NURTURE TEST SERIES

Test Type : **MOCK TEST** Test Pattern : **NEET (UG)**

ANSWER KEY

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

HINT – SHEET

1. Ans (3)

$[Z] = [xP] = [G]$

$[Z] = [x]\,[ML^{-1}T^{-2}] = [M^{-1}L^{3}T^{-2}]$

$[Z] = [M^{-1}L^{3}T^{-2}]$

$[x] = [M^{-2}L^{4}T^{0}]$

2. Ans (2)

$U = \frac{a}{x^2} - \frac{b}{x}$

$\left[\frac{a}{x^2}\right] = \left[\frac{b}{x}\right]$

$\left[\frac{a}{b}\right] = [x] = [L]$

3. Ans (2)

Main scale reading = 3.4 cm

L.C. = 0.01 cm

Vernier coincidence = 6

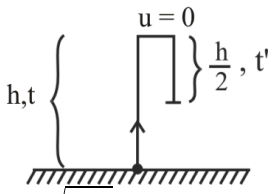
Reading = 3.4 + 6 × 0.01 = 3.46 cm

Corrected reading = Reading – zero error

= 3.46 – (–0.03) = 3.49 cm

4. Ans (3)

$t = \sqrt{\frac{2h}{g}}$



$t' = \sqrt{\frac{2}{g}\frac{h}{2}}$

$t' = \sqrt{\frac{h}{g}} = \frac{t}{\sqrt{2}}$

Total time $= t + t' = t + \frac{t}{\sqrt{2}}$

$= t\left(1 + \frac{1}{\sqrt{2}}\right)$

5. Ans (1)

$\vec{V}_A = V_A\hat{i}$

$\vec{V}_B = V_B\cos\theta\hat{i} + V_B\sin\theta\hat{j}$

$\vec{V}_{rel} = (V_B\cos\theta - V_A)\hat{i} + V_B\sin\theta\hat{j}$

$V_B\cos\theta - V_A = 0$

$\frac{V_A}{V_B} = \cos\theta$

6. Ans (3)

$a = \frac{F_x}{m} = \frac{20\cos 60^\circ}{2} = 5ms^{-2}$

$S = \frac{1}{2}at^2 = \frac{1}{2}(5)(1)^2 = \frac{5}{2}$ m

$W = Fs\cos\theta = 20\left(\frac{5}{2}\right)\frac{1}{2} = 25$ J

7. Ans (1)

Difference in kinetic energy = Charge in potential energy

= mgh

= mg(2r)

= 2 mgr = 2×1×10×1 = 20J.

8. Ans (2)

$F = -\frac{du}{dr} = -\frac{d}{dr}\left[\alpha r^{-4} - \beta r^{-5}\right]$

$= -\left[\alpha(-4r^{-5}) - \beta(-5r^{-6})\right]$

For equilibrium, F = 0

$\frac{4\alpha}{r^5} = \frac{5\beta}{r^6}$

$\boxed{r = \frac{5\beta}{4\alpha}}$

9. Ans (1)

$T_3 = (3m)(3r)\omega^2 = 9mr\omega^2$

$T_2 - T_3 = (2m)(2r)\omega^2$

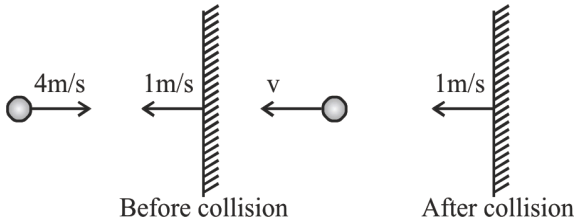
$T_2 = 13\ mr\omega^2$

$T_1 - T_2 = mr\omega^2$

$T_1 = 14\ mr\omega^2$

$T_1 \Rightarrow$ maximum

10. Ans (4)



Let v be the velocity of ball after collision.

Collision is elastic.

$\therefore$ e = 1

or relative velocity of separation=relative velocity of approach

$\therefore$ v − 1 = 4 + 1

or v = 6 m/s (away from the wall)

11. Ans (3)

mg ℓ_2 = 16 g ℓ_1 .....(i)

mg ℓ_1 = 4g ℓ_2 .....(ii)

$\Rightarrow \frac{16}{m} = \frac{m}{4} \Rightarrow m = 8$ kg

12. Ans (2)

Angular momentum will be conserved if net torque acting on the system becomes zero.

