NEET ANSWER KEY & SOLUTION

PAPER CODE :- PART TEST-5
CLASS-XI

ANSWER KEY

PHYSICS

1.	(B)	**2.**	(A)	**3.**	(B)	**4.**	(C)	**5.**	(C)	**6.**	(D)	**7.**	(C)
8.	(A)	**9.**	(A)	**10.**	(D)	**11.**	(A)	**12.**	(D)	**13.**	(D)	**14.**	(A)
15.	(C)	**16.**	(C)	**17.**	(A)	**18.**	(B)	**19.**	(D)	**20.**	(A)	**21.**	(A)
22.	(A)	**23.**	(D)	**24.**	(D)	**25.**	(A)	**26.**	(C)	**27.**	(C)	**28.**	(C)
29.	(C)	**30.**	(B)	**31.**	(B)	**32.**	(A)	**33.**	(A)	**34.**	(D)	**35.**	(D)
36.	(D)	**37.**	(B)	**38.**	(C)	**39.**	(A)	**40.**	(A)	**41.**	(C)	**42.**	(B)
43.	(D)	**44.**	(A)	**45.**	(D)	**46.**	(D)	**47.**	(D)	**48.**	(A)	**49.**	(D)
50.	(D)												

CHEMISTRY

51.	(B)	**52.**	(A)	**53.**	(D)	**54.**	(C)	**55.**	(C)	**56**.	(C)	**57.**	(C)
58.	(C)	**59.**	(A)	**60.**	(D)	**61.**	(D)	**62.**	(B)	**63.**	(D)	**64.**	(D)
65.	(C)	**66.**	(A)	**67.**	(D)	**68.**	(C)	**69.**	(D)	**70.**	(A)	**71.**	(C)
72.	(B)	**73.**	(A)	**74.**	(C)	**75.**	(C)	**76.**	(C)	**77.**	(B)	**78.**	(A)
79.	(A)	**80.**	(D)	**81.**	(D)	**82.**	(C)	**83.**	(A)	**84.**	(A)	**85.**	(C)
86.	(A)	**87.**	(A)	**88.**	(C)	**89.**	(A)	**90.**	(D)	**91.**	(B)	**92.**	(C)
93.	(B)	**94.**	(B)	**95.**	(A)	**96.**	(B)	**97.**	(A)	**98.**	(D)	**99.**	(C)
100.	(C)												

BIOLOGY

101.	(B)	**102.**	(C)	**103.**	(B)	**104.**	(A)	**105.**	(D)	**106.**	(A)	**107.**	(A)
108.	(C)	**109.**	(C)	**110.**	(A)	**111.**	(A)	**112.**	(B)	**113.**	(A)	**114.**	(C)
115.	(B)	**116.**	(C)	**117.**	(B)	**118.**	(C)	**119.**	(D)	**120.**	(C)	**121.**	(B)
122.	(A)	**123.**	(A)	**124.**	(A)	**125.**	(A)	**126.**	(A)	**127.**	(D)	**128.**	(A)
129.	(D)	**130.**	(D)	**131.**	(B)	**132.**	(A)	**133.**	(D)	**134.**	(C)	**135.**	(D)
136.	(A)	**137.**	(D)	**138.**	(B)	**139.**	(B)	**140.**	(C)	**141.**	(C)	**142.**	(C)
143.	(D)	**144.**	(B)	**145.**	(C)	**146.**	(C)	**147.**	(B)	**148.**	(B)	**149.**	(B)
150.	(C)	**151.**	(A)	**152.**	(C)	**153.**	(C)	**154.**	(A)	**155.**	(C)	**156.**	(B)
157.	(D)	**158.**	(C)	**159.**	(B)	**160.**	(C)	**161.**	(B)	**162.**	(C)	**163.**	(D)
164.	(D)	**165.**	(B)	**166.**	(D)	**167.**	(C)	**168.**	(B)	**169.**	(D)	**170.**	(B)
171.	(D)	**172.**	(A)	**173.**	(B)	**174.**	(C)	**175.**	(D)	**176.**	(B)	**177.**	(C)
178.	(B)	**179.**	(B)	**180.**	(C)	**181.**	(D)	**182.**	(D)	**183.**	(D)	**184.**	(D)
185.	(A)	**186.**	(A)	**187.**	(B)	**188.**	(D)	**189.**	(C)	**190.**	(C)	**191.**	(C)
192.	(D)	**193.**	(C)	**194.**	(D)	**195.**	(C)	**196.**	(A)	**197.**	(B)	**198.**	(C)
199.	(C)	**200.**	(C)										

