1\uparrow$ if x remains same

17. $T = \frac{2\times10\sqrt{3}\sin(60°-30°)}{10\cos30°}$s

= 4 sin 30° = 2s

18. $\vec{v}_A = 60\hat{i}, \vec{v}_B = 40\hat{i}$

$\vec{v}_{B/A} = \vec{v}_B = 40\hat{i} - 60\hat{i} = -20\hat{i}$

So direction is opposite to that of trains.

19. $v^2 = a + bx$

v increases as x increases

$$a = v\frac{dv}{dx} = \frac{1}{2}\frac{d}{dx}(v^2) = \frac{b}{2}$$

20. In case of stretching of wire $R \propto \ell^2$

$\Rightarrow$ If length becomes 3 times so Resistance becomes 9 times i.e., R' = 9 × 20 = 180 Ω.

21. Let the resistance of the lamp filament be R. Then $100 = (220)^2/R$. When the voltage drops, expected power is $P = (220\times0.9)^2/R'$. Here, R' will be less than R, because now the rise in temperature will be less. Therefore, P is more than $(220\times0.9)^2/R$ = 81 W. But it will not be 90% of the earlier value, because fall in temperature is small. Hence, option (4) is correct.

22. $E = \frac{iR}{L} = \frac{i.\rho}{A} = \frac{neAv_d\rho}{A} \Rightarrow v_d \propto E$ (Straight line)

$$P = i^2R = \left(\frac{EA}{\rho}\right)^2 R \Rightarrow P \propto E^2$$

(Symmetric parabola)

Also $P \propto i^2$ (parabola)

Hence, all graphs a, b, d are correct and c is incorrect.

23. Potential gradient

$$x = \left(\frac{12}{8+16}\right)\times 4 = 2Vm^{-1}$$

Effective emf of E_1 and E_2

$$E = \frac{\frac{E_2}{r_2} - \frac{E_1}{r_1}}{1/r_1 + 1/r_2} = \frac{1}{2}\text{ volt}$$

Balancing length $= \left(\frac{1}{2}\right)\left(\frac{1}{2}\right) = \frac{1}{4}m = 25cm$

24. The ball has zero initial speed and smaller average speed during the time of flight to the passing point. So the ball must travel a smaller distance to the passing point than the ball your friend throws.

25. emf should be 125V

for second case : $\frac{100}{2500} = \frac{25}{R} \Rightarrow R = 625\Omega$

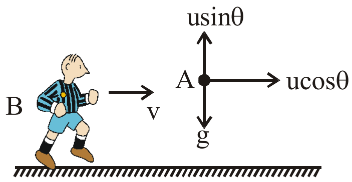
26. It is given $R_{Hot} = 10R_{Cold}$ also resistance at rated temperature

$$R = \frac{V^2}{P} = \frac{200\times200}{100} = 400\Omega$$

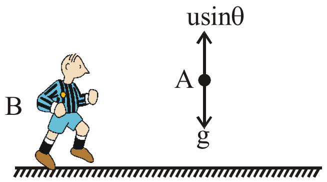
So resistance when lamp not in use

$$R_{Cold} = \frac{R_{Hot}}{10} = \frac{400}{10} = 40\Omega$$

27. The horizontal and vertical components of initial velocity of projectile are as shown in figure. Since the observer moving with uniform velocity v sees the projectile moving in straight line Hence $v = u\cos\theta$



velocity of A given from frame of B



velocity of A given from frame of B

The time of flight as measured by observer B

$$T = \frac{2u\sin\theta}{g}$$

Hence horizontal range of projectile on ground

$R = (u\cos\theta)T = vT$

28. $\frac{i}{i_g} = 1 + \frac{G}{S} \Rightarrow \frac{5}{0.05} = 1 + \frac{50}{S}$

$$\Rightarrow S = \frac{50}{99} = \frac{\rho \times l}{A}$$

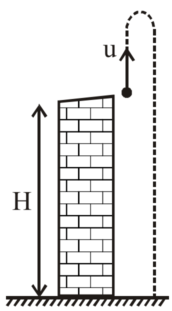
$$\Rightarrow l = \frac{50}{99} \times \frac{2.97 \times 10^{-2} \times 10^{-4}}{5 \times 10^{-7}} = 3\text{m}$$