Given force acting $\vec{F} = \alpha\hat{i} + 3\hat{j} + 6\hat{k}$ (i)

and $\vec{r} = 2\hat{i} - 6\hat{j} - 12\hat{k} = -2(-\hat{i} + 3\hat{j} + 6\hat{k})$ (ii)

If torque becomes zero then $\vec{r} \times \vec{F} = 0$

If $\alpha = -1$ then, $\vec{r} \times \vec{F} = 0$

14. Ans (2)

$\Delta\ell = \frac{F\ell}{AY} = \frac{(mg)\ell}{\frac{\pi d^2}{4} \cdot Y}$

$= \frac{4 \times 8000 \times 10 \times 3.14}{\pi(0.25)^2 \times 2 \times 10^{11}} = 0.026 \times 10^{-3}$ m

= 0.026 mm

15. Ans (3)

$Y = 2\eta(1 + \sigma)$

$3.84 \times 10^9 = 2 \times 1.6 \times 10^9 (1 + \sigma)$

$1 + \sigma = \frac{3.84}{3.20}$

$\sigma = 1.2 - 1 = 0.2$

16. Ans (2)

Using Pascal's law

$P_{atm} + \rho_{oil}\, g(10) = P_{atm} + \rho_w g(8)$

$\rho_{oil} = \frac{4}{5}\rho_w = 0.8$ g/cm^3

17. Ans (3)

$V_T = \frac{2r^2}{9\eta}(\rho - \sigma)g$

Here r and η unchanged

$\frac{(V_T)_{Gold}}{(V_T)_{Silver}} = \frac{(19.5 - 1.5)}{(10.5 - 1.5)} = 2$

$(V_T)_{Silver} = \frac{(V_T)_{Gold}}{2} = \frac{0.2}{2} = 0.1$ m/s

18. Ans (3)

By theory of equation of continuity.