SOLUTIONS

PHYSICS

1. (B)

Sol. $x = a\cos(\omega t + \theta)$ ….(i)

and $v = \frac{dx}{dt} = -a\omega\sin(\omega t + \theta)$ ….(ii)

Given at $t = 0$, $x = 1\,cm$ and $v = \pi$ and $\omega = \pi$

Putting these values in equation (i) and (ii) we will get $\sin\theta = \frac{-1}{a}$ and $\cos\theta = \frac{1}{a}$

$\Rightarrow \sin^2\theta + \cos^2\theta = \left(-\frac{1}{a}\right)^2 + \left(\frac{1}{a}\right)^2$

$\Rightarrow a = \sqrt{2}\,cm$

2. (A)

Sol. Simple harmonic waves are set up in a string fixed at the, two ends.

3. (B)

Sol. $\frac{a_1}{a_2} = \frac{10}{25} = \frac{2}{5}$

4. (C)

Sol. It is given $v_{max} = 100\,cm/sec$, $a = 10\,cm$.

$\Rightarrow v_{max} = a\omega \Rightarrow \omega = \frac{100}{10} = 10\,rad/sec$

Hence $v = \omega\sqrt{a^2 - y^2} \Rightarrow 50 = 10\sqrt{(10)^2 - y^2}$

$\Rightarrow y = 5\sqrt{3}\,cm$

5. (C)

Sol. $v_{max} = \omega a = \frac{2\pi}{T} \times a$

$\Rightarrow v_{max} = \frac{2 \times \pi \times 2}{2} = 2\pi\ m/s$

6. (D)

Sol. $v_{max} = a\omega = \frac{a.2\pi}{T} = \frac{2\pi a}{T}$

7. (C)

Sol. $v = \omega\sqrt{a^2 - y^2} \Rightarrow 10 = \omega\sqrt{a^2 - (4)^2}$ and $8 = \omega\sqrt{a^2 - (5)^2}$

On solving $\omega = 2 \Rightarrow \omega = \frac{2\pi}{T} = 2 \Rightarrow T = \pi\,sec$

8. (A)

Sol. Velocity is same. So by using $v = a\omega$

$\Rightarrow A_1\omega_1 = A_2\omega_2 = A_3\omega_3$

9. (A)

Sol. $x = 3\sin 2t + 4\cos 2t$. From given equation $a_1 = 3, a_2 = 4,$ and $\phi = \frac{\pi}{2}$

$\therefore a = \sqrt{a_1^2 + a_2^2} = \sqrt{3^2 + 4^2} = 5$

$\Rightarrow v_{max} = a\omega = 5 \times 2 = 10$

10. (D)

Sol. $F = -kx$

11. (A)

Sol. Maximum acceleration $= A\omega^2 = A \times 4\pi^2 n^2$

$= 0.01 \times 4 \times (\pi)^2 \times (60)^2 = 144\,\pi^2 m/\sec$

12. (D)

Sol. $E = \frac{1}{2}m\omega^2 A^2 \Rightarrow E \propto A^2$

13. (D)

Sol. Let x be the point where K.E. = P.E.

