CLASSROOM CONTACT PROGRAMME
(Academic Session : 2024 - 2025)

ENTHUSIAST ADVANCE COURSE
PHASE : MEA, B, C, D, L, M, N, O, P & Q
TARGET : PRE MEDICAL 2025

Test Type : **MAJOR** Test Pattern : **NEET (UG)**

TEST DATE : 22-12-2024

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	3	2	3	3	4	1	1	3	1	2	2	3	1	2	1	3	2	1	1	2	3	3	3	1	4	3	3	4	4
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.	3	2	3	2	4	3	3	4	1	4	2	3	2	3	3	1	1	3	3	1	1	3	2	3	3	4	3	3	2	1
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.	1	3	4	3	3	3	2	3	2	3	1	3	1	3	2	2	4	2	4	3	2	2	4	3	1	3	1	2	3	2
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.	2	4	3	1	2	4	2	2	2	2	2	3	4	2	2	3	3	3	4	3	2	1	2	1	4	1	2	1	4	2
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.	4	4	2	2	4	1	4	1	1	2	1	2	1	2	3	1	4	1	3	1	1	4	1	4	3	1	1	4	4	3
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.	2	3	3	2	1	1	2	4	2	4	1	1	3	4	3	2	4	4	3	1	3	4	1	4	2	1	4	4	2	4
Q.	181	182	183	184	185	186	187	188	189	190	191	192	193	194	195	196	197	198	199	200										
A.	2	1	3	3	2	1	2	3	2	4	1	2	2	2	3	4	4	4	4	3										

HINT – SHEET

SUBJECT : PHYSICS

SECTION-A

1. Ans (3)

2.3056 ⟶ 4 decimals

10.138 ⟶ 3 decimals

−7.4671 ⟶ 4 decimals

4.9765

Answer should have 3 decimals.

(2) $2.38 \times 1.0 = 2.38$ ⟶ answer should have 2 significant digits

(3) $\frac{8.05}{3.1} = 2.59 \approx 2.6$ answer should have 2SD

(4) $1.11 - 0.1 = 1.01 \approx 1.0$ but is an intermediate step so we keep 1 digit extra.

$1.01 \times 9.0 = 9.09 \approx 9.1$ ⟶ both 1.01 and 9.0 have 2SD

2. Ans (3)

If L be the length of the lake and the velocity of boat is V, time taken in going and coming back on a quiet day

$t_Q = \frac{L}{V} + \frac{L}{V} = \frac{2L}{V}$ ...(i)

Now, if υ is the velocity of air-current, then time taken in going across the lake,

$t_1 = \frac{L}{V + \upsilon}$ (as the current helps the motion)

and time taken in coming back,

$t_2 = \frac{L}{V - \upsilon}$ (as the current opposes the motion)

So, $t_R = \frac{2LV}{V^2 - \upsilon^2}$ $t_1 + t_2 = \frac{2L}{V\left[1 - \left(\frac{\upsilon}{V}\right)^2\right]}$ ...(ii)

Hence, from eqns. (i) and (ii),

$\frac{t_R}{t_Q} = \frac{1}{1 - (\upsilon/V)^2} > 1$

$\left[\because 1 - \left(\frac{\upsilon}{V}\right)^2 < 1\right]$ $\therefore$ $t_R > t_Q$.

3. Ans (2)

$\vec{a}_{avg} = \dfrac{10\hat{j} - 10\hat{i}}{10}$

$\vec{a}_{avg} = \hat{j} - \hat{i}$

$\vec{a}_{avg} = \sqrt{2}\,m/s^2$ N – W

4. Ans (3)

Least count (LC) = $\left(\dfrac{b-a}{b}\right)$ MSD ;

here a = 9,

b = 10 ; 1 MSD = 1 mm

$$LC = \left(\frac{10-9}{10}\right) 1 \text{ mm} = 0.1 \text{ mm}$$

There is zero error in measurement.

As the zero of the vernier lies to the left of the main scale, it has negative zero error. For negative zero error, the coinciding division is to be read from right and it has 5^{th} division coinciding from right.