AV = constant

A ↓ V ↑

19. Ans (3)

$\eta = 1 - \frac{T_2}{T_1}$; $1 - \frac{300}{T_1} = 0.4$

$T = 500$ K

Now, $1 - \frac{300}{T_1'} = \frac{1}{2}$

$T'_1 = 600$ K

$\Delta T = 100$ K

20. Ans (2)

$T_1 V_1^{\frac{5}{3}-1} = T_2 V_2^{\frac{5}{3}-1}$

$(300)V_1^{2/3} = T_2\left(\frac{8}{27}V_1\right)^{2/3}$

$\Rightarrow T_2 = 675$ K

Increase in temp. = 675 – 300

= 375 K or 375°C

21. Ans (4)

$\frac{dU}{dQ} = \frac{nC_V\,dT}{nC_P\,dT} = \frac{C_V}{C_P} = \frac{1}{\gamma}$

for diatomic gas $\gamma = \frac{7}{5}$

so $\frac{dU}{dQ} = \frac{5}{7}$

22. Ans (1)

$(V_{RMS})_{O_2} = (V_{RMS})_{N_2}$

$\sqrt{\frac{3RT_{O_2}}{M_{O_2}}} = \sqrt{\frac{3RT_{N_2}}{M_{N_2}}}$

$\frac{T_{O_2}}{32} = \frac{280}{28} = 10$

$T_{O_2} = 320$K

23. Ans (2)

At constant pressure

$\frac{\Delta T}{T} \times 100 = \frac{\Delta V}{V} \times 100$

$2.5 = \frac{10}{V} \times 100$

$V = 400\ m^3$

24. Ans (3)

$K_{eq} = \frac{K_1 + K_2}{2} = \frac{K + 2K}{2} = \frac{3K}{2}$

25. Ans (4)

Let, $T = 2\pi\sqrt{\frac{\ell}{g}}$

Let, V be the volume of the mass

$V \times \rho \times g$ is acting downwards

$V \times \frac{\rho}{8} \times g$ is acting upwards

Inside the liquid, the effective force downwards

$= V\rho g \times \frac{7}{8}$, i.e., effective g is $\frac{7}{8}$ g

$\therefore \quad T' = 2\pi\sqrt{\frac{\ell}{(7/8)\,g}}$

or $T' = 2\pi\sqrt{\frac{8\ell}{7g}} = \sqrt{\frac{8}{7}}T$

26. Ans (2)

$x = A\sin(\omega t + \phi)$

$A = 0.1$m, $\phi = \frac{\pi}{4}$

K. E. $= \frac{1}{2}m\omega^2A^2$

$8 \times 10^{-3} = \frac{1}{2} \times 0.1 \times \omega^2 \times \frac{1}{100}$

$\omega^2 = 16$

$\omega = 4$ rad/s

$x = 0.1\sin\left(4t + \frac{\pi}{4}\right)$

27. Ans (4)

$x = A\sin\left(\frac{2\pi}{16} \times 2\right) = \frac{A}{\sqrt{2}}$

$4 = \omega\sqrt{A^2 - x^2}$

$\Rightarrow A = \frac{32\sqrt{2}}{\pi}$

28. Ans (2)

$e = \frac{\ell_2 - 3\ell_1}{2}$

29. Ans (2)

for oop $\ell_n = \frac{n\lambda}{2} = 16$cm ...(i)

and $\ell_{(n+1)} = (n+1)\frac{\lambda}{2} = 46$cm ...(ii)

using (i) & (ii)

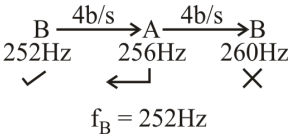
$\frac{\lambda}{2} = 30$cm

$\Rightarrow \lambda = 60$ cm

$\therefore v = n\lambda = 500 \times 60 \times 10^{-2}$

= 300 m/s

30. Ans (2)



$f_B = 252Hz$

31. Ans (2)

$$v = \sqrt{\frac{\text{Stress}}{\text{density}}}$$

32. Ans (3)

We know that $\frac{dA}{dt} = \frac{L}{2m}$ (L⟶angular momentum)

$L = mr^2\omega$

$$\frac{dA}{dt} = \frac{mr^2\omega}{2m}$$
$$\frac{dA}{dt} = \frac{r^2\omega}{2}$$
$$\frac{dA}{dt} \propto \omega r^2$$

33. Ans (2)

$v = 0$ and $a \neq 0$ [turning point]

$\vec{v}$ = constant then v = constant

But v = const. then $\vec{v}$ may be const. [direction change]

34. Ans (3)

Let $\vec{P}$ is a vector $\perp$ to both $\vec{A}$ and $\vec{B}$

$\vec{P} = \vec{A} \times \vec{B}$

$= \left(2\hat{i} + \hat{j} + \hat{k}\right) \times \left(\hat{i} + \hat{j} + \hat{k}\right)$

$\vec{P} = \hat{k} - \hat{j}$

Unit vector along $\vec{P} = \frac{\vec{P}}{|\vec{P}|} = \frac{\hat{k} - \hat{j}}{\sqrt{2}}$.

35. Ans (2)

Let time of journey is t

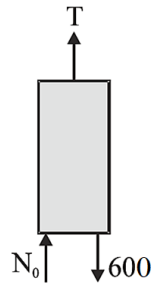
average velocity = $\frac{8}{t}$ m/sec

average speed = $\frac{10}{t}$ m/sec

ratio of average velocity to average speed is = $\frac{8/t}{10/t} = \frac{4}{5}$

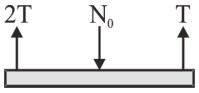
36. Ans (1)

Man :



$T + N_0 - 600 = 0$

Plank :



$3T - N_0 = 0$

37. Ans (4)

$N = mg\cos\theta$

$f = mg\sin\theta$

$f_{net} = \sqrt{N^2 + f^2} = mg = 30\ N$

38. Ans (1)

$$\frac{mg}{n} = \mu N = \mu\left(mg - \frac{mg}{n}\right)$$
$$\frac{1}{n} = \frac{1}{4}\left(1 - \frac{1}{n}\right) \Rightarrow 4 = n - 1$$
$$\Rightarrow n = 5$$

maximum length of the chain that can hand over one edge of the table is $\frac{L}{5}$

39. Ans (2)

Mass of man = m

Mass of block = M

$m(L - X) + M(-X) = O$

$$\frac{L - X}{X} = \frac{M}{m}$$

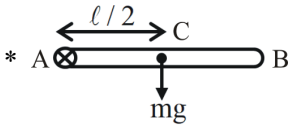
40. Ans (1)

MI of given ring = $\frac{MR^2}{2}$

Where $\pi R = L \Rightarrow R = \frac{L}{\pi}$

So, $I = \frac{ML^2}{2\pi^2}$

41. Ans (2)



$\tau_H = I_H \alpha \Rightarrow mg \times \frac{\ell}{2} = \frac{m\ell^2}{3} \times \alpha$