Hence $\frac{1}{2}m\omega^2(A^2 - x^2) = \frac{1}{2}m\omega^2 x^2$

$\Rightarrow 2x^2 = A^2 \Rightarrow x = \frac{A}{\sqrt{2}} = \frac{4}{\sqrt{2}} = 2\sqrt{2}cm$

14. (A)

Sol. $F = -kx \Rightarrow dW = Fdx = -kxdx$

So $\int_0^W dW = \int_0^x -kx\,dx \Rightarrow W = U = -\frac{1}{2}kx^2$

15. (C)

Sol. $\frac{U}{U_{max}} = \frac{\frac{1}{2}m\omega^2 y^2}{\frac{1}{2}m\omega^2 a^2} \Rightarrow \frac{1}{4} = \frac{y^2}{a^2} \Rightarrow y = \frac{a}{2}$

16. (C)

Sol. Kinetic energy $K = \frac{1}{2}mv^2 = \frac{1}{2}ma^2\omega^2\cos^2\omega t$

$= \frac{1}{2}m\omega^2 a^2(1 + \cos 2\omega t)$ hence kinetic energy varies periodically with double the frequency of S.H.M. *i.e.* 2ω.

17. (A)

Sol. $\omega = \sqrt{\frac{\text{Acceleration}}{\text{Displacement}}} = \sqrt{\frac{2.0}{0.02}} = 10\,rad\,s^{-1}$

18. (B)

Sol. When a little mercury is drained off, the position of *c.g.* of ball falls (*w.r.t.* fixed and) so that effective length of pendulum increases hence T increase.

19. (D)

Sol. $T \propto \sqrt{l} \Rightarrow \frac{T_1}{T_2} = \sqrt{\frac{l_1}{l_2}} \Rightarrow \frac{2}{T_2} = \sqrt{\frac{l}{4l}}$

$\Rightarrow T_2 = 4\,sec$

20. (A)

Sol. No momentum will be transferred because, at extreme position the velocity of bob is zero.

21. (A)

Sol. When external force is applied, one spring gets extended and another one gets contracted by the same distance hence force due to two springs act in same direction.

i.e. $F = F_1 + F_2$

$\Rightarrow -kx = -k_1x - k_2x \Rightarrow k = k_1 + k_2$

22. (A)

Sol. $T = 2\pi\sqrt{\dfrac{m}{k}} \Rightarrow \dfrac{T_2}{T_1} = \sqrt{\dfrac{m_2}{m_1}} \Rightarrow \dfrac{3}{2} = \sqrt{\dfrac{m+2}{m}}$

$\Rightarrow \dfrac{9}{4} = \dfrac{m+2}{m}$

$\Rightarrow m = \dfrac{8}{5}kg = 1.6\ kg$

23. (D)

Sol. Potential energy of particle performing SHM is given by: $PE = \dfrac{1}{2}m\omega^2y^2$ *i.e.* it varies parabolically such that at mean position it becomes zero and maximum at extreme position.

24. (D)

Sol. Spring constant $\propto \dfrac{1}{\text{Length of spring}}$

$\Rightarrow k' = \dfrac{k}{n}$

Also, spring constant depends on material properties of the spring.

Hence assertion is false, but reason is true.

25. (A)

Sol. $v = \sqrt{\dfrac{\gamma P}{\rho}} \Rightarrow \dfrac{v_{O_2}}{v_{H_2}} = \sqrt{\dfrac{\rho_{H_2}}{\rho_{o_2}}} = \sqrt{\dfrac{1}{16}} = \dfrac{1}{4}$

26. (C)

Sol. $v = \sqrt{\dfrac{\gamma RT}{M}} \Rightarrow v \propto \sqrt{T}$

i.e. if v is doubled then T becomes four times, hence $T_2 = 4T_1 = 4(273+27) = 1200\,K = 927\,°C$

27. (C)

Sol. At given temperature and pressure

$v \propto \dfrac{1}{\sqrt{\rho}} \Rightarrow \dfrac{v_1}{v_2} = \sqrt{\dfrac{\rho_2}{\rho_1}} = \sqrt{\dfrac{4}{1}} = 2:1$

28. (C)

Sol. Path difference $\Delta = \dfrac{\lambda}{2\pi}\times\phi = \dfrac{\lambda}{2\pi}\times\dfrac{\pi}{3} = \dfrac{\lambda}{6}$