Thus zero error = ZE = -5×0.1 mm = -0.5 mm = -0.05 cm

Reading at measurement : MSR = 8.5 cm

VSR = 8^{th} VSD × 0.1 mm = 0.08 cm

Corrected reading = MSR+VSR × LC – zero error

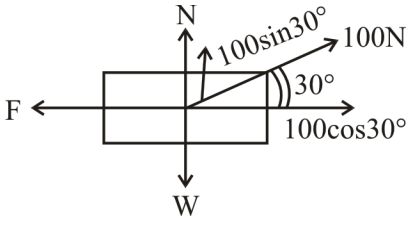
= 8.5 cm + 0.08 cm – (−0.5mm) = 8.63 cm

5. Ans (3)

$v' \sin\theta = v$

$v' = \dfrac{v}{\sin\theta}$

6. Ans (4)



Balancing in F = 100 cos30°

Balancing in W= N + 100 sin30°

$\Rightarrow$ W > N & N$\geq$ 0

7. Ans (1)

Impulse = Δp = Area of force-time graph

$$m(v_2 - v_1) = \frac{1}{2} \times 2 \times 10 + 3 \times 10 + \frac{1}{2} \times 5 \times 10 + 10 \times 5 + 2 \times 10 + \frac{1}{2} \times 3 \times 10$$

$2(v - 0) = 10+30+25+50+20+15$

v = 75 m/sec

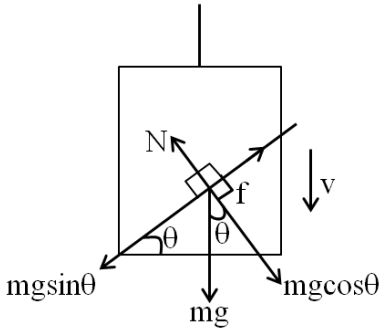
8. Ans (1)

$f_{lim} = 0.3\,(10 - 4) = 1.8$ N

F_{app} along x direction in 1N

So friction = 1N in −ve x direction $\vec{f} = -\hat{i}$N

9. Ans (3)



Block is at rest so

$f = mg\sin\theta$

$W_f = |f|\,|s| \cos(90 + \theta)$

$W_f = (mg \sin\theta)\,(vt)\,(-\sin\theta)$

$W_f = -mg \sin^2\theta\,(vt)$ [$\because$ s = vt]

$W_f = -mg\,vt \sin^2\theta$

10. Ans (1)

$a = v\dfrac{dv}{ds} = \dfrac{k^2}{2}$

$v = at = \dfrac{k^2 t}{2}$

$W_{ALL} = \Delta K.E. = \dfrac{1}{2}m\left(\dfrac{k^2 t}{2}\right)^2 = \dfrac{1}{8}mk^4t^2$

11. Ans (2)

Energy loss = $\dfrac{1}{2}(0.5)(14)^2 - (0.5)(9.8)(9)$

= 4.9 J

12. Ans (2)

$F = -\frac{dU}{dr}$

$F = \frac{2B}{r^3} - \frac{3A}{r^4}$

For equilibrium

$F = 0$

$\frac{2B}{r^3} = \frac{3A}{r^4}$

$r = \frac{3A}{2B}$

13. Ans (3)

MSR = 5.5 mm

$LC = \frac{0.5mm}{50} = 0.01mm$

Corrected reading = MSR + VSR − ZE

= 5.5mm + 36 × 0.01mm −(−0.03)mm

= 5.89mm

14. Ans (1)

Kinetic energy is given by

$E = \frac{1}{2}mv^2 = \frac{1}{2m}(mv)^2$

but mv = momentum of the particle = p

$\therefore E = \frac{p^2}{2m}$ or $p = \sqrt{2mE}$

Therefore, $\frac{P_1}{P_2} = \sqrt{\frac{m_1E_1}{m_2E_2}}$

but it is given that $p_1 = p_2$

$\therefore m_1E_1 = m_2E_2$

or $\frac{E_1}{E_2} = \frac{m_2}{m_1}$ …(i)

Now $m_1 > m_2$

or $\frac{m_1}{m_2} > 1$ …(ii)

Thus, Eqs. (i) and (ii) give

$\frac{E_1}{E_2} < 1$

or $E_1 < E_2$

Alternate Method (II)