29. When a particle is thrown vertically upwards with a speed u, at highest point the velocity of the particle will be zero,

Using $v = u + at$

$$0 = u - gt \qquad \Rightarrow t = \frac{u}{g} \qquad ...(i)$$

The time taken by the particle, to hit the ground, is n times that taken by it to reach the highest point of its path



Let $t_1 = nt$

Using, $s = ut_1 + \frac{1}{2}at_1^2$

$$\Rightarrow -H = u(nt) - \frac{1}{2}g(nt)^2$$

$$\Rightarrow -H = u \times n\left(\frac{u}{g}\right) - \frac{1}{2}gn^2\left(\frac{u}{g}\right)^2 \qquad \text{[using (i)]}$$

$$\Rightarrow 2gH = 2nu^2 - n^2u^2 \Rightarrow nu^2\ (n-2)$$

30. The train is moving with horizontal velocity in a straight line; hence vertical ranges will be same. For a person inside the train, the horizontal range will be zero, because train is an inertial frame. The coin falls back to his hand. For a person outside the train such as C, the coin has a horizontal velocity and vertical acceleration g. Hence it appears to follow a parabolic path. Hence the observes a horizontal range.

31. $I_{max} = \frac{150}{10} = 15\text{mA}$, $V_{max} = \frac{150}{2} = 75\text{mV}$

resistance of galvanometer ;

$$G = \frac{V_{max}}{I_{max}} = \frac{75}{15} = 5\Omega$$

Now range of voltmeter = 150 × 1 = 150 V

$150 = (5 + R)I_{max} \Rightarrow R = 9995\ \Omega$

32. As slope of s-t graph decreases with t, so v-t will decrease. At the top of the graph slope is zero, so velocity is zero. In the downward journey slope of s-t graph increases negatively. So velocity represented by it will be negative.

33. It cells are connected in series :

$E_{eq} = 2E$, $r_{eq} = 2r$.

Maximum power will be transferred if

$R = r_{eq} = 2r$

Then current in R : $I = \frac{E_{eq}}{R + r_{eq}} = \frac{2E}{2r + 2r} = \frac{E}{2r}$

Power $= I^2R = \left(\frac{E}{2r}\right)^2 2r = \frac{E^2}{2r}$

It cells are connected in parallel ; $E_{eq} = E$,

$r_{eq} = \frac{r}{2}$

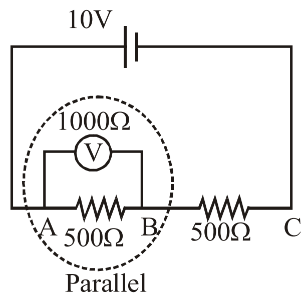
For maximum power : $R = r_{eq} = \frac{r}{2}$. Then current in R : $I = \frac{E_{eq}}{R + r_{eq}} = \frac{E}{\frac{r}{2}+\frac{r}{2}} = \frac{E}{r}$

Power $I^2R = \left(\frac{E}{r}\right)^2 \frac{r}{2} = \frac{E^2}{2r}$

Hence [i-q] [ii-q] [iii-s] [iv-r]

34. Resistance between A and B

$= \frac{1000 \times 500}{(1500)} = \frac{1000}{3}$



So, equivalent resistance of the circuit

$R_{eq} = 500 + \frac{1000}{3} = \frac{2500}{3}$

∴ Current drawn from the cell

$i = \frac{10}{(2500/3)} = \frac{3}{250}A$

Reading of voltmeter of potential difference across $AB = \frac{3}{250} \times \frac{1000}{3} = 4V$

35. Here, $\theta = 30°$, $u = 10\ ms^{-1}$

$R = 17.3$ m, $g = 10\ m^{-2}$

For horizontal motion, $R = u \cos\theta t$

$t = \frac{R}{u\cos\theta} = \frac{17.3}{10\cos 30°}$

$= \frac{17.3 \times 2}{10 \times \sqrt{3}} = \frac{17.3 \times 2}{10 \times 1.73} = 2s$