$\Rightarrow \alpha = \frac{3g}{2\ell}$ (same for all points)

* Acceleration of C : $a_C = \alpha r = \frac{3g}{2\ell} \times \frac{\ell}{2} = \frac{3g}{4}$

Acceleration of B : $a_B = \alpha r = \frac{3g}{2\ell} \times \ell = \frac{3g}{2}$

42. Ans (4)

$\gamma_{mono} = 1 + \frac{2}{3} = \frac{5}{3} = 1.66$

$\gamma_{di} = 1 + \frac{2}{5} = \frac{7}{5} = 1.4$

$f_{mono} = 3, f_{dia} = 5$

43. Ans (2)

$\gamma_L = \gamma_{app.} + \gamma_{vessel}$

$\gamma_L \Rightarrow$ same

$(\gamma_L)_S = (\gamma_L)_C$

$S + 3x = C + 3A$

$x = \frac{C + 3A - S}{3}$

44. Ans (2)

$n \propto \frac{1}{\ell} \Rightarrow \frac{n_1}{n_2} = \frac{\ell_2}{\ell_1}$

$\Rightarrow \frac{n+4}{n-4} = \frac{100}{95}$

45. Ans (2)

$T = \frac{2\pi R}{v}$

$\frac{GMm}{R^n} = \frac{mv^2}{R}$

or $v = \left[\frac{GM}{R^{n-1}}\right]^{1/2}$

$\therefore T = \frac{2\pi R}{\sqrt{GM/R^{n-1}}} = \frac{2\pi}{\sqrt{GM}} \times R^{(n+1)/2}$

$\therefore \quad T \propto R^{(n+1)/2}$

46. Ans (2)

(a) $20 \longrightarrow {}_{18}[Ar]\ 4s^2$ - s-block

(b) $29 \longrightarrow {}_{18}[Ar]\ 3d^{10}\ 4s^1 \longrightarrow$ d-block

(c) 33 - ${}_{18}[Ar]\ 3d^{10}\ 4s^2\ 4p^3$ - p-block

(d) 66 - ${}_{54}[Xe]\ 4f^{10}\ 6s^2$ - f-block

47. Ans (1)

across the period radius $\downarrow$

48. Ans (1)

After losing 1 el^- attain ns^2 stable configuration

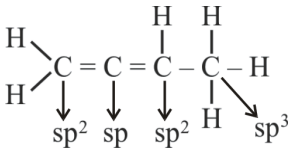
49. Ans (3)

O_2^+ contain 1 unpaired ℓ^-

50. Ans (3)

$SO_2 - sp^2$ hybridisation having 1 L.P. on 'S'.

51. Ans (4)



54. Ans (4)

Heat is path function.

56. Ans (4)

'O' have min value of $\Delta_{eg}H$ in its group

57. Ans (1)

Isobars $\Rightarrow$ Mass no. same

Isotopes $\Rightarrow$ Atomic no. same

Isotones $\Rightarrow$ no. of neutrons same

Isodiaphers $\Rightarrow$ (n –p) same

58. Ans (4)

$W = -2.303\ nRT \log V_2/V_1$

59. Ans (1)

Let O. N. of S is x

$Na_2S_2O_3$

$+2 + 2x + 3(-2) = 0$

$2x = 4$

$x = +2$

60. Ans (2)

$2A \quad + 3B \longrightarrow 2C$

4mol 12 mol

A is LR

2 mole of A gives 2 mol of C

4 mol of A gives 4 mol of C

61. Ans (3)

For WAWB salt :

$$K_h = \frac{K_w}{K_a \times K_b}$$

62. Ans (1)

Combustion and neutralisation reactions are exothermic in nature.

$N_2 + O_2 \longrightarrow 2NO$(endothermic)

63. Ans (1)

$$K_P = \frac{P_{PCl_3} \times P_{Cl_2}}{P_{PCl_5}} = \frac{4 \times 4}{2} = 8 \text{ atm}$$

$$K_C = \frac{K_P}{(RT)^{\Delta n_g}} = \frac{8}{(0.0821 \times 300)^1} = \frac{8}{24} = \frac{1}{3}$$

64. Ans (1)

Stability of alkene $\propto$ No. of $\alpha-C-H$ bond.

