ANSWER KEY FOR MAJOR TEST- 05 (FOR 2023 ASPIRANTS) 14th Aug 2022

1. (2)	2. (1)	3. (2)	4. (1)	5. (1)
6. (3)	7. (4)	8. (4)	9. (2)	10. (1)
11. (2)	12. (1)	13. (1)	14. (4)	15. (1)
16. (2)	17. (3)	18. (4)	19. (3)	20. (3)
21. (1)	22. (3)	23. (3)	24. (4)	25. (3)
26. (1)	27. (2)	28. (2)	29. (1)	30. (3)
31. (3)	32. (1)	33. (4)	34. (2)	35. (4)
36. (1)	37. (4)	38. (2)	39. (4)	40. (3)
41. (3)	42. (2)	43. (3)	44. (4)	45. (1)
46. (2)	47. (1)	48. (4)	49. (2)	50. (3)
51. (3)	52. (2)	53. (4)	54. (3)	55. (3)
56. (3)	57. (4)	58. (1)	59. (3)	60. (4)
61. (1)	62. (1)	63. (4)	64. (2)	65. (3)
66. (2)	67. (1)	68. (4)	69. (3)	70. (2)
71. (4)	72. (2)	73. (3)	74. (4)	75. (3)
76. (3)	77. (2)	78. (1)	79. (2)	80. (1)
81. (2)	82. (2)	83. (1)	84. (1)	85. (1)
86. (3)	87. (3)	88. (1)	89. (2)	90. (1)
91. (2)	92. (1)	93. (1)	94. (4)	95. (3)
96. (1)	97. (2)	98. (3)	99. (4)	100. (2)
101. (2)	102. (3)	103. (1)	104. (4)	105. (3)
106. (2)	107. (1)	108. (3)	109. (3)	110. (4)
111. (4)	112. (3)	113. (1)	114. (4)	115. (3)
116. (4)	117. (3)	118. (4)	119. (4)	120. (1)
121. (3)	122. (2)	123. (4)	124. (2)	125. (2)
126. (2)	127. (1)	128. (2)	129. (4)	130. (1)
131. (2)	132. (4)	133. (1)	134. (3)	135. (4)
136. (2)	137. (2)	138. (2)	139. (1)	140. (4)
141. (1)	142. (1)	143. (1)	144. (4)	145. (4)
146. (4)	147. (3)	148. (3)	149. (4)	150. (3)
151. (3)	152. (3)	153. (1)	154. (3)	155. (1)
156. (3)	157. (4)	158. (2)	159. (2)	160. (3)
161. (4)	162. (2)	163. (1)	164. (3)	165. (2)
166. (4)	167. (2)	168. (4)	169. (2)	170. (4)
171. (3)	172. (1)	173. (2)	174. (3)	175. (2)
176. (4)	177. (2)	178. (4)	179. (1)	180. (4)
181. (4)	182. (2)	183. (2)	184. (4)	185. (1)
186. (2)	187. (3)	188. (1)	189. (1)	190. (3)
191. (1)	192. (1)	193. (1)	194. (3)	195. (1)
196. (4)	197. (1)	198. (2)	199. (1)	200. (3)

Solutions

1. (2)

$V = 10axy$

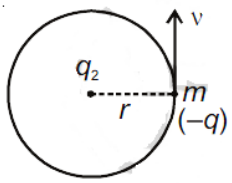
$E_x = \frac{-dV}{dx} = -10ay, E_y = \frac{-dV}{dy} = -10ax$

$\vec{E} = -10a(y\hat{i} + x\hat{j})$

2.

Sol. Answer (1)

$$\frac{mv^2}{r} = \frac{1}{4\pi\varepsilon_0}\cdot\frac{q_1 q_2}{r^2}$$



$$v = \left[\frac{1}{4\pi\varepsilon_0}\frac{q_1 q_2}{rm}\right]^{\frac{1}{2}}$$

For 1 trip

$$T = \frac{2\pi r}{v} = 2\pi r\left[4\pi\varepsilon_0 mr\right]\left[q_1 q_2\right]^{\frac{1}{2}}$$

$$T = \sqrt{\frac{16\pi^3\varepsilon_0 mr^3}{q_1 q_2}}$$

3. (2)

$$V = \frac{9\times10^9\times2\times10^{-8}\times\frac{1}{2}}{9} = 10V$$

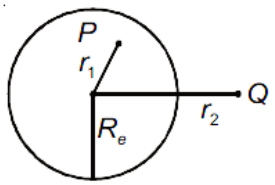
4.

Answer (1)

$M_e \rightarrow$ Mass of earth

$R_e \rightarrow$ Radius of earth

The acceleration due to gravity at a distance r_1 from the centre of earth such that $r_1 < R$,



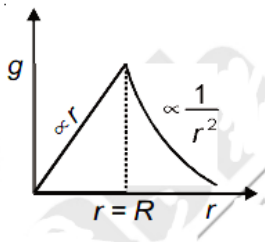
is given by $gr_1 = \frac{GM}{R^3}r_1$

$\Rightarrow g \propto r$

The acceleration due to gravity at a distance r_2 from the centre of earth such that $r_2 > R$,

is given by $gr_2 = \frac{GM}{r_2^2}$

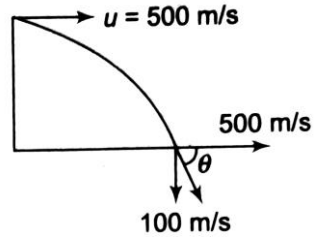
$\Rightarrow g \propto \frac{1}{r^2}$



5. (1)

Horizontal component of velocity $\upsilon_x = 500\text{m/s}$ and vertical components of velocity while striking the ground.