For vertical motion, $h = u \sin\theta t - \frac{1}{2}gt^2$

$= 10 \sin 30° \times 2 - \frac{1}{2} \times 10 \times 2^2$

$= 10 - 20 = -10m$

Height of tower = 10 m

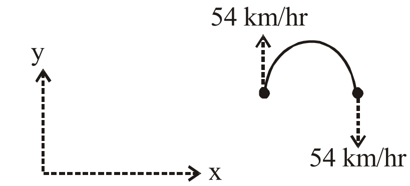
36. $E = \frac{e}{(R + R_h + r)} \frac{R}{L} \times l$

$= \frac{2}{(10+40+0)} \times \frac{10}{1} \times 0.4 = 0.16V$

37. Average acceleration $(\vec{a})$

$= \frac{\vec{V}_f - \vec{V}_i}{\text{total time taken}} = \frac{-54\hat{j} - (54\hat{j})}{10\,\text{sec}}$

$\frac{-108\hat{j}}{10\,\text{sec}} \text{km/hr} = -3\text{m/sec}^2$



So magnitude of average acceleration $(\vec{a}) = 3\,\text{m/sec}^2$

38. 1A = 1000 mA

$900 \times 10^{-3}S = 100 \times 10^{-3} \times 1000$

$\Rightarrow S = \frac{1000}{9} = 111\Omega$

39. $R = \frac{V^2}{P} \quad \Rightarrow R_1 = \frac{200 \times 200}{100} = 400\Omega$

and $R_2 = \frac{100 \times 100}{200} = 50\Omega$

Maximum current rating $i = \frac{P}{V}$

So $i_1 = \frac{100}{200}$ and $i_2 = \frac{200}{100} \quad \Rightarrow \frac{i_1}{i_2} = \frac{1}{4}$

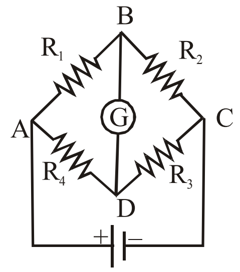
40. Acceleration means change in velocity. So if there is acceleration, velocity will change definitely.

Under acceleraton, speed may not change if direction changes and direction may not change if speed changes.

41. In balance condition, no current will flow through the branch containing S.

42. Once the ball has left the thrower's hand, it is a freely falling body with a constant, non-zero, acceleration of a = –g. Since the acceleration of the ball is not zero at any point on its trajectory, choices (a) through (c) are all fase and the correct response is (d)

43.



Equivalent circuit

44. Time taken by package to reach the ground

$$T = \sqrt{\frac{2 \times 180}{10}} = 6s$$

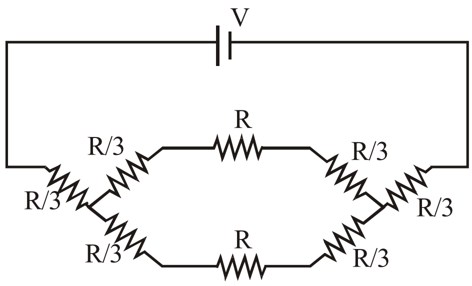
Horizontal distance travelled by helicopter in this time = 8 × 6 = 48 m

Velocity of package w.r.t. ground
= 12 – 8 = 4 m/s in backward direction.

Horizontal distance travelled by package in time
T = 4 × 6 = 24 m.

So horizontal distance between them
= 48 × 24 = 72 m

45.



We convert the deltas ABE and CDF to stars.

equivalent resistance = $\frac{R}{3} + \frac{5R}{6} + \frac{R}{3} = 1.5R$

$$I = \frac{V}{1.5R} = \frac{3}{1.5 \times 2} = 1A$$

OR

Point B and E are at same potential so we can remove 3
similarly we can remove 5

then $6\Omega \| 6\Omega = 3\Omega$ and $I = \frac{3}{3} = 1A$

46. Sudden jump between 4^{th} & 5^{th} IP means 'X' have four electron
So configuration will be ns^2, sp^2 – 14^{th} groups/IV A

47. $I.P \propto z_{eff} \propto \frac{+\text{ive charge}}{-\text{ive charge}}$

48. $\mu = \sqrt{n(n+2)}$ B.M. n = no. of unpaired el^-
$\mu \propto$ no. of unpaired electron.