29. (C)

30. (B)

Sol. The distance between two points *i.e.* path difference between them

$\Delta = \dfrac{\lambda}{2\pi}\times\phi = \dfrac{\lambda}{2\pi}\times\dfrac{\pi}{3} = \dfrac{\lambda}{6} = \dfrac{v}{6n}\quad (\because v = n\lambda)$

$\Rightarrow \Delta = \dfrac{360}{6\times 500} = 0.12\,m = 12\,cm$

31. (B)

Sol. $v = \dfrac{\text{Co - efficient of } t}{\text{Co - efficient of } x} = \dfrac{100}{50} = 2\,m/\text{sec}$.

32. (A)

Sol. Both waves are moving opposite to each other

33. (A)

Sol. Phase difference is 2π means constrictive interference so resultant amplitude will be maximum.

34. (D)

35. (D)

Sol. For producing beats, their must be small difference in frequency.

36. (D)

Sol. $\dfrac{I_{max}}{I_{min}} = \left(\dfrac{a_1+a_2}{a_1-a_2}\right)^2 = \dfrac{(5+3)^2}{(5-3)^2} = \dfrac{16}{1}$

37. (B)

Sol. From the given equations of progressive waves $\omega_1 = 500\pi$ and $\omega_2 = 506\pi$ $\therefore$ $n_1 = 250$ and $n_2 = 253$

So beat frequency $= n_2 - n_1 = 253 - 250 = 3$ *beats per sec* $\therefore$ Number of beats per min = 180.

38. (C)

Sol. At nodes pressure change (strain) is maximum

39. (A)

Sol. Energy is not carried by stationary waves

40. (A)

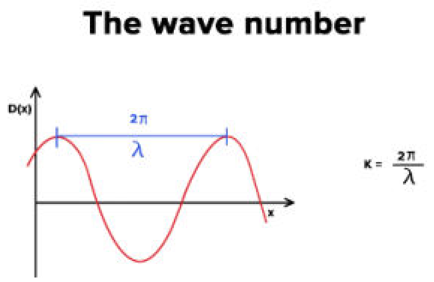
Sol. The velocity of sound in solid is given by, $v = \sqrt{E/\rho}$. Though ρ is large for solids, but their coefficient of elasticity E is much larger (compared to that of liquids and gases). That is why v is maximum in case of solid

41. (C)

Sol. Frequency - Number of waves passing through a point per unit time.
Wave length - Linear distance between starting and end point of 1 complete wave.
Wave number - No. of waves contained in unit length
Speed - Linear distance travelled by a wave per unit time.

42. (B)

Sol.



43. (D)

Sol. This is the special case of physical pendulum and in this case $T = 2\pi\sqrt{\frac{2l}{3g}}$

$\Rightarrow \ T = 2\times 3.14\sqrt{\frac{2\times 2}{3\times 9.8}} = 2.31 \text{ sec} \approx 2.4 \text{ sec}$

44. (A)

Sol. We know that speed of velocity in air $v \propto \sqrt{T}$ or $v^2 \propto T$ b

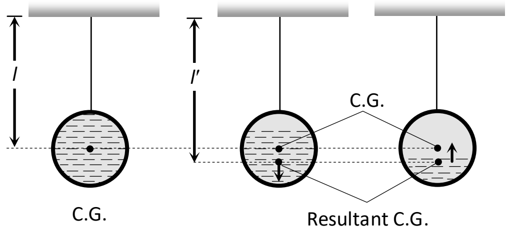
Thus, $\frac{v_1^2}{v_2^2} = \frac{T_1}{T_2}$

Or $\frac{v_1^2}{(2v_1)^2} = \frac{0+273_1}{T_2}$

Or $T_2 = 1092K = (1092-273)°C = 819°C$

45. (D)

Sol. The given system is like a simple pendulum, whose effective length (l) is equal to the distance between point of suspension and C.G. (Centre of Gravity) of the hanging body.
When water slowly flows out the sphere, the C.G. of the system is lowered, and hence l increases, which in turn increases time period (as $T \propto \sqrt{l}$).
After some time weight of water left in sphere become less than the weight of sphere itself, so the resultant C.G. gets clear the C.G. of sphere itself i.e. l decreases and hence T increases.
Finally when the sphere becomes empty, the resulting C.G. is the C.G. of sphere i.e. length becomes equal to the original length and hence the time period becomes equal to the same value as when it was full of water.