$\upsilon_y = 0 + 10 \times 10 = 100\text{m/s}$



$\therefore$ Angle with which it strikes the ground,

$$\theta = \tan^{-1}\left(\frac{v_y}{v_x}\right) = \tan^{-1}\left(\frac{100}{500}\right) = \tan^{-1}\left(\frac{1}{5}\right)$$

6. (3)

$$\omega_{old} = \sqrt{\frac{k_{old}}{m}}$$

When divided into 3 parts the spring constant of smaller parts

$\therefore k_{final} = 3k_{old}$

$\therefore \omega_{final} = \sqrt{3}\omega_{old}$

$\omega = 2\pi\nu$

Hence $\nu_{final} = \sqrt{3}\nu_{old} \Rightarrow \nu_2 = \sqrt{3}\nu_1$

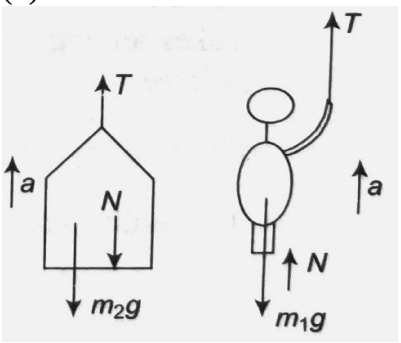
7. (4)

(1) Action and reaction act on the different bodies.

(2) Example : Gravitational force, coulomb force

(3) 3rd law is irrespective of the state of motion

8. (4)



$M_1 = 100\text{kg}, m^2 = 50\text{kg}, a = 5\text{m/s}^2$

$T + N - m_1 g = m_1 a$

$T - N - mg = m_2 a$

Solving these :

T = 1125 N and

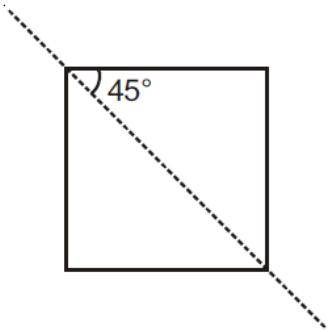
N = 375 N

9. (2)

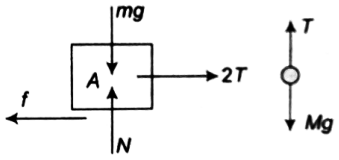
$$I = 4\left(\frac{mL^2 \sin^2 45^\circ}{3}\right)$$

$$= \frac{4mL^2}{6}$$

$$= \frac{2}{3}mL^2$$



10. (1)



$f = 2T$ (i)

and $T = Mg$ (ii)

If m be at rest friction will be static

$f \le \mu N$

$$2Mg \le \mu mg \Rightarrow M = \frac{\mu g}{2}$$

11. (2)

$$W - q(V_f - V_i) = -q(V_\infty - V_i) = +qV_i$$

$$V_i = 8.\frac{kq^2}{r} = \frac{8q^2}{4\pi\varepsilon_0 r}$$

$$W = \frac{+8q^2}{4\pi\varepsilon}$$

12. (1) In the given problem, conservation of linear momentum and energy hold good.
Conservation of momentum yields.

$$m_1v_1 + m_2v_2 = 0$$

or $4v_1 + 0.2v_2 = 0$ (i)

Conservation of energy yields

$$\frac{1}{2}m_1v_1^2 + \frac{1}{2}m_2v_2^2 = 1050$$

Or $\frac{1}{2}\times 4v_1^2 + \frac{1}{2}\times 0.2\times v_2^2 = 1050$

Or $2v_1^2 + 0.1v_2^2 = 1050$ (ii)

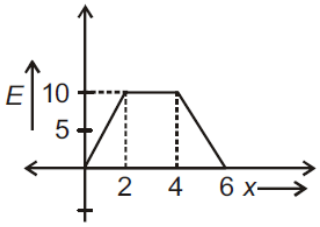
Solving Eqs. (i) and (ii), we have
v_1 = 100 m/s

13.

Answer(1)

$V_2 - V_6 = -\int E dr$

$V_2 - V_6 = (10)(2) + \frac{1}{2}(10)(2) = 30$



14. Sol. Answer (4)
Resultant force act along OB

15. (1)
Lens formula

$\frac{1}{v} - \frac{1}{u} = \frac{1}{f}$

Object is real and placed at $-\frac{f}{2}$

$\frac{1}{v} + \frac{2}{f} = \frac{1}{f} \Rightarrow \frac{1}{v} = \frac{-1}{f}$

$v = -f$

16. (2)

$F_N = -q.\frac{kQx}{(x^2 + r^2)^{\frac{3}{2}}}$

For SHM

$F \propto (-x)$

17. (3)
Surface energy = surface tension × area of film × number of free surface

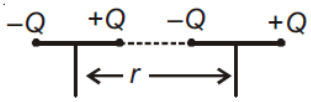
$= 5 \times 0.02 \times 2$

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

18.

Sol. Answer (4)

$F = \frac{K\,6P_1P_2}{r^4}$



19.

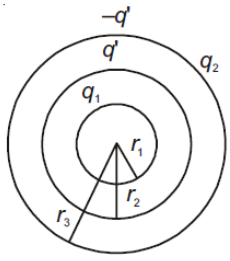
Answer (3)

Suppose a guassian surface passes through conducting shell with radius (r_3)

Flux through it well be zero. So, net charge enclosed must be zero.

$\therefore q_1 + q' = 0$

$q' = -q_1$

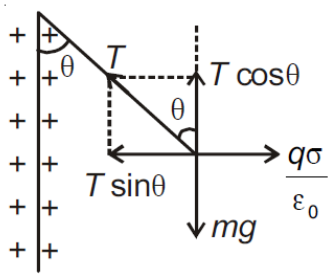


20. Sol. Answer (3)

21.

