25/02/2025

CODE-B

Aakash
Medical | IIT-JEE | Foundations

Corporate Office : AESL, 3rd Floor, Incuspaze Campus-2, Plot-13, Sector-18, Udyog Vihar, Gurugram, Haryana-122015

MOCK TEST for NEET-2025

MM : 720 | **Test - 5** | **Time : 3 Hrs.**

Answers

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

Aakash
Medical | IIT-JEE | Foundations

Corporate Office : AESL, 3rd Floor, Incuspaze Campus-2, Plot-13, Sector-18, Udyog Vihar, Gurugram, Haryana-122015

MOCK TEST for NEET-2025

MM : 720 **Test - 5** **Time : 3 Hrs.**

Answers & Solutions

PHYSICS

1. Answer (3)

Slope of position-time gives velocity. Magnitude of slope is first decreasing then increasing.

2. Answer (2)

$$H = \frac{1}{2}gt^2 \Rightarrow H = \frac{1}{2}\times 10\times 8^2 \Rightarrow H = 320\text{ m} \quad \ldots(i)$$

and $t = \frac{40}{10} = 4$ s

$$h' = \frac{1}{2}gt^2 \Rightarrow h' = \frac{1}{2}\times 10\times 4^2 \Rightarrow h' = 80\text{ m} \quad \ldots(ii)$$

Height from ground = $H - h'$ = 320 – 80 = 240 m

3. Answer (4)

Impulse $\Rightarrow \vec{I} = \Delta\vec{P} = \vec{P_f} - \vec{P_i}$

$$\vec{I} = m\left(\vec{v_f} - \vec{v_i}\right)$$

$$|\vec{I}| = 3\left(54\times\frac{5}{18} - 36\times\frac{5}{18}\right)$$

$$|\vec{I}| = 3\times 5\times(3-2) = 15\text{ kg m s}^{-1}$$

4. Answer (2)

From Pascal's law $\Rightarrow P_1 = P_2$

$$\frac{F_1}{A_1} = \frac{F_2}{A_2} \Rightarrow \frac{10^6\times 10^{-5}\text{ N}}{150\text{ cm}^2} = \frac{F_2}{15\times 10^5\text{ cm}^2}$$

$F_2 = 10^5$ N

5. Answer (3)

We know, $U = nC_vT$

$$= \frac{5}{2}nRT = \frac{5}{2}(PV)$$

6. Answer (3)

Net electric flux is the measure of field lines originating/terminating from a charge.

$$\therefore \quad \frac{N}{N'} = \frac{+3Q}{|-Q|} \Rightarrow N' = \frac{N}{3}$$

And $N'' = N - \frac{N}{3} = \frac{2N}{3}$

7. Answer (3)

de-Broglie wavelength is given by

$$\lambda = \frac{h}{p}$$

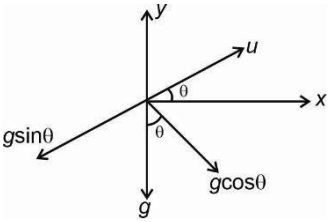
$\therefore$ If λ is same then p is same.

Also, $\text{KE} = \frac{p^2}{2m} \Rightarrow \text{KE} \propto \frac{1}{m}$

8. Answer (1)

$$\left[\frac{A}{B}\right] = [Et] = [\text{ML}^2\text{T}^{-1}]$$

9. Answer (1)



When velocity is perpendicular to initial velocity then

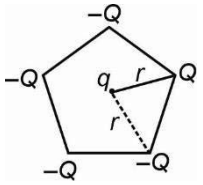
$u - g\sin\theta\, t = 0$

$$t = \frac{u}{g\sin\theta} = \frac{150\times 2}{10\times\sqrt{3}} = \frac{30}{\sqrt{3}} = 10\sqrt{3}\text{ s}$$

10. Answer (4)

Young's modulus depends upon material of wire of a wire.

11. Answer (1)



Let assume the charge (Q) is $Q + Q - Q$. Due to the $-Q$ charge at all corners net force is zero. So remaining $+2Q$ will give force $\frac{2kQq}{r^2}$.