49. s-block = ns^2 p-block = ns^2sp^6
d = $(n-1)\ d^{-10}\ ns^2$
f-block = $(n-2)f^{1-14}\ (n-1)d^{0.1}ns^2$

50. IP is not possible

51. Size of isoelectronic species is
Anion > Neutral > Cation

52. (i) due to penepating power ns^2 configuration > ns^2np^1 configuration.
(ii) Due to half filled stable configuration I.P. of N > IP of O
(iii)$ns^2 < ns^2np^3 < ns^2np^6$

53. (i) & (ii) Z_{eff} & σ increases along the period.
(iii)$Z_{eff} = Z - \sigma$ means not equal to no. of proton

55. Radius of Al ≃ Radius of Ga due to transitional compaction.

56. $F > Cl > Cl^- > F^-$ I.P. order

57. $N + e^- \rightarrow N^-$ - endothermic so $N^- \rightarrow N + e^-$ is exothermic

60. x must be metals so its EN will be low.

62. EA of Cl > EA of F

63. Acidic nature ∝ EN

64. Due to more IP than 'O'. Nitrogen can't attain time

65. EA – Cl > F > Br

66. If Aufbau principle is not followed then energy order will be 20^{th} el^- will enter is 3d.

67. F has maximum electronagativity.

68. All are same and can be interconverted by simple mathematics.

69. Mili mol of $AgNO_3$ = 0.1 × V
Mili mol of NaCl = 0.2 × V
∴ Mili mol of NO_3^- = 0.1 × V and total V = 2V

$$\therefore \left[NO_3^-\right] = \frac{0.1 \times V}{2V} = 0.05$$

70. Mili equivalent of HCl = 100 × 0.3 = 30
Mili equivalent of H_2SO_4 = 200 × 0.6 = 120

$$\therefore N_{mixture} = \frac{30+120}{300} = \frac{1}{2}$$

71. $m = \frac{0.5 \times 1000}{500} = 1$

72. $\frac{P^0 - P}{P^0} = \frac{n}{N+n} = \frac{w/m}{W/M}$ $[\because n \ll N]$

$$\frac{\Delta P}{P^\circ} = \frac{5/60}{95/18} = 0.016$$

73. Liquid A has lower boiling point hence will have higher vapour pressure.

74. $P_T = X_A\ P_A^0 + X_{H_2O}P_{H_2O}^0$

$n_A = \frac{28}{140} = 0.2$

$W_{H_2O} = 100 - 28 = 72,\quad n_{H_2O} = \frac{72}{18} = 4$

$n_T = 0.2 + 4 = 4.2$

$P_T = 160\ \ P_{H_2O}^0 = 150$

$160 = \frac{0.2}{4.2}\times(P_A^0) + \frac{4}{4.2}\ (150)$

$\Rightarrow \boxed{P_A^0 = 360\text{ mm}}$

75. For BOH

pH = 12, pOH = 2 and $[\bar{OH}] = 10^{-2}$

$\therefore\ \alpha = \frac{10^{-2}}{0.02} = 0.5$

and i = 1 – 0.5 + 2 × 0.5 = 1.5

now, π = iCRT

= 1.5 × 0.02 × 0.0821 × 300

= 0.7389 ≃ 0.74 atm

76. i(↑), freezing point (↓)

77. For association $\propto = \frac{1-i}{1-\frac{1}{n}}$ $\quad n = 4$

78. Boiling point α number of particles.

79. Shows positive deviation

80. $d_{sol} = \frac{\text{mass}}{\text{volume}}$

$V_{sol} = \frac{100}{0.6}\text{mL}$

$N = \frac{w}{E_w}\times\frac{1}{V(L)} = \frac{35}{35}\times\frac{1000}{100}\times 0.6 = 6$

81. $i = \frac{\text{observed no. of particles}}{\text{theoretical no. of particles}}$

and $i = \frac{1-\alpha+\alpha/n}{1}$

82. $\Delta T_f = \frac{1000K_f \times W_{solute}}{mW_{solvent}}$

$W_{solvent} = \frac{1000\times 1.86\times 50}{62\times 9.3}$

= 161.29 g

and amount of ice = 200 – 161.29

= 38.71 g

83. According to Henry's law

S = K_H × p (S = conc. of O_2 dissolved)