$k = \frac{p^2}{2m} = E$

If p same $E \propto \frac{1}{m}$

$m_1 > m_2 \Rightarrow E_1 < E_2$

15. Ans (2)

$v_2 = ev_1$

$\Rightarrow \sqrt{2gh_2} = e\sqrt{2gh_1}$

$\Rightarrow e = \sqrt{\frac{h_2}{h_1}} = \sqrt{\frac{4}{16}} = \frac{1}{2}$

16. Ans (1)

$x_{cm} = \frac{A_1x_1 - A_2x_2}{A_1 - A_2}$

$A_1 = \pi(3R)^2 = 9\pi R^2$

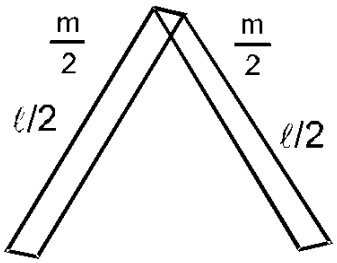
$A_2 = \pi R^2$

$x_1 = 0, x_2 = 2R$

$x_{cm} = \frac{0 - \pi R^2 \times 2R}{9\pi R^2 - \pi R^2}$

$x_{cm} = -\frac{R}{4}$

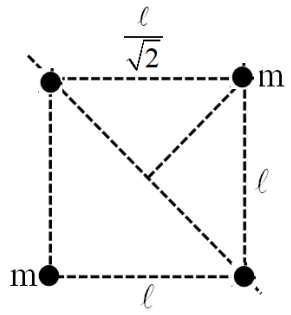
17. Ans (3)



$I_0 = I_1 + I_2$

$I_0 = \frac{(m/2)\left(\frac{\ell}{2}\right)^2}{3} + \frac{(m/2)\left(\frac{\ell}{2}\right)^2}{3} = \frac{m\ell^2}{12}$

18. Ans (2)



$I = m\left(\frac{\ell}{\sqrt{2}}\right)^2 \times 2 = m\ell^2$

19. Ans (1)

$I = \frac{2}{5} MR^2$

$MR^2 = \frac{5}{2} I$ ....(i)

M.I. about tangent

$I' = \frac{7}{5}MR^2 = \frac{7}{5} \times \frac{5}{2}I$

$I' = \frac{7}{2} I$

20. Ans (1)

$\frac{1}{2} \times 4 \times (4)^2 = \frac{1}{2} \times 64 \times v^2$

$v = 1$ m/s

21. Ans (2)

$V_\infty = \sqrt{V^2 - V_{es}^2}$

$= \sqrt{49V_e^2 - V_e^2}$

$= \sqrt{48V_e^2} = \sqrt{48}\, V_e = \sqrt{16 \times 3}\, V_e$

$= V_e = 4\sqrt{3}\, V_e$

22. Ans (3)

$Y = \frac{F \times \ell}{A \times \Delta\ell}$ $\qquad Y_A = Y_B$ $\quad F_A = F_B$

$\frac{\Delta\ell_A}{\Delta\ell_B} \propto \frac{\ell}{A} \propto \frac{\ell}{r^2}$

$\frac{\Delta\ell_A}{\Delta\ell_B} = \frac{\ell_A}{\ell_B} \times \frac{r_B^2}{r_A^2}$

$= \frac{1}{2} \times \left(\frac{\sqrt{2}}{1}\right)^2 = 1$

23. Ans (3)

$F = \frac{Y \times A \times \Delta\ell}{\ell}$

$= \frac{2 \times 10^{11} \times 3 \times 10^{-6} \times 1 \times 10^{-3}}{4}$

$F = \frac{3}{2} \times 10^2$ N

$W = \frac{1}{2} \times F \times \Delta\ell$

$= \frac{1}{2} \times \frac{3}{2} \times 10^2 \times 1 \times 10^{-3} = 0.075$ J

24. Ans (3)

Surface tension acts perpendicular to the imaginary line, so it is line which defines direction of force and not surface tension, hence it is a scalar quantity, also it does not obeys vector laws.