Sol. Answer (1)

$$\frac{T\sin\theta}{T\cos\theta}=\frac{q\sigma/\varepsilon_0}{mg}$$



$$\tan\theta=\frac{q\sigma}{\varepsilon_0 mg}$$

$$\sigma=\frac{\varepsilon_0 mg\tan\theta}{q}$$

22. (3)

(magnification) $m=\dfrac{f}{f-u}$

Focal real image m = –n

$$-n=\frac{-f}{-f-u}$$

$$\Rightarrow u=-\frac{f(n+1)}{u}$$

23.

Sol. Answer (3)

$$\phi_{\text{Total}}[\text{of 6 surface}]=\frac{q}{\varepsilon_0}$$

$$\phi_{\text{One surface}}=\frac{q}{6\varepsilon_0}$$

24. (4)

Water should be poured such that shift in depth of image is 1 cm

$$\left(d-\frac{d}{\mu}\right)=1$$

$$d\left(1-\frac{3}{4}\right)=1$$

$$d=4\text{cm}$$

25. (3)

Charge with maximum curved path has highest charge to mass ratio.

26. (1)

$$P_1 = \frac{1}{0.2} \text{ and } P_2 = -\frac{1}{0.2}$$

Powers : $= 5D \text{ and } -5D$

Net power $= 0$

$\therefore$ Focal length $= \frac{1}{0} = \infty$

27. (2)

$$k = \frac{1}{2}mv^2 + \frac{1}{2}l\omega^2$$

$$= \frac{1}{2}mv^2 + \frac{1}{2}\frac{ml^2}{2}.\frac{v^2}{l^2}$$

$$= \frac{3}{4}(2)(2)^2$$

$$= 6J$$

28. (2)

$v = \omega\sqrt{A^2 - x^2}$ $\qquad$ $\frac{v^2}{\omega^2} + x^2 = A^2 \Rightarrow \frac{v^2}{\omega^2 A^2} + \frac{x^2}{A^2} = 1$

This is the equation of an ellipse.

29. (1)

Let, M = mass of man, m = mass of boy

V = speed of man, v = speed of boy

Given : $\frac{1}{2}MV^2 = \frac{1}{2}\left(\frac{1}{2}mv^2\right), \text{As } m = \frac{M}{2}$

So $\frac{1}{2}MV^2 = \frac{1}{2}\left(\frac{1}{2} \times \frac{M}{2}v^2\right)$

Hence, $v^2 = 4V^2$ or $v = 2V$

When the man speeds up by 1 m/s, then we get

$$\frac{1}{2}M(V+1)^2 = \frac{1}{2}mv^2 = \frac{1}{2}\frac{M}{2}\left(4V^2\right)$$

or $(V+1)^2 = 2V^2 \text{ or } V^2 - 2V - 1 = 0$

Solving we get: V = 2.4 ms^{-1} and $v = 2V = 4.8^{-1}$

30. (3)

Suppose V be velocity at the end of inclined plane.

Then, $Fs = mgh - \frac{1}{2}mV^2$

Or $F \times 8 = 25 \times 9.8 \times 5 - \frac{1}{2} \times 25 \times 7^2$

Solving we get F = 76.6 N.

31.

Answer (3)

$$V_{terminal} = \frac{2a^2}{9\eta}(\rho - \sigma)g$$

Where
ρ = density of material
σ = density of liquid

$$\Rightarrow V_T \propto (\rho - \sigma)$$

$$\Rightarrow \frac{V_{T_1}}{V_{T_2}} = \frac{\rho_{gold} - \sigma_{liquid}}{\rho_{silver} - \sigma_{liquid}}$$

Given,
$V_{T_1} = 0.2$ m/s
$V_{T_2} = V =$?
$\rho_{gold} = 19.5$ kg/m^3
$\sigma_{liquid} = 1.5$ kg/m^3
$\rho_{silver} = 10.5$ kg/m^3

$$\Rightarrow \frac{0.2}{V} = \frac{19.5 - 1.5}{10.5 - 1.5}$$

$$\Rightarrow V = 0.1 \text{ m/s}$$

32. (1)

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

$$x = \frac{3}{4}A$$

$$v = \omega\sqrt{A^2 - \frac{9A^2}{16}}$$

$$v = \omega A\sqrt{\frac{7}{16}}$$

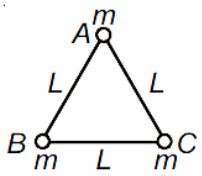
$$\text{or } v = v_0\sqrt{\frac{7}{4}} \text{ as } (v_0 = A\omega)$$

33.

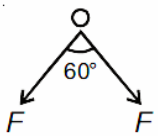
Answer (4)

At this moment,

Forces acting on particle at A can be shown,



where, $F = \frac{Gm^2}{L^2}$



$\Rightarrow$ Net force will be resultant of both,

$$F_{resultant} = \sqrt{F^2 + F^2 + 2F^2\cos 60^\circ} = \sqrt{3}\,F$$

$$\Rightarrow F_{resultant} = \frac{\sqrt{3}\,Gm^2}{L^2}$$

$$a = \frac{F}{m} = \frac{\sqrt{3}\,Gm}{L^2}$$

34. (2)

Total energy $= \frac{1}{2}kA^2$

When P.E. is half of total energy P.E. = K.E.

$\Rightarrow \frac{1}{2}kx^2 = \frac{1}{2}k(A^2 - x^2)$

$x^2 = A^2 - x^2 \Rightarrow 2x^2 = A^2$

$x = \frac{A}{\sqrt{2}}$

35. (4)

$\text{Av.Power} = \frac{\frac{1}{2}mv^2}{t} = \frac{\frac{1}{2}\times 1000\times(15)^2}{5} = 22500\text{W}$

36. (1)

Work is done when we break a drop into 'n' drops equal to $4\pi R^2\sigma(n^{1/3}-1)$

So energy will be liberated if we merge back those drops.