$\therefore$ Ans. is (1)

65. Ans (1)

$$N_2 + 3H_2 \longrightarrow 2NH_3$$

20 kg 3 kg

$\left(\frac{20 \times 10^3}{28} \text{mol}\right)$ $\left(\frac{3 \times 10^3}{2} \text{mol}\right)$ (L.R.)

$\because$ 3 mol of H_2 produces NH_3 = 2 mol

$\therefore$ 1.5×10^3 mol H_2 will produce

$NH_3 = \frac{2}{3} \times 1.5 \times 10^3$

$= 10^3$ mol

$= 17 \times 10^3$ g

66. Ans (3)

$n = 1, 2 ..... \infty$

$\ell = 0$ to $n - 1$

$m = -\ell$ to $+\ell$ (including zero)

$s = +\frac{1}{2}$ or $-\frac{1}{2}$

67. Ans (2)

$Zn(OH)_2 \rightleftharpoons Zn^{+2} + 2OH^-$

$K_{sp} = [Zn^{+2}] [OH^-]^2$

$10^{-12} = 10^{-2} \times [OH^-]^2$

$10^{-10} = [OH^-]^2$

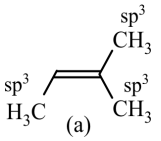
$10^{-5} = [OH^-]$

pOH = 5

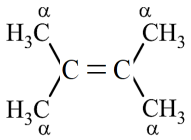
pH = 14–5 = 9

68. Ans (3)

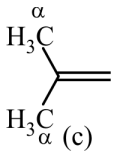
Alpha hydrogen is a hydrogen attached to the sp^3 carbon that is adjacent to carbocation free radical and C = C.



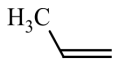
(a)



$\alpha-C-H=9$ $\alpha-C-H=12$



(c)



(d)

$\alpha-C-H=6$ $\alpha-C-H=3$

$\therefore$ $\alpha - H$ = (b) > (a) > (c) > (d)

69. Ans (2)

(1) 

Planar

(6πe– aromatic)

(2) 

Tub shape

Planar

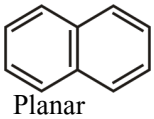
(non-planner)

(non aromatic)

(3) 

Planar

(6πe– aromatic)

(4) 

Planar

(10πe– aromatic)

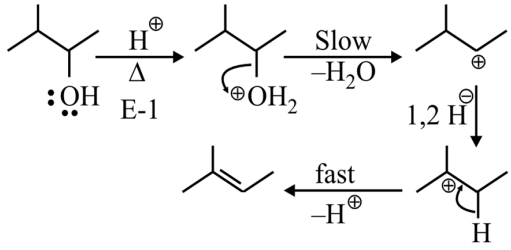
$\therefore$ Ans. (2)

70. Ans (3)

Fact

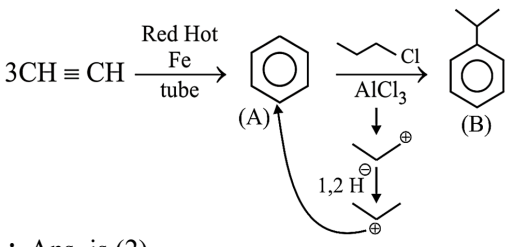
Ans. (3)

71. Ans (2)



$\therefore$ Ans. is (2)

72. Ans (2)



$\therefore$ Ans. is (2)

73. **Ans (4)**

Fact.

Ans. is (4)

74. **Ans (1)**

(1) $Ph-\overset{\oplus}{C}H-Ph$ (2-Ph resonance)

(2)  Anti aromatic (less stable)

(3) $Ph-\overset{\oplus}{C}H-CH_3$ (1 ph-Resonance and 1 CH_3 higher conjugation)

(4)  ($2\pi e^-$ Resonance + $2\alpha-C-H$)

∴ Over all (1) is more stable

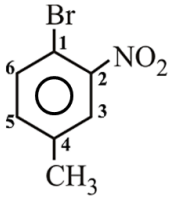
∴ Ans. (1)

75. **Ans (4)**

Fact

Ans. (4)

76. **Ans (2)**



1-Bromo-4-methyl-2-nitro benzene

∴ Ans. is (2)

77. **Ans (3)**

Fact

Ans. is (3)

78. **Ans (3)**

He = $1s^2$ - max I.E. in P.T.