25. Ans (1)

$F = \left(\frac{AY}{L}\right) x$

slope $= \frac{AY}{L} \propto A$

26. Ans (4)

$\frac{\text{Stress}}{\text{Strain}} = Y =$ slope of graph

$\therefore \frac{Y_A}{Y_B} = \frac{\tan 60}{\tan 30} = 3$

$\therefore Y_A = 3Y_B$

27. Ans (3)

$B = \frac{\Delta P}{-\Delta V / V}$

$\Delta P = B(-\Delta V/V)$

$h\rho g = B(-\Delta V/V)$

$h \times 10^3 \times 9.8 = (9.8 \times 10^8) \times (0.1 \times 10^{-2})$

$h = 100$ m

28. Ans (3)

$W = Th$

Case-1 :

$\sigma v g = \rho_w \frac{2v}{3} g$

$\sigma = \frac{2}{3}\rho_w$

σ = density of body

Case-2 :

$\sigma v g = \rho_\ell \frac{v}{4} g$

$\rho_\ell = 4\sigma = 4 \times \frac{2}{3}\rho_w$

$\rho_\ell = \frac{8}{3}$ g/cc

29. Ans (4)

$$h = \frac{2T\cos\theta}{r\rho g} = \frac{(2)(50)\left(\cos 0^0\right)}{(0.05)(0.8)(1000)} = 2.5 \text{ cm}$$

$$h' = \frac{h}{\cos 60^o} = \frac{2.5 \text{ cm}}{1/2} = 5 \text{ cm}$$

30. Ans (4)

Viscosity in liquids arises due to intermolecular forces of attraction.

As temperature increases intermolecular force of attraction decreases and hence viscosity of liquids also decreases.

31. Ans (3)

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

Here r and η unchanged

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

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

32. Ans (2)

$$F = \eta A \frac{dv}{dz}$$

33. Ans (3)

$$\omega_h = \frac{2\pi}{12 \times 60 \times 60}$$

$$\omega_s = \frac{2\pi}{60}$$

$$\frac{\omega_h}{\omega_s} = \frac{1}{720}$$

34. Ans (2)

$$\theta = \frac{\left(\omega_i + \omega_f\right)t}{2}$$

$$2\pi N = \frac{(20\pi + 40\pi)}{2}10$$

N = 150 revolution

35. Ans (4)

$T_0 = m\omega^2\ell$

$T' = m(2\omega)^2(2\ell) = 8\, m\omega^2\ell = 8T_0$

SECTION-B

36. Ans (3)

In the diagram, zero of the vernier scale lies to the right of zero of main scale. So it has positive zero error.

N = 0, Third division of vernier scale is coinciding with the main scale division.

$\therefore$ zero error

$= N + 3 \times L.C = 0 + 3 \times 0.01$

$= 0.03$ cm

So zero correction = -0.03 cm.

That means, actual length will be 0.03 cm less than the measured length

37. Ans (3)

$$\rho = \frac{M}{V}$$

$$\rho = \frac{M}{L^3}$$

$$\frac{\Delta\rho}{\rho} \times 100 = \frac{\Delta M}{M} \times 100 + 3\frac{\Delta L}{L} \times 100$$

$= 3\% + 3(2\%) = 9\%$

38. Ans (4)

In retardation $\vec{v}$ and $\vec{a}$ both are in opposite direction.

39. Ans (1)

$$D = 2 \times 1 \text{ cm} + 5 \times \frac{10 - 9}{100} \text{ cm} = 2.05 \text{ cm}$$

40. Ans (4)

$$\text{Least count} = \frac{0.5\text{mm}}{50} = 0.01\text{mm}$$

In figure (A): ZE = $-$ (5×0.01) mm = -0.05 mm

In figure (B) for measurement:

MSR = 6.5 mm

CSR = 26 × 0.01 mm = 0.26 mm

Corrected reading

= 6.5 mm + 0.26 mm $-$ (-0.05) mm

= 6.81 mm

41. Ans (2)

$F_g = F_{CP}$

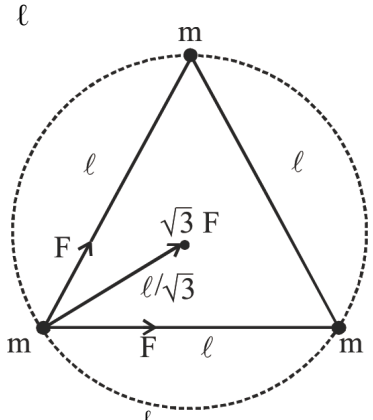
$$\frac{GMm}{r^n} = \frac{mv_0^2}{r} \Rightarrow v_0^2 = \frac{GM}{r^{n-1}}$$

$$v_0 = \sqrt{\frac{GM}{r^{n-1}}}$$

42. Ans (3)

$$\frac{mV^2}{\frac{\ell}{\sqrt{3}}} = \frac{\sqrt{3}Gm^2}{\ell^2}$$

$$V = \sqrt{\frac{Gm}{\ell}}$$



$$T = \frac{2\pi r}{V} = \frac{2\pi \times \frac{\ell}{\sqrt{3}}}{\sqrt{\frac{Gm}{\ell}}}$$