37.

Answer (4)

Rate of flow $\propto$ pressure difference $\times$ (radius)^4

$Q \propto P \times a^4$ $\quad \left\{\because \quad Q = \frac{\pi P r^4}{8\eta L}\right\}$

So, $\frac{Q_1}{Q_2} = \frac{P_1 a_1^4}{P_2 a_2^4}$

$\frac{Q_1}{Q_2} = \frac{P\times a^4}{4P\times\left(\frac{a}{4}\right)^4} = \frac{64}{1}$

$\therefore \quad Q_2 = \frac{Q_1}{64} = \frac{Q}{64}$

38. (2)

According to Kepler's Law of areas, $V_A < V_P$

V_A = Speed of planet at aphelion

V_P = Speed of planet at perihelion

Now, work done by gravitational force of sun

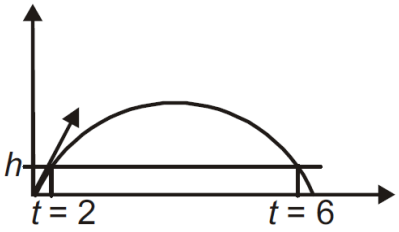
$= \Delta\text{K.E} = \frac{1}{2}m\left(v_A^2 - v_P^2\right)$

$\Rightarrow W_{\text{gravitation force}}$ is negative.

39. (4)

Average velocity of the projectile when it is at the same vertical height is : u cos θ

$\Rightarrow 80\times\cos 30^{o} \Rightarrow 40 ms^{-1}$



40. (3)

$f_0 = 100$ cm

$f_e = 5$ cm

To form image at near point

$$m = -f_0\left[\frac{1}{f_e}+\frac{1}{D}\right]$$

$$= -100\left[\frac{1}{5}+\frac{1}{25}\right]$$

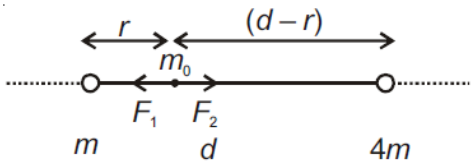
$$= -100\left[\frac{6}{25}\right]$$

$$m = -24$$

41.

Answer (3)

Force of gravitation on m_0 due to $m = \frac{Gmm_0}{r^2} = F_1$



Force of gravitation on m_0 due to $4m = \frac{G4mm_0}{(d-r)^2} = F_2$

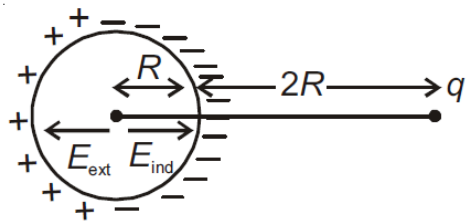
42.

Answer (2)

$$\vec{E}_{int} + \vec{E}_{ext} = 0$$

$$\vec{E}_{int} = \vec{E}_{ext}$$

$$\vec{E}_{int} = \frac{kq}{9R^2}$$



43.

Answer (3)

$g = \frac{GM}{R^2}$

$g' = \frac{GM}{(0.985\,R)^2}$

$g' = (1.0306)\frac{GM}{R^2}$

$\Rightarrow \quad g' = 1.0306\,g$

$\Rightarrow$ Acceleration changes by $\frac{\Delta g}{g} \times 100 = +3\%$

Alternate method:

$g' = \frac{GM}{(R+\Delta R)^2}$

$g' = GM(R+\Delta R)^{-2}$

$g' = \frac{GM}{R^2}\left(1+\frac{\Delta R}{R}\right)^{-2}$

for $\frac{\Delta R}{R} \ll 1$, we can use binomial and approximately,

$g' = \frac{GM}{R^2}\left(1-\frac{2\Delta R}{R}\right)$

$\Rightarrow \quad g' = g - g\frac{2\Delta R}{R}$

$\Rightarrow \quad \frac{\Delta g}{g} = \frac{-2\Delta R}{R} = -2\times\left(\frac{-1.5}{100}\right) = \frac{+3}{100} = 3\% \quad [g' - g = \Delta g]$

44. (4)

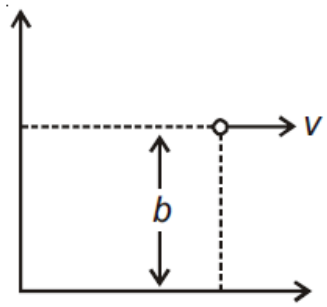
$\ell = \pi R \qquad \Rightarrow R = \frac{\ell}{\pi}$

$I = \frac{mr^2}{2}$

$I = \frac{1}{2}m\left(\frac{\ell}{\pi}\right)^2 \qquad \Rightarrow I = \frac{m\ell^2}{2\pi^2}$

45.

Answer (1)



$|L| = mbv$

46. Sol. Answer (2)

By breaking capillaries as they do not allow water to seep inside.

47. (1)

Body of smaller $\frac{K^2}{R^2}$ will take less time so solid sphere will reach the ground first.

48. (4)

$V_T = 90 kmh^{-1} = 90 \times \frac{5}{18} = 25 ms^{-1}$

$V_m = ?$

$d = speed \times time$

$d_{net} = V_{net} \times t$

$1 = (V_m - 25) \times 1$

$V_m = 26 ms^{-1}$

49. Sol. Answer (2)

The dimensional formula of energy

$E = [ML^2T^{-2}]$

So, dimensions of (i) Mass $\rightarrow$ 1 (ii) Length $\rightarrow$ 2 (iii) Time $\rightarrow$–2

50. (3)

Using Newton's third law, bullet will apply the same force in the opposite direction.