$S = 1.4\times 10^{-3}\times 0.5 = 7\times 10^{-4}\text{ mol/L} = \frac{w/M_w}{V_L}$

$\Rightarrow w = 7\times 10^{-4}\times M_w \times V_L$

$= 7\times 10^{-4}\times 32\times 0.1$

$= 22.4\times 10^{-4}\text{ g} = 2.24\text{ mg}$

84. $\pi = iCRT = i\times\frac{n}{V}\times RT$

$n = \frac{\pi\times V}{i\times R\times T} = \frac{0.5\times 2}{2.47\times 0.0821\times 300}$

= 0.0164 mol

∴ w = 0.0164 × 111 g

= 1.820 g

85. π = CRT

$\Rightarrow C = \frac{\pi}{RT} = \frac{4.82}{0.0821\times 293} = 0.2M$

86. $\Delta T_f = \frac{1000K_f w}{mW}$

$\therefore\ m = \frac{1000\times 1.86\times 7}{0.93\times 93} = 150.53$

87. ΔT_f will be minimum for the solution with minimum number of particles.

88. mole of $C_2H_6O = \frac{828}{46} = 18$

mole of $H_2O = \frac{36}{18} = 2$

$\therefore\ X_{H_2O} = \frac{n}{n+N} = \frac{2}{2+18} = 0.1$

89. $\because N = \dfrac{w \times 1000}{E \times V(\text{in mL})}$

$\therefore\ 0.1 = \dfrac{w \times 1000}{100 \times 100} (\because E_{acid} = \dfrac{200}{2})$

$\therefore\ w = 1g$

90.

	XY_2	$\rightleftharpoons$	X^{2+}	+	$2Y^-$
Initially	1		0		0
at equilibrium	$1-\alpha$		α		2α

Total number of moles = $1 - \alpha + \alpha + 2\alpha$

$= 1 + 2\alpha$

$i = \dfrac{\text{Normal molar mass}}{\text{Observed molar mass}}; \dfrac{1+2\alpha}{1} = \dfrac{164}{65.6}$

$\therefore\ \alpha = 0.75$; % α = 75%

91. Fig. 2.5(b), 2.4, 2.6(b), 2.3

92. Statement A is correct

96. Fig. 3.2, 3.3, 3.4

97. NCERT (XI) Pg. # 43, 2nd para

Lycopodium is member of pteridophyta

98. NCERT (XIth) Pg. # 26, 2nd para

104. NCERT Pg. # 25, para 2.6

108. NCERT Pg. # 34, Fig. 3.2(c)

113. NCERT Pg. # 20, para 2.2.1

114. Statement A & D are correct.

116. NCERT Pg. # 6, 1st para

118. NCERT Pg. # 13, para 1.4.5

119. NCERT Pg. # 26, 2nd para

121. NCERT Pg. # 21, fig. 2.4

124. NCERT Pg. # 24, para 2.3, (2nd para)

126. NCERT Pg. # 22, para 2.3, (Ist para)

129. NCERT Pg. # 38, 1st para

134. NCERT Pg. # 13, para 1.4.5

135. NCERT Pg. # 34, fig. 3.2(A)

137. NCERT Pg. # 30, last para

139. NCERT Pg. # 18, last para

140. NCERT Pg. # 23, 3rd para

143. NCERT Pg. # 29, 30, 1st para

144. NCERT Pg. # 32, 1st para

146. NCERT Pg. # 21, para 2.2.4

149. NCERT Pg. # 39, 1st para

150. NCERT Pg. # 31, fig. 3.1

151. NCERT Pg. # 35, 2nd para

153. NCERT Pg. # 36, para 3.3

156. NCERT Pg. # 19, 1st para

157. NCERT Pg. # 21, para 2.2.2

160. NCERT Pg. # 7, Ist para

165. NCERT Pg. # 18, last para

169. NCERT Pg. # 30, 2nd para

170. NCERT Pg. # 19, para 2.1.1 last line

172. NCERT Pg. # 20, para 2.2.1

174. NCERT Pg. # 21, para 2.2.2

175. NCERT Pg. # 32, para 3.1.1

176. NCERT Pg. # 33, Table 3.1

178. NCERT Pg. # 19, para 2.1.2

179. NCERT Pg. # 23, para 2.3.2