12. Answer (4)

$V_P - IR + E - \frac{LdI}{dt} = V_Q$

$V_Q - V_P = -15 + 15 - 7 \times 10^{-3} \times 10^3 \times 2$

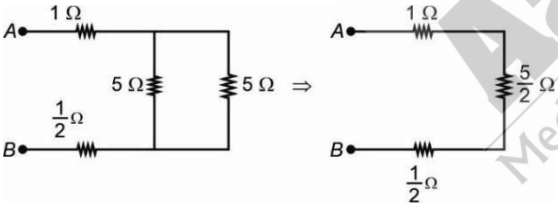
$= -14$ V

13. Answer (3)

Electric potential inside a conducting shell is $\frac{kQ}{R}$.

And electric potential outside it is given by $E = \frac{kQ}{r}$ for $r \geq R$

14. Answer (3)



$R_{eq} = 1 + \frac{5}{2} + \frac{1}{2} = 1 + \frac{6}{2} = 4\ \Omega$

15. Answer (4)

Current sensitivity $\Rightarrow \frac{\theta}{i} = \frac{NBA}{C}$

16. Answer (3)

Kinetic energy per molecule per degree of freedom is $\frac{1}{2}k_BT$

The rotational degree of freedom for diatomic gas is equal to 2

$\therefore \quad KE = \frac{2}{2}k_BT = k_BT$

16. Answer (3)

Wave number = $\frac{1}{\lambda}$

18. Answer (1)

The magnetic force $q(\vec{v} \times \vec{B})$ will move positive charge towards end B.

19. Answer (4)

Net electric flux associated with the cube placed in a uniform electric field is zero.

$\phi_{net} = \frac{q_{inside}}{\varepsilon_0}$

$\Rightarrow q_{inside} = 0$

20. Answer (4)

Average power = $V_{rms}\, I_{rms} \cos\phi$

$= \frac{200}{\sqrt{2}} \times \frac{10}{\sqrt{2}} \times \cos\left(\frac{\pi}{3}\right)$

$= 1000 \times \frac{1}{2} = 500$ W

21. Answer (3)

Magnetic induction due to portion CD at 0 is zero

22. Answer (3)

PV^γ = constant

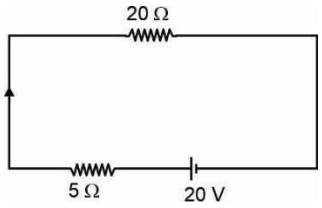
& for an ideal gas, $PV = nRT$

$P = \frac{nRT}{V} \Rightarrow \frac{nRT}{V}V^\gamma$ = constant

$TV^{\gamma-1}$ = constant

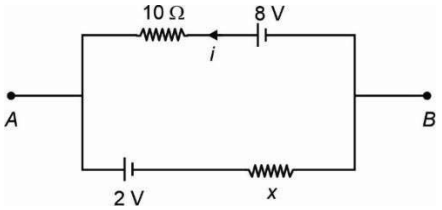
23. Answer (4)

Diode D_1 is in forward bias and D_2 is in reverse bias. So equivalent circuit is



$I = \frac{20}{25} = \frac{4}{5} = 0.8$ A

24. Answer (4)



$\Rightarrow V_A + 10i - 4 = V_B$

$\Rightarrow V_A - V_B - 4 = 10i$

$\Rightarrow 6 - 4 = 10i \Rightarrow i = \frac{2}{10} = \frac{1}{5}$A

Now $V_A - 2 - xi = V_B$

$V_A - V_B - 2 = xi \Rightarrow 4 = \frac{x}{5} \Rightarrow x = 20\ \Omega$

25. Answer (2)

Range of ammeter $I = I_g\left(1 + \frac{G}{s}\right)$

$\Rightarrow I = 3I_g$ (given)