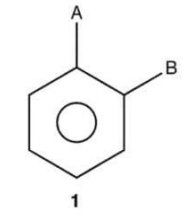
So, using $F = ma = \frac{10}{1000} \times 3 \times 10^6 \times 10^{-2} = 300N$

51. (3)

For a cyclic process the net change in the internal energy is zero because the change in internal energy does not depend on the path.

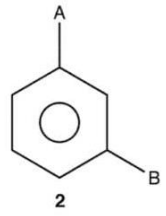
52.

The number of isomers possible for disubstituted benzene is 3.



1

ortho disubstituted benzene



2

meta disubstituted benzene

3

para disubstituted benzene

53. (4)

$\lambda = \frac{h}{mv} = \frac{6.6 \times 10^{-34}}{60 \times 10^{-3} \times 10} = 10^{-33} m$

54. (3)

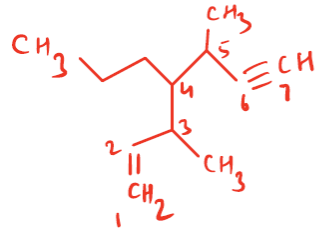
$CH_2 = CH_2 (g) + H_2 (g) \rightarrow CH_3 - CH_3$

$\Delta H = 1(C = C) + 4 (C - H) + 1 (H - H) - 1 (C - C) - 6 (C - H)$

$= 1 (C = C) + 1 (H - H) - 1 (C - C) - 2 (C - H)$

$= 615 + 435 - 347 - 2 \times 414 = 1050 - 1175 = - 125 kJ.$

55. (3)



3, 5 - Dimethyl - 4 - propyl hept - 1 - en - 6 - yne

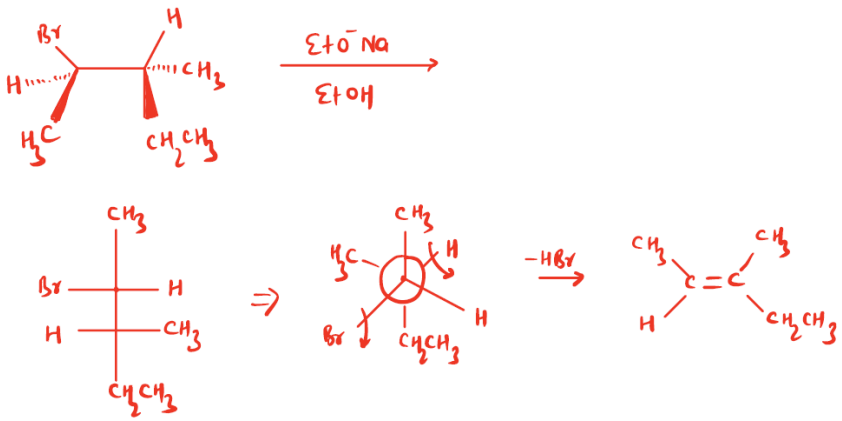
Answer (3)

56. (3)
$Fe^{+2} = 3d^6.4s^0$

57. (4)
Acidic hydrogen & weeker leaving group $\Rightarrow$ E' CB favorable

58. (1)
For s-electron, $\ell = 0 \therefore$ angular momentum = zero

59. (3)



60. (4)
$[A] = 1.0 \times 10^{-5}$, $[B] = [1.0 \times 10^{-5}]$,
$K_{sp} = [2.B]^2 [A] = [2 \times 10^{-5}]^2 [1.0 \times 10^{-5}]$
$= 4 \times 10^{-15}$

61. (1)
Sulphur is the leost E.N in given species so its more nuclophile. So,

62. (1)
No. of moles of boron
$= \frac{21.6}{10.8} = 2 \text{ for } BCl_3$
$\therefore$ 1mole of Boron = 3 mole of Cl
$\therefore$ 2 mole of Boron = 6 mole of Cl
$H_2 + Cl_2 \rightarrow 2HCl$
$\Rightarrow$ 3moles of Hydrogen is required
$= 3 \times 22.4 = 67.2$Litre

63. (4)

Better bone, better nucleophile

So Acidic strength ↑ conjugate bone ↓ nucleophilicity ↓

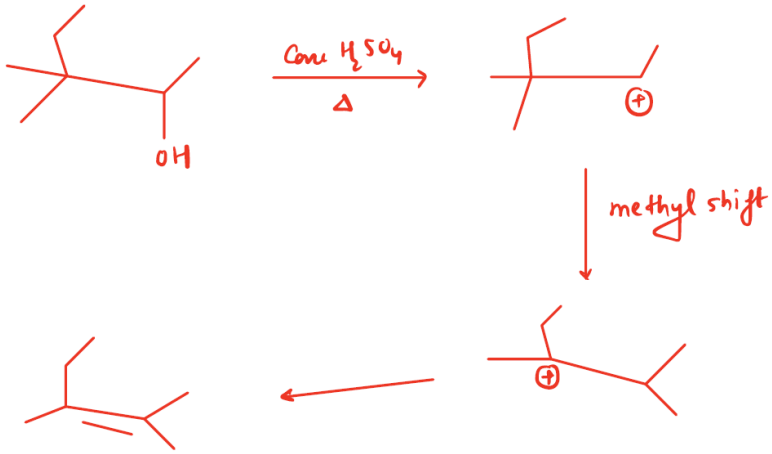
Then order is –

$C_6H_5COO^{\ominus} < C_6H_5O^{\ominus} < OH^{\ominus} < CH_3O^{\ominus}$

64. (2)

$$K_C = \frac{[NO_2]^2}{[N_2O_4]} = \frac{[1.2\times10^{-2}]^2}{[4.8\times10^{-2}]} = 3\times10^{-3}\,mol/L$$

65. (3)

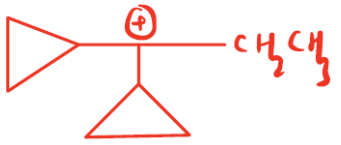


66. (2)

Due to exothermicity of reaction low or optimum temperature will be required. Since 3 moles are changing to 2 moles.