$\boxed{T \propto \ell^{3/2}}$

43. Ans (2)

$$\text{Stress} = \frac{T}{A}$$

$$= \frac{M}{L}\frac{(L-x)}{A}g$$

$$\text{stress} = \frac{Mg}{A} - \frac{Mg}{LA}x$$

44. Ans (3)

$B = W_{air} - W_{water} = 5 - 2 = 3$ N

45. Ans (3)

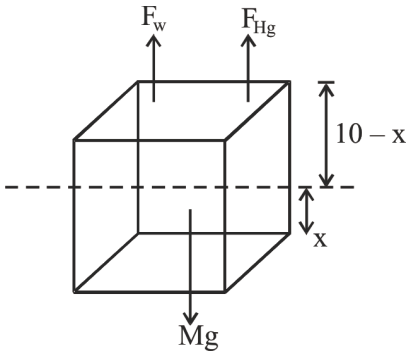
$$P = \rho_w g \frac{h}{2} + r_{oil}\, g \frac{h}{2}$$

$$P = \left(1 \times \frac{5 \times 100}{2} + 0.85 \times \frac{500}{2}\right)g$$

$$= 462.5\ g\ \frac{\text{dyne}}{cm^2}$$

$$= 462.5\ \frac{g.wt}{cm^2}$$

46. Ans (1)



$F_w + F_{Hg} = Mg$

$\rho_w g V_w + \rho_{Hg} g V_{Hg} = \rho_B V_B g$

$V_w = 10 \times 10 \times (10 - x)$

= displace volume of water

$V_{Hg} = 10 \times 10 \times (x)$

= displaced volume of mercury

10^3 g

$\rho_w = 10^3$ kg/m^3

$\rho_{Hg} = 13.6 \times 10^3$ kg/m^3

$\rho_B = 8.56 \times 10^3$ kg/m^3

so solving

x = 6 cm

47. Ans (1)

Experimental

48. Ans (3)

$$h = \frac{2T\cos\theta}{r\rho g} = \frac{(2)(0.465)(\cos 135^o)}{\left(10^{-3}\right)\left(13.6 \times 10^3\right)(9.8)}$$

= 5mm

49. Ans (3)

diameter $d_1 = 3.0 \times 10^{-3}$m , $d_2 = 6.0 \times 10^{-3}$ m

In one limb $h_1 = \frac{4T}{d_1\rho g}$ and in other limb $h_2 = \frac{4T}{d_2\rho g}$

$$\Delta h = h_1 - h_2 = \frac{4T}{\rho g}\left[\frac{1}{d_1} - \frac{1}{d_2}\right]$$

$$= \frac{(4)\left(72 \times 10^{-3}\right)}{10^3 \times 10}\left[\frac{1}{3} - \frac{1}{6}\right] \times 10^3$$

$$\Delta h = \frac{(4)(72)}{6} \times 10^{-4}\text{m}$$

$= 4.8 \times 10^{-3}$m = 4.8mm

50. **Ans (1)**

$\omega = \omega_0 + \alpha t$

$-\omega_0 = \alpha t$

$-\frac{1200 \times 2\pi}{60} = 120\ \alpha \quad \Rightarrow -\frac{\pi}{3} = \alpha$