46. (D)

Sol. $y = f(x^2 - vt^2)$ doesn't follows the standard wave equation.

47. (D)

Sol. $y = \sin^2 \omega t = \frac{1-\cos 2\omega t}{2}$

$\Rightarrow$ Period, $T = \frac{2\pi}{2\omega} = \frac{\pi}{\omega}$

The given function is not satisfying the standard differential equation of S.H.M. $\frac{d^2y}{dx^2} = -\omega^2 y$. Hence it represents periodic motion but not S.H.M.

48. (A)

Sol. In the same phase $\phi = 0$ so resultant amplitude $= a_1 + a_2 = 2A + A = 3A$

49. (D)

Sol. n_A = Known frequency = 256, n_B = ?
x = 2 *bps*, which is decreasing after loading (*i.e.* $x\downarrow$) known tuning fork is loaded so $n_A\downarrow$
Hence $n_A\downarrow - n_B = x\downarrow$ ... (i) $\rightarrow$ Correct
$n_B - n_A\downarrow = x\downarrow$ ... (ii) $\rightarrow$ Wrong
$\Rightarrow n_B = n_A - x = 256 - 2 = 254\ Hz.$

50. (D)

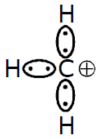
Sol. When the bob is immersed in water its effective weight = $\left(mg - \frac{m}{\rho}g\right) = mg\left(\frac{\rho-1}{\rho}\right)$

$\therefore g_{eff} = g\left(\frac{\rho-1}{\rho}\right)$ $\frac{T'}{T} = \sqrt{\frac{g}{g_{eff}}}$

$\Rightarrow T' = T\sqrt{\frac{\rho}{(\rho-1)}}$

51. (B)

Sol.



Carbocation has 3 pair of electrons.

52. (A)

Sol. Alkyne and diene are functional isomers

53. (D)

Sol. Alicyclic compounds are Aliphatic cyclic compounds.

54. (C)

Sol. $pK_b \propto \dfrac{1}{+\text{I effect}}$

55. (C)

Sol. Basicity in aqueous medium of $-NH_3$ aqueous follows the order:

$2° > 1° > 3°$

56. (C)

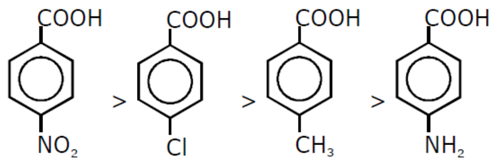
Sol. Stability (↑) π bond (↑)

57. (C)

Sol. $C^{\oplus}$ stability order [3° > 2° > 1°]

58. (C)

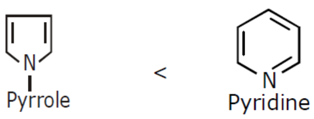
Sol.



(Acidic nature $\propto$ –M efect)

59. (A)

Sol.

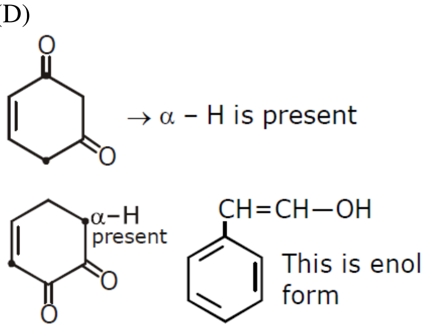


60. (D)

Sol. Because of allyilc position of Br. It forms stable allylic carbocation after removal of Br.

61. (D)

Sol.