∴High pressure will be required.

67. (1)



most stable carbocation in all options.

(Stabilise through dancing resonance)

Answer : (1)

68. (4)

Na_2O (basic), SO_2 and B_2O_3 (acidic) and ZnO is Amphoteric

69. (3)

Weeker base, better leaving group

70. (2)
Among the given compounds, the NH_3 is most basic. Hence has highest proton affinity

71. (4)
Weeker base, better leaving group

72. (2)
f-block elements show a regular decrease in atomic size due to lanthanide/actinide contraction.

73. (3)

More stable carbocation, more rate of reaction

& leaving group ability of $Br^{\ominus} > Cl^{\ominus}$

so,

rate of reaction order is -

$R_1 > R_3 > R_2$

74. (4)
$25 \times N = 0.1 \times 35$; $N = 0.14 \therefore M = 0.07$ M
$Ba(OH)_2$ is diacid base

75. (3)
$\Delta G^\circ = -RT \ln K_c$ or $-\Delta G^\circ = RT \ln K_c$

76. (3)

EWG ↑ stability of carbocation ↓

ERG ↑ stability of carbocation ↑

77. (2)
Enthalpy change for a reaction does not depend upon the nature of intermediate reaction steps.

78. (1)

more conjugation, more stable carbocation

&

no. of α-hydrogen ↑ stability of carbocation ↑

79. (2)
Both NO_2 and O_3 have angular shape and hence will have net dipole moment.

80. (1)
N^{3-}, F^- and Na^+ contain 10 electrons each.

81. (2)
$5d^8$, square planar. Others are tetrahedral

82. (2)
In H_2S, due to low electronegativity of sulphur the L.P. - L. P. repulsion is more than B. P. - B. P. repulsion and hence the bond angle is 92°.

83. (1)
Both XeF_2 and CO_2 have a linear structure.

84. (1)
Spectrochemical series

85. (1)
The lines falling in the visible region comprise Balmer series. Hence the third line would be $n_1 = 2$, $n_2 = 5$ i.e. $5 \rightarrow 2$

86. (3)
lanthanide contraction

87. (3)
In ether, there is no H-bonding while alcohols have intermolecular H-bonding

88. (1)
For spontaneous reaction, $dS > 0$ and ΔG and dG should be negative i.e. < 0.

89. (2)
According to kinetic theory the gas molecules travel in a stright line path but show haphazard motion due to collisions.

90. (1)
On increasing pressure, the temperature is also increased. Thus in pressure cooker due to increase in pressure the b.p. of water increases.

91. (2)

The ratio of number of moles will be the same as the ratio of volume. According to Dalton's low, the partial pressure of a gas in a mixture is given by the product of its volume fraction and the total pressure. Therefore, the equilibrium pressure of each gas is,

$$P_{NH_3} = \frac{9.6}{100} \times 50atm = 4.8atm$$

$$P_{N_2} = \frac{22.6}{100} \times 50atm = 11.3atm$$

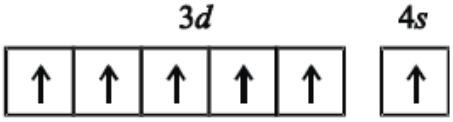
$$P_{H_2} = \frac{\frac{67.6}{100} \times 50atm = 33.9atm}{\text{Total pressure} = 50atm}$$

$$K_P = \frac{[P_{NH_3}]^2}{[P_{N_2}][P_{H_2}]^3}; \text{Substituting the values of partial pressures,}$$

$$K_P = \frac{(4.80atm)^2}{(11.3atm)(33.9atm)^3} = 5.23 \qquad 10^{-5}\ atm^{-2}$$

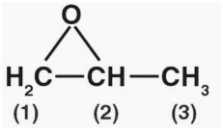
92. (1)

Electronic configuration of Cr is



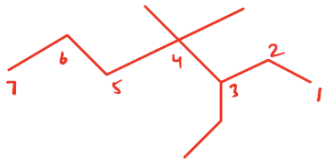
So due to half filled orbital I.P. is high of Cr.

93.



1,2-Epoxy propane

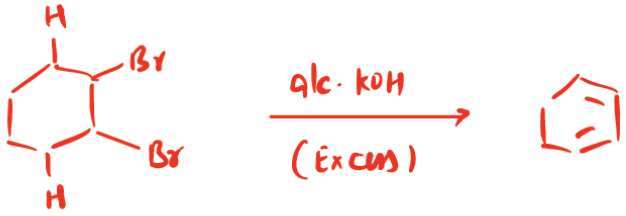
94. (4)



3-Ethyl-4,4-dimethyl heptane

Answer (4)

95. (3)