angular decelearation = $-\ \alpha$

$= -(-\pi/3)$

$= +\frac{\pi}{3}\text{rad/sec}^2$

SUBJECT : BOTANY

SECTION-A

51. **Ans (1)**
NCERT-XI, Pg # 9

52. **Ans (3)**
NCERT-XI, Pg. # 4

53. **Ans (2)**
NCERT-XI, Pg. # 7

54. **Ans (3)**
NCERT-XI, Pg. # 9

55. **Ans (3)**
Module

56. **Ans (4)**
NCERT-XI, Pg. # 21

57. **Ans (3)**
NCERT-XI, Pg. # 21

58. **Ans (3)**
NCERT-XI, Pg. # 21

59. **Ans (2)**
NCERT-XI, Pg. # 21

60. **Ans (1)**
NCERT-XI, Pg. # 23, 24

61. **Ans (1)**
NCERT-XI, Pg. # 26-27

62. **Ans (3)**
NCERT-XI, Pg. # 32

63. **Ans (4)**
NCERT-XI, Pg. # 28-29

64. **Ans (3)**
NCERT-XI, Pg. # 29

65. **Ans (3)**
NCERT-XI, Pg. # 26, 25

66. **Ans (3)**
NCERT-XI, Pg. # 33

67. **Ans (2)**
NCERT-XI, Pg. # 29

68. **Ans (3)**
NCERT-XI, Pg. # 90

69. **Ans (2)**
NCERT-XI, Pg. # 99,100

70. **Ans (3)**
NCERT-XI, Pg. # 101

71. **Ans (1)**
NCERT-XI, Pg. # 97

72. **Ans (3)**
NCERT-XI, Pg. # 88

73. **Ans (1)**
NCERT-XI, Pg. # 95

74. **Ans (3)**
NCERT-XI, Pg. # 100

75. **Ans (2)**
NCERT-XI, Pg. # 121,125

76. **Ans (2)**
NCERT-XI, Pg. # 127

77. **Ans (4)**
NCERT-XI, Pg. # 124

78. **Ans (2)**
NCERT-XI, Pg. # 127

79. **Ans (4)**
NCERT-XI, Pg. # 165,169, 170

80. **Ans (3)**
NCERT-XI, Pg. # 106

81. **Ans (2)**
NCERT-XI, Pg. # 148

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

83. **Ans (4)**
NCERT-XI, Pg. # 116

84. **Ans (3)**
NCERT-XI, Pg. # 117

85. **Ans (1)**
NCERT-XI, Pg. # 118

SECTION-B

86. **Ans (3)**
NCERT-XI, Pg. # 9, 11

87. **Ans (1)**
NCERT-XI, Pg. # 29

88. **Ans (2)**
NCERT-XI Pg.# 9

89. **Ans (3)**
NCERT-XI, Pg. # 27

90. **Ans (2)**
NCERT-XI, Pg. # 25

91. **Ans (2)**
NCERT-XI, Pg. # 30

92. **Ans (4)**
b, c and d are correct
NCERT-XI, Pg. # 38

93. **Ans (3)**
NCERT-XI, Pg. # 98

94. **Ans (1)**
NNCERT-XI, Pg. # 98

95. **Ans (2)**
NCERT-XI, Pg. # 96

96. **Ans (4)**
NCERT-XI, Pg. # 126

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

98. **Ans (2)**
NCERT-XI, Pg. # 109

99. **Ans (2)**
NCERT-XI, Pg. # 108

100. **Ans (2)**
NCERT-XI, Pg. # 115

SUBJECT : ZOOLOGY

SECTION-A

107. **Ans (3)**
NCERT(XIth) Pg.#57, IInd para

108. **Ans (3)**
NCERT Pg.#56

109. **Ans (4)**
NCERT XI Pg# 51,53

110. **Ans (3)**
NCERT XII, Page no. # 52, 50

112. **Ans (1)**
NCERT-XI, Pg. # 101, Para - 6

113. **Ans (2)**
NCERT-XII, Pg. # 79

116. **Ans (1)**
NCERT XI, Pg. No. 120

117. **Ans (2)**
NCERT XI, Pg. No. 116

119. **Ans (4)**
NCERT Pg. # 114

120. **Ans (2)**
NCERT-XI, Pg. # 112 [Old NCERT]

121. **Ans (4)**
NCERT XIth, Pg 113 (E), 113(H)

126. **Ans (1)**
NCERT-XI, Pg. # 289

128. **Ans (1)**
NCERT XI , Pg.# 275

129. Ans (1)

NCERT XI Pg # 273, 274

130. Ans (2)

NCERT, Pg # 270

131. Ans (1)

NCERT Pg. # 282

SECTION-B

141. Ans (1)

NCERT Pg # 48

148. Ans (4)

NCERT Pg. # 115

149. Ans (4)

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SUBJECT : CHEMISTRY

SECTION-A

151. Ans (2)

$q_v = -20$ Kcal

$\Delta n_g = 3 - 5 = -2$

$\Delta H = \Delta E + \Delta n_g RT$

$\Delta H = (-20) + (-2) \times \frac{2 \times 500}{1000}$

$\Delta H = -22$ Kcal

152. Ans (3)

(A) When liquid evaporates to vapour, randomness increases hence entropy increases.