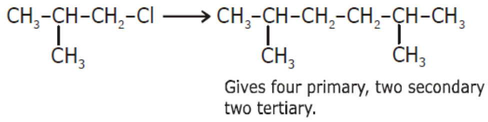
So all can exhibit tautomerism.

62. (B)

Sol. Kolbe's reaction is convenient for preparation of alkanes containing even number of carbon atoms not odd.

63. (D)

Sol. Isobutyl chloride give



64. (D)

Sol. When D or H atoms are with O, S, N then D atom or H-atom replaces MgBr in respective RMgX.

C_2H_5MgBr always gives C_2H_5D or C_2H_6.

65. (C)

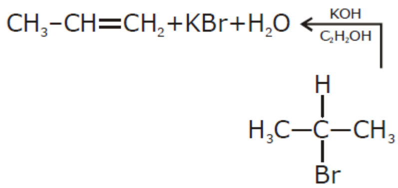
Sol. 3° carbon would be fastest because abstraction of hydrogen will be fast.

66. (A)

Sol. C_2H_4Cl + alc. KOH $\longrightarrow CH_2 = CH_2$

67. (D)

Sol.

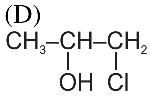


68. (C)

Sol. Lindlar's catalyst consist of $CaCO_3$, $(CH_3COO)_2Pb$, quinoline, and $BaSO_4$ etc. This is used for further reduction to stop.

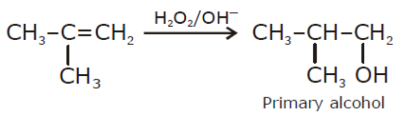
69. (D)

Sol.



70. (A)

Sol.

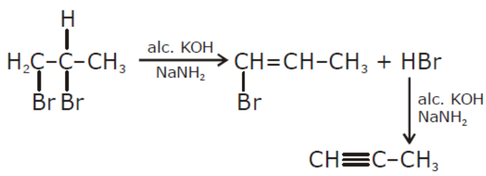


71. (C)

Sol. HCl does not form Anti Markovnikov's Product with propene, because formation of Cl is energetically unfavourable.

72. (B)

Sol.



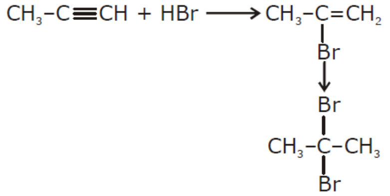
73. (A)

Sol. $CH \equiv CH + RI \xrightarrow{CH_3MgBr} R-C \equiv CH$

Alkylation can also be done using Grignard reagent.

74. (C)

Sol.

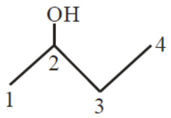


2,2-Dibromopropane

This reaction is electrophilic addition reaction.

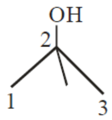
75. (C)

Sol.



s-Butyl alcohol

4-carbon chain

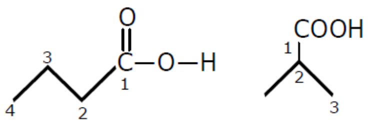


t-Butyl alcohol

3-carbon chain

76. (C)

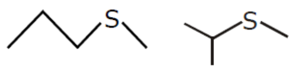
Sol.



They both are chain isomer

77. (B)

Sol.

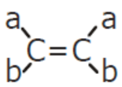


Methyl propyl Thioether

Isopropyl Methyl thioether

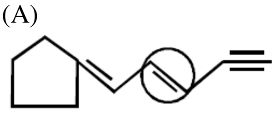
⇒ Position isomer

78. (A)

Sol. Geometrical isomerism exists due to restricted rotation and  type compound

79. (A)

Sol.



Total geometrical isomers = $2^1 = 2$

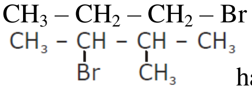
∴ cis-trans isomerism = 2

80. (D)

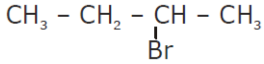
Sol. Methyl 2-Methyl hepta(2Z, 5E) dienoate.