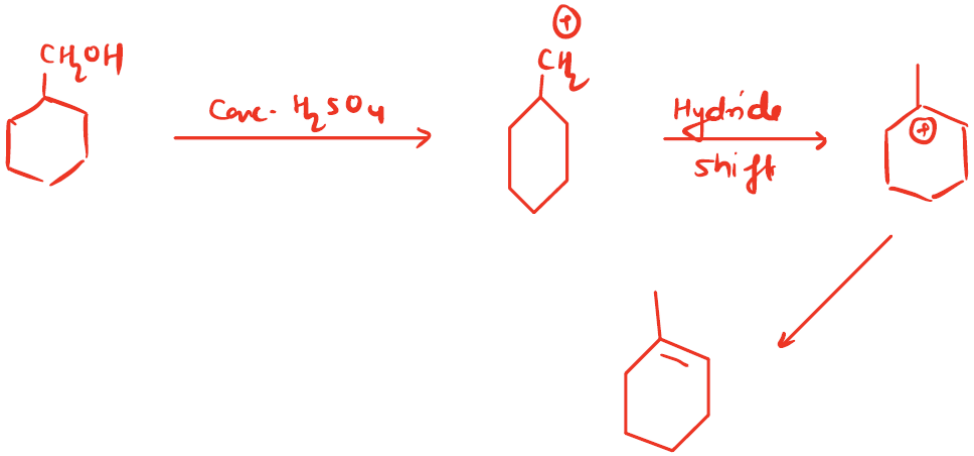


Elimination reaction.

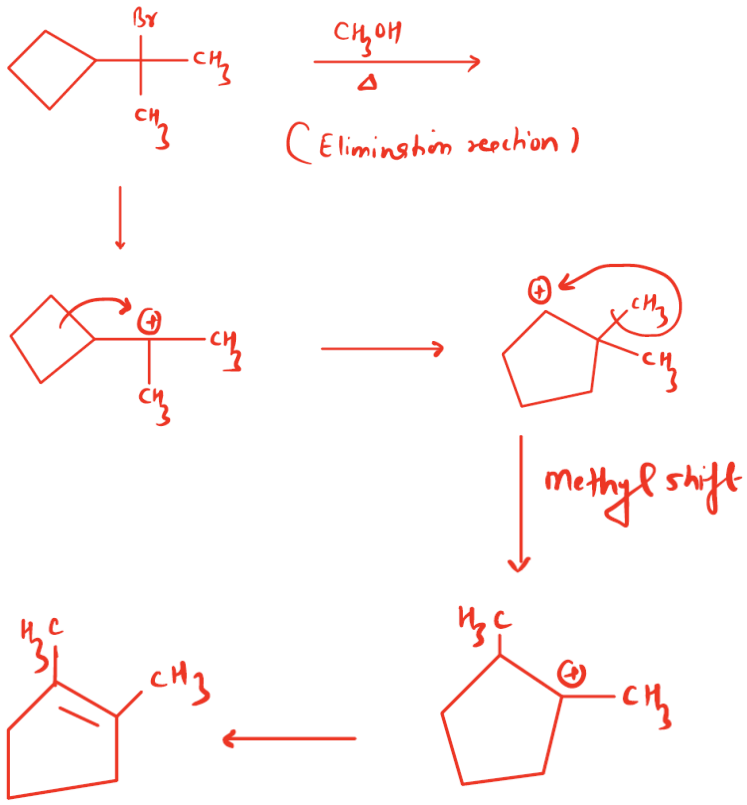
96. (1)

If -H & -Br in antiperiplanar then reaction will be faster. So,

97. (2)



98. (3)



99. (4)

More stable carbocation, more rate of reaction of E^1

& leaving group ability of $I^- > Br^-$

100. (2)

no. of α - hydrogen ↑ stability of carbocation ↑

Answer : (2)

101. NCERT XI Pg 78-81

102. NCERT XII Pg. 174

103. Genotypic ratio of Dihybrid cross is
1 : 2 : 1 : 2 : 4 : 2 : 1 : 2 : 1

104. NCERT XII Pg 33

105. AAbb × aaBB = AaBb
AaBb × aabb = Test cross
∴ Ratio = 1 : 1 : 1 : 1

106. AABb × aaBb

	AB	Ab
aB	AaBB	AaBb
ab	AaBb	Aabb

107. 1 KREB Cycle = 3NADH + H^+ + 1$FADH_2$
Via ETS, 1 NADH + H+ = 3ATP
1 $FADH_2$ = 2ATP
∴via 1 KREB CYCLE = 11 ATP

108. NCERT Pg. 177

109. NCERT XII Pg 183

110. NCERT XII Pg. 91

111. NCERT XII Pg 175

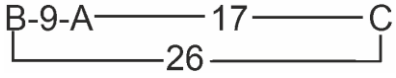
112. MMC = 2n = 10 chromosomes
Aleurone = 3n = 15 chromosomes

113. NCERT Pg 172

114. NCERT Pg. 175,176

115. NCERT Pg. 89-91

116. A – B : 9% ; A – C : 17% ; B – C : 26%



117. NCERT Pg. 174

118. NCERT Pg. 233

119. NCERT Pg 79

120. Genotypic ratio of Dihybrid cross is
1 : 2 : 1 : 2 : 4 : 2 : 1 : 2 : 1

121. NCERT Pg. 176

122. NCERT Pg. 186

123. NCERT Pg 79

124. Yellow Round : Yellow wrinkled : Green round : Green wrinkled
9 : 3 : 3 : 1
Total seeds = 2560
Yellow Wrinkled = $\frac{2560\times3}{16}=480$
Yellow Round = $\frac{2560\times9}{16}=1440$
Green wrinkled = $\frac{2560\times1}{16}=16$

125. Rhizobium shows symbiotic nitrogen fixation with legumes

126. NCERT Pg 174, 175

127. Genotype : Aa Bb Xh
Gamete : 2^n : 23 : 8 [n = no. of heterozygous]
abX_h gamete : 1
$\therefore$ Correct answer = 1/8