(B) Temperature decreases $\Rightarrow$ entropy decreases

(C) $\Delta n_g = 2 - 0 = 2$

$\Delta n_g = +$ ve $\longrightarrow \Delta S = +$ ve

$\Rightarrow$ entropy increases

(D) $\Delta n_g = 2 - 1 = 1$

$\Delta n_g = +$ve $\longrightarrow \Delta S = +$ ve

$\Rightarrow$ entropy increases

(A), (C), (D) are correct.

155. Ans (1)

According to graph, $[A]_{eq} = 0.1$ M

$[B]_{eq} = 0.4$ M

$K_c = \frac{[B]^2}{[A]} = \frac{0.4 \times 0.4}{0.1} = 1.6$

160. Ans (4)

Due to common ion effect s'

$= \frac{K_{sp}}{[Cl^-]} = \frac{1.8 \times 10^{-10}}{2 \times 10^{-2}} = 0.9 \times 10^{-8}$

162. Ans (1)

For NaOCN

$pH = 7 + \frac{1}{2} pKa + \frac{1}{2} \log C$

and

$[OH^-] = \sqrt{\frac{k_w \times C}{K_a}} = \sqrt{\frac{10^{-14} \times 10^{-2}}{10^{-4}}} = 10^{-6}$

165. Ans (3)

$mol = \frac{6 \times 10^{23}}{6 \times 10^{23}} = 1$

$mol = \frac{5.6}{22.4} = \frac{1}{4} = 0.25$

$mol = \frac{1.8}{18} = 0.1$

mol = 0.2 mol

166. Ans (2)

$\frac{1}{\lambda} = R(1)^2 \left[\frac{1}{(1)^2} - \frac{1}{(3)^2}\right]$

$\frac{1}{\lambda} = \frac{8R}{9}$

$\lambda = \frac{9}{8R}$

167. Ans (4)

$m_\alpha = 4 \times m_p \quad q_\alpha = 2 \times q_p \quad \lambda = \frac{h}{\sqrt{2mqv}}$

169. Ans (3)

$_{29}Cu \longrightarrow 1s^2 2s^2 2p^6 3s^2 3p^6 4s^2 3d^9$

to obtain stability

$\longrightarrow 1s^2 2s^2 2p^6 3s^2 3p^6 4s^1 3d^{10}$

valence shell $\longrightarrow 4s^1$

$n = 4$

$\ell = 0$

$m = 0$

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

172. Ans (4)

$NH_4Cl \Rightarrow NH_4^+ + Cl^-$

$NH_4^+ \Rightarrow$ covalent and coordinate

$NH_4^+ \vdots\vdots\vdots Cl^- \Rightarrow$ ionic bond.

174. Ans (4)

Lattice energy $(U_0) \propto \frac{|z^+| . |z^-|}{r_0}$

175. Ans (2)

NCERT-XI, Pg # 105, Part-I

176. Ans (1)

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177. Ans (4)

In group 13 due to transition contraction

[Al > Ga]

178. Ans (4)

C < N < O < F

Left to right electronegativity increases.

179. Ans (2)

A. No. = 11 belongs to 7^{th} period.

180. Ans (4)

Br_2 and Br_2 are non-polar diatomic molecules in which there are weak London dispersion forces.