$3I_g = I_g\left(1 + \frac{R}{s}\right)$

$\Rightarrow 3 = 1 + \frac{R}{s} \Rightarrow \frac{R}{s} = 2$

$s = \frac{R}{2}$

26. Answer (3)

By Newton's Law of cooling

$\frac{T_1 - T_2}{t} = k\left[\frac{T_1 + T_2}{2} - T_s\right]$

$\Rightarrow \frac{10}{10} = k[65] \Rightarrow k = \frac{1}{65}$

and

$\frac{10}{t} = k[55] \Rightarrow \frac{10}{t} = \frac{1}{65} \times 55$

$t = \frac{65 \times 10}{55}$ = 11.8 minutes

27. Answer (3)

0°C ice to 0°C water

$\Rightarrow Q_1 = ml_f = 10 \times 80 = 800$ cal

0°C water into 80°C water

$\Rightarrow Q_2 = ms\Delta T = 10 \times 1 \times 80 = 800$ cal

$Q_{required} = 1600$ cal

28. Answer (1)

$\lambda_m = \frac{\lambda_{air}}{\mu}$

$\mu = \frac{\lambda_{air}}{\lambda_m} = \frac{5000}{2500} = 2$

By snell's law

$\mu \sin i_c = 1.\ \sin 90°$

$\sin i_c = \frac{1}{\mu}$

$i_c = \sin^{-1}\left(\frac{1}{2}\right) = 30°$

29. Answer (4)

$P = 10$D

$\Rightarrow \frac{1}{f} = \frac{10}{100}$

$\Rightarrow f = 10$ cm

When image formed at infinity

Magnifying power $= \frac{D}{f} = \frac{25}{10} = 2.5$

30. Answer (2)

When light is incident at polarising angle, then reflected and refracted rays are perpendicular to each other.

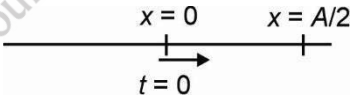
$\therefore \mu = \tan\theta p$

$= \tan 53° = \frac{4}{3}$

31. Answer (4)

$a = \frac{100 - 100 \times \sin 37°}{20} = \frac{100 - 60}{20} = \frac{40}{20} = 2$ m/s^2

32. Answer (4)



$\Rightarrow x = A\sin(\omega t)$

$\Rightarrow \frac{A}{2} = A\sin(\omega t)$

$\Rightarrow \frac{\pi}{6} = \frac{2\pi}{T}t \Rightarrow t = \frac{T}{12}$

33. Answer (3)

Moment of inertia about

Given axis = $\frac{MR^2}{2}$

$\Rightarrow Mk^2 = \frac{MR^2}{2} \Rightarrow k = \frac{R}{\sqrt{2}}$

$= 5 \times 0.707 = 3.54$ cm

34. Answer (3)

$\vec{R}_{com} = \frac{m_1\vec{r}_1 + m_2\vec{r}_2 + m_3\vec{r}_3}{m_1 + m_2 + m_3}$

$= \frac{m(1,2) + m(2,3) + m(3,4)}{3m} = \left(\frac{6}{3}, \frac{9}{3}\right)$

$= (2, 3)$

35. Answer (3)

Time varying magnetic field produces electric field (Faradays experiment) & time varying electric field produces magnetic field. (Maxwells experiment)

36. Answer (1)

Here magnetic field due to long straight wire is zero on *z*-axis.

37. Answer (1)

$V_{net} = \sqrt{V_R^2 + V_L^2}$

$10^2 = 5^2 + V_L^2 \Rightarrow V_L^2 = 100 - 25 = 75$

$V_L = 5\sqrt{3}$ V

$I = \frac{5\sqrt{3}}{5\sqrt{3}} A = 1$ A

38. Answer (2)

For minimum deviation condition

$r = \frac{A}{2} = 30°$

$\mu = \frac{\sin i}{\sin r} = \frac{\sin 45°}{\sin 30°} = \sqrt{2}$

39. Answer (3)

According to de-Broglie wavelength $\lambda = \frac{h}{p}$ for all particles.

40. Answer (1)

$V_{max} = A\omega$ & $a_{max} = A\omega^2$

$\frac{a_{max}}{v_{max}} = \frac{A\omega^2}{A\omega} = \omega$

$\Rightarrow \frac{\pi}{2} = \omega = 2\pi f$

$f = \frac{1}{4}$ Hz

41. Answer (1)

$\vec{F} = q(\vec{V} \times \vec{B})$

Here magnetic field due to wire at point *P* is into the plane of the paper.