128. Genotype of woman : X_{ch} X
Genotype of man : XY

	X_{ch}	X
X	XX_{ch}	XX
Y	$X_{ch}Y$	XY

129. NCERT Pg. 185

130. NCERT Pg. 79

131. NCERT Pg. 89-91

132. NCERT Pg. 181,183

133. NCERT Pg 188

134. NCERT Pg. 91,92

135. NCERT Pg. 86

136. NCERT XII Pg 92

137. For Obtaining Wall free / naked protoplast cellulose & pectinase are used

138. Offsprings : X_CY ; X_CX_C ; XY
Parent : X_CY & X_CX

139. NCERT XII Pg 89-91

140. NCERT Pg, 182

141. NCERT Pg 222

142. NCERT Pg 13

143. NCERT Pg. 26

144. NCERT Pg. 26

145. NCERT XI Pg 38

146. NCERT Pg 38

147. NCERT XI Pg 241

148. NCERT Pg. 214

149. NCERT Pg. 199

150. NCERT XI Pg. 31 & 43

151. XII NCERT pg 157

152. (3) XI NCERT pg 335

153. (1)
Vaccines are the artificial antigenic preparations which on administered in body produce immune response against it.

154. (3)
XII NCERT (Pg – 133, Fig. 7.5),(Pg – 131, Fig. 7.3) 2nd para,(Pg – 132, 2nd para)

155. XII NCERT pg 160. Nicotine is stimulant and hence addictive .

156. (3)
XII NCERT Pg – 140, last line

157. (4)
XII NCERT Page no – 147, 2nd para, 2nd line

158. (2)
Ascaris lumbricoides life cycle is monogenetic. Female Ascaris may produce approximately 200000 eggs per day, being a parasite they show high rate of reproduction.

159. (2)
luteal stage occurs after ovulation.

160. XII NCERT pg 60. They are introduced into the vagina to cover cervix. They do not act as spermicidal agents but their efficiency is increased when coated with spermicides.

161. (4) NCERT Pg – 153, 4^{th} para, 5^{th} line.

162. DCT is for conditional reabsorption of Na. DL of LOH is impermeable to salts.

163. (1) The viral genome (RNA) is unstable which keeps on mutating

164. (3)
Entamoeba ,Trypanosoma and *Plasmodium* are all protozoans .

165. XII NCERT pg 150. ,1^{st} para, last line. Chikungunya spreads though female *Aedes* mosquito.

166. (4)
XII NCERT, Pg. 134, Table – 7.7

167. XII NCERT pg 153. SCID-genetic disorder

168. XII NCERT pg 60. Condoms are non reusable.

169. (2)
XII NCERT Pg – 138, Fig – 7.9

170. (4)
Hardy Weinberg equation $\rightarrow p^2 + 2pq + q^2 = 1$
Where p is the frequency of 'A' allele =0.6 and q is the frequency of 'a' allele =0.4.
Therefore Heterozygous members=2pq = 0.48

171. (3)
Amino acids and glucose are included under the category of primary metabolites as they have identifiable functions and play known roles in normal physiological processes. Rubber, gums, morphine, codeine, vinblastine and curcumin are the secondary metabolites as their role of functions in host organismis not known yet. However many of them are useful in human welfare.

172. XII NCERT pg 127, 128.

173. XII NCERT pg 131. Convergent evolution is seen in unrelated animals due to same habitat.

174. (3)
XII NCERT pg 156.When T_H cells count decrease below $200/mm^3$. The immune compromised condition arises called AIDS.

175. Modifications of organs through use & disuse or Inheritance of acquired characters was proposed by Lamarck. Appearance of sudden large variations inheritance and survival of those having these variations was proposed by Hugo de Vries.

176. XII NCERT Pg – 135, 3^{rd} para.

177. (2)

178. Life originated in Archaezoic era. Earth was formed about 4.5 billion years ago.Coacervates are non living molecular aggregates.

179. XII NCERT pg 60, 1st para, Lactating mother PRL is high that maintains corpus luteum , hence level of progesterone is high that gives negative feedback to gonadotropins.

180. XII NCERT pg 61.

181. (4)
Inspiration is initiated by the contraction of diaphragm, which increases the volume of thoracic chamber in the anterio-posterior axis. The contraction of external inter-coastal muscles lifts up the ribs and the sternum causing an increase in the volume of the thoracic chamber in the dorso-ventral axis.

182. XII NCERT pg 64, 2nd para.

183. XII NCERT pg 60, 61

184. XII NCERT pg 60,61. Vasectomy prevents sperms transport and not their formation.

185. XII NCERT pg 152, 2nd para, 4th line.

186. (2)
Rhino virus affects the upper Respiratory tract and not the lungs.

187. HIV causes AIDS. Ascariasis is not an STD ,*Entamoeba histolytica* Causes Amoebiasis.

188. XII NCERT pg 64.

189. XII NCERT pg 59, last para

190. Surrogate mother should be healthy to carry pregnancy of the child she is carrying of other biological parents.Biological mother is subjected to superovulation.

191. XII NCERT pg 58, 2nd line.

192. (1)
Recapitulation theory states ontogeny repeats phylogeny i.e. every organism during its development repeats in abbreviated form, the evolutionary history of its race.

193. XII NCERT pg 159

194. (3) Theory of natural selection – Darwin. Theory of Panspermia- Astronomers .Theory of inheritance of acquired characters – Lamarck

195. Platyhelminthes are bilaterally symmetrical, triploblastic and acoelomate animals with organ level of organisation.

196. (4)
XII NCERT Pg – 137, 2nd para, 2nd line.

197. Leukemia is a type of blood cancer, which is characterised by an uncontrolled increase in the number (through mitosis) of leucocytes in the blood.

198. (2)
Silicosis is an occupational disease caused due to excess inhalation of silica dust in the workers involved grinding or stone breaking industries.

199. (1)
NCERT Page no 147, 4^{th} para, 4^{th} line

200. (3)
Sphincter of Oddi is a type of smooth muscle valve that regulates the common hepato-pancreatic duct.