181. Ans (2)

$SOCl_2 \longrightarrow sp^3 \longrightarrow$ Triangular pyramidal

$XeOF_4 \longrightarrow sp^3d^2 \longrightarrow$ Square pyramidal

$S_3^{-2} \longrightarrow sp^3 \longrightarrow$ V-Shape

$BF_4^- \longrightarrow sp^3 \longrightarrow$ Tetrahedral

182. Ans (1)

$\Delta H_{eg} \Rightarrow [3^{rd}$ period > 2^{nd} period]

183. Ans (3)

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184. Ans (3)

SiO_2 = network solid

$\therefore$ high mp

185. Ans (2)

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SECTION-B

188. Ans (3)

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189. Ans (2)

$N_2(g) + 2H_2(g) \longrightarrow N_2H_4(g)$

$\Delta_f H\ (N_2H_4, g)$

$= (941 + 2 \times 436) - (159 + 4 \times 398)$

$= 1813 - 1751 = 62\ kJ\ mol^{-1}$

191. Ans (1)

$CH_3COOH + NaOH \rightleftharpoons CH_3COONa + H_2O$

1 mole	0.5 mole	0	0
0.5	0	0.5	excess

$pH = pKa + \log \frac{[CH_3COONa]}{[CH_3COOH]}$

$= 5 - \log 2 + \log \frac{0.5}{0.5}$

$= 5 - 0.3$

$= 4.7$

192. Ans (2)

$MnO_4^- + 5Fe^{+2} + 8H^+ \longrightarrow Mn^{+2} + 5Fe^{+3} + 4H_2O$

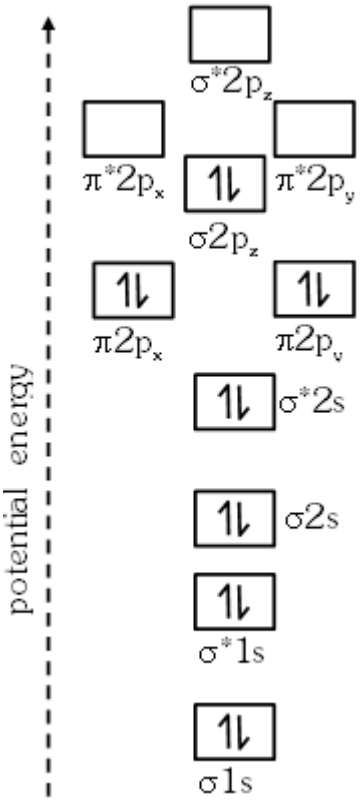
195. Ans (3)

C^{4-} N^{3-} O^{2-} $Mg^{+2} = 10e^-$

$C^{4-} > N^{3-} > O^{2-} > Mg^{+2}$

196. Ans (4)

Molecular orbital (energy) diagram / sequence of N_2



197. Ans (4)

For isoelectronic species

Ionic Radius $\propto \frac{1}{Z_{eff}}$

198. Ans (4)

All the alkali metals are highly reactive elements since they have a strong tendency to lose the single valence s-electron to form unipositive ions having inert gas configuration. This reactivity arises due to their low ionization enthalpies and high negative values of their standard electrode potentials.

However, the reactivity of halogens decreases with increase in atomic number due to following reasons.

(a) As the size increases, the attraction for an additional electron by the nucleus becomes less.

(b) Due to decrease in electronegativity from F to I, the bond between halogen and other elements becomes weaker and weaker.

199. Ans (4)

(a) Ca^{2+} Pb^{2+} $\longrightarrow$ (charge same)

$\downarrow$ $\downarrow$

$8e^-$ $(18 + 2)\ e^-$

ϕ order = $(18 + 2)\ e^- > 8e^-$

(b) Na^{+1} Cu^{+1} $\longrightarrow$ (charge same)

$\downarrow$ $\downarrow$

$8e^-$ $18\ e^-$

ϕ order = $18e^- > 8e^-$

(c) Sn^{2+} Sn^{4+} $\longrightarrow$ (atom same)

+ve charge $\uparrow$ $\phi\uparrow$

$\Rightarrow$ ϕ order $\Rightarrow$ $Sn^{2+} < Sn^{4+}$

(d) $Al^{3+} < Mg^{2+}$

+ve charge $\Rightarrow$ $Al^{3+} > Mg^{2+}$

ϕ order $\Rightarrow$ $Al^{3+} > Mg^{2+}$

200. Ans (3)

B_2 BO = 1 B.....π.....B

H_2^+, total $e^- = 1 \Rightarrow$ B.O = 0.5

$N_2^{-2} \Rightarrow 16\ e^- \Rightarrow$ unpaired $e^- = 2 \Rightarrow$ paramagnetic

$Be_2 \Rightarrow$ total e = 8, BO = 0 $\Rightarrow$ so does not exist