Therefore direction of force is opposite to *OX*

42. Answer (3)

$A + B \longrightarrow C$

For stable reaction

$(B.E.)_P > (B.E.)_R$

$\Rightarrow E_c > E_a + E_b$

43. Answer (2)

$y = \bar{A} + \bar{B} = \overline{A \cdot B}$

NAND gate

44. Answer (1)

Transition *I* has highest energy of emission. So it has least wavelength

45. Answer (2)

$g' = \frac{GM}{\left(\frac{R}{4} + R\right)^2} = \frac{16}{25}\frac{GM}{R^2} = \frac{16}{25} \times 10$

$= \frac{32}{5} = 6.4$ m s^{-2}

$W' = 640$ N

CHEMISTRY

46. Answer (1)

(Quantum number)	(Orbital)
n = 3, l = 2	3*d*
n = 3, l = 1	3*p*
n = 2, l = 1	2*p*
n = 4, l = 3	4*f*

47. Answer (3)

Oxide	Nature
Cl_2O_7	Acidic
Al_2O_3	Amphoteric
Na_2O	Basic
N_2O	Neutral

48. Answer (4)

For first order reaction

$$t_{1/2} = \frac{0.693}{k} \Rightarrow k = \frac{0.693}{t_{1/2}}$$

$$k.t = 2.303 \log \frac{[A]_0}{[A]_t}$$

$$\frac{0.693}{t_{1/2}} \times (3.32) = 2.303 \log \frac{100}{70}$$

$t_{1/2}$ = 6.45 second

49. Answer (4)

They are chemically inert

50. Answer (2)

$CaCO_3(s) \rightarrow CaO(s) + CO_2(g)$

$\Delta_r H°_{reaction} = (\Delta_f H°)_{products} - (\Delta_f H°)_{reactant}$

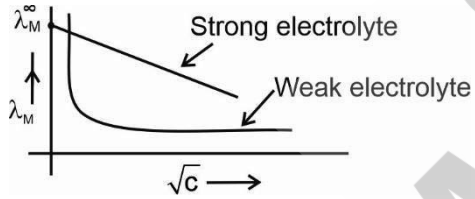
= (–650 –500) – (–1300)

= –1150 + 1300

= +150 kJ/mol

51. Answer (4)

According to Ostwald's law of dilution, the degree of dissociation increases with the dilution of weak electrolytes. Thus,



52. Answer (2)

For isoelectronic species, the ionic size decreases with increase in nuclear charge.

∴ Order of ionic size is

$Ca^{2+} < K^+ < Cl^- < S^{2-}$

53. Answer (4)

$$r_n = \frac{52.9(n^2)}{z} \text{ pm}$$

$$\frac{r_{He^+}}{r_{Li^{2+}}} = \frac{\frac{(3)^2}{2}}{\frac{(3)^2}{3}}$$

$$\frac{238.05}{r_{Li^{2+}}} = \frac{9}{2} \times \frac{3}{9}$$

$$\frac{238.05}{r_{Li^{2+}}} = \frac{3}{2}$$

$$r_{Li^{2+}} = \frac{238.05 \times 2}{3} = 158.7 \text{ pm}$$

54. Answer (1)

(Molecules)	(Shape)
BrF_5	Square pyramidal
PF_5	Trigonal bipyramidal
SF_4	See-saw
XeF_4	Square planar

55. Answer (3)

Bond orders	Species
2.5	O_2^+
2	O_2
1	O_2^{2-}

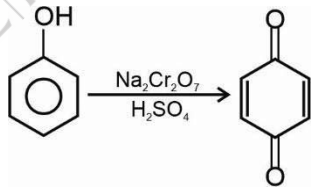
56. Answer (1)

Extensive property depends upon the quantity or size of matter present in the system.

57. Answer (1)

- Due to presence of $–NO_2$ group at para position, phenoxide ion gets stabilised.

  So, p-nitrophenol is more acidic than phenol.

- 

- In Kolbe's reaction phenol forms salicylic acid.

58. Answer (3)

Group V basic radicals precipitate as carbonates.

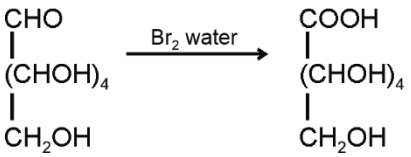
59. Answer (4)

F_2 does not show disproportionation reaction since fluorine does not show any positive oxidation state.

60. Answer (4)

$IF_7 + 4H_2O \rightarrow 7HF + HIO_4$.

61. Answer (1)



Gluconic acid