81. (D)

Sol. $CH_3 - CH_2 - CH_2 - Br$ has no chiral centre.



has one chiral centre.



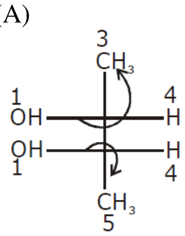
has one chiral centre so B & C options are correct.

82. (C)

Sol. If 2 atoms attached to double bond have same atomic number then the relative priority of groups is determined by similar comparision of atomic number of next elements. Thus preference order is $OCH_3 > OH > COOH > CHO$

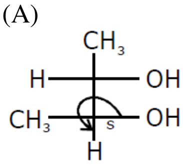
83. (A)

Sol.



84. (A)

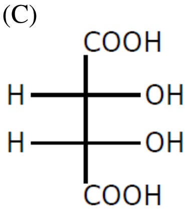
Sol.



(S) (horizontal lower priority)

85. (C)

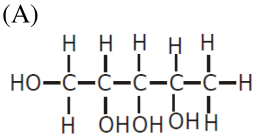
Sol.



Meso tartaric acid The fischer projection is unstable also due to internal compensation.

86. (A)

Sol.



87. (A)

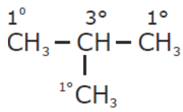
Sol. Conformers (eclipsed and staggered form)

88. (C)

Sol. Unsaturated compounds have double or triple bonds

89. (A)

Sol.



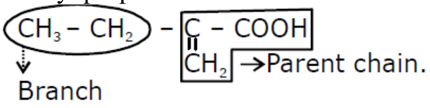
Total 1° hydrogen atoms are those which are attached to 1° carbon atom vice versa for 3°.

90. (D)

Sol. In homologous series general formula is same, all the members have similar chemical properties, adjacent members differ in molecular mass by 14 and Homologous series members have different physical properties due to difference in weight

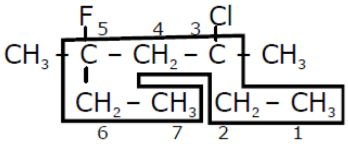
91. (B)

Sol. 2–ethyl prop – 2 – enoic acid



92. (C)

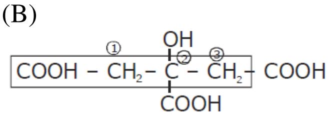
Sol.



3–Chloro–5–fluoro 3, 5 – dimethyl heptane.

93. (B)

Sol.



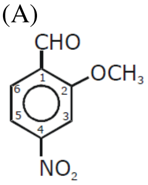
2–Hydroxy propane – 1,2,3. tricarboxylic acid.

94. (B)

Sol. $CH_3-O-\overset{O}{\overset{\|}{C}}-\overset{2}{C}H_2-\overset{1}{C}OOH$

95. (A)

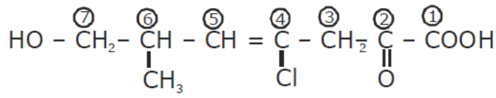
Sol.



2–methoxy–4–nitro benzene carbaldehyde

96. (B)

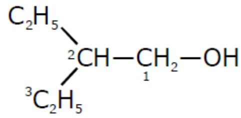
Sol.



$\Rightarrow$ COOH group is main functional group. Suffix = oic acid Prefixes for other - chloro , methyl, hydroxy,oxo Parent chain-hept-4-ene

97. (A)

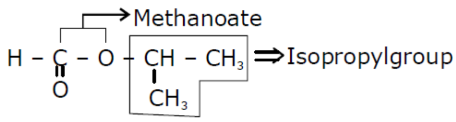
Sol.



2–Ethyl butan-1-ol

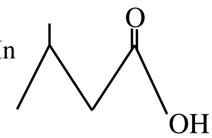
98. (D)

Sol.



Isopropyl methanoate

99. (C)

Sol. In  , the functional group is – COOH. The numbering is done from R.H.S. to give minimum number to carbon atom bearing the functional group

100. (C)

Sol. **Assertion : -** correct, Reason-false

all asymmetric molecules are optically active