82. **Ans (3)**

due to absence of vacant d orbital

83. **Ans (3)**

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84. **Ans (3)**

$w = -P_{ext}(V_2 - V_1)$

$= -1(10 - 5) \times 101.3$ J

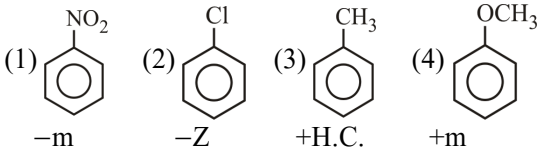
≈ -505 J

85. **Ans (3)**

Oxidation number of all the components of an alloy are zero.

86. **Ans (4)**

reactive towards electrophilic attach α + m, +Z, +H, −m, −Z.



(1) NO_2 (2) Cl (3) CH_3 (4) OCH_3

−m −Z +H.C. +m

electron density = (4) > (3) > (2) > (1)

∴ Ans. is (4)

87. **Ans (3)**

Total $[H^+] = [H^+]_{SA} + [H^+]_{H_2O}$

$= 2 \times 10^{-8} + 10^{-7}$

$= 2 \times 10^{-8} + 10 \times 10^{-8}$

$= 10^{-8}(2 + 10)$

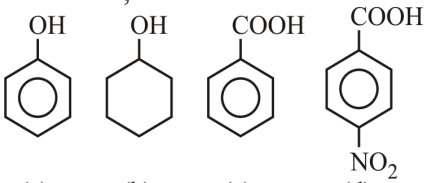
$[H^+] = 12 \times 10^{-8}$

$pH = 8 - \log 12 = 6.92$

88. **Ans (4)**

K_a = −COOH > Ph−OH > R−OH

$K_a \propto \frac{-m, -I}{+m, +I}$



(a) Phenol (b) Aliphatic alcohol (c) (d) Carbonylic acid

−m

∴ K_a = d > c > a > b

89. **Ans (1)**

Fact

∴ Ans. (1)

90. **Ans (1)**

fact

Ans. is (1)

91. **Ans (3)**

NCERT XI, Pg # 6

92. **Ans (4)**

NCERT XI, Pg # 13

94. **Ans (2)**

NCERT-XI, Pg.# 90,91

95. **Ans (4)**

NCERT XI Page # 27,28

97. **Ans (4)**
NCERT Pg # 17,18

98. **Ans (2)**
NCERT Pg. # 138

99. **Ans (2)**
NCERT Pg. # 141

101. **Ans (4)**
NCERT Pg. # 134, 147, 150

102. **Ans (1)**
NCERT, Pg # 160

104. **Ans (2)**
NCERT Page No. 241

105. **Ans (4)**
NCERT-XI, Page No. 249

106. **Ans (2)**
NCERT, Pg # 100,101

116. **Ans (2)**
NCERT-XI, Pg. # 74

117. **Ans (2)**
Module

121. **Ans (2)**
NCERT-XI, Pg. # 106

123. **Ans (3)**
NCERT XI Pg. # 14

125. **Ans (4)**
NCERT pg. # 32

126. **Ans (1)**
NCERT-XI, Pg. # 33, Fig, 3.4 (C)

127. **Ans (3)**
NCERT-XII Pg # 33

128. **Ans (1)**
NCERT-XI, Pg. # 150

129. **Ans (2)**
NCERT, Pg. # 234

130. **Ans (2)**
NCERT XI Pg # 175

131. **Ans (1)**
NCERT XI Pg. No. # 95,97,98,100

132. **Ans (3)**
NCERT page 165

133. **Ans (1)**
NCERT-XI, Pg # 127

135. **Ans (3)**
NCERT-XI Page No. # 118

136. **Ans (2)**
NCERT Pg # 38

141. **Ans (4)**
NCERT XI Pg. # 103

151. **Ans (4)**
Module

152. **Ans (1)**
Module

154. **Ans (2)**
NCERT, Pg. # 108, 114, 117

155. **Ans (4)**
NCERT Pg. # 116 (E), 118 (H)

159. **Ans (1)**
NCERT XI Pg. # 195-196

168. **Ans (2)**
NCERT XI Page No. # 59

171. **Ans (2)**
NCERT (XI) Pg # 284

172. **Ans (1)**
NCERT Pg. # 284-285

174. **Ans (4)**
NCERT Page # 210-211

178. **Ans (2)**
NCERT Page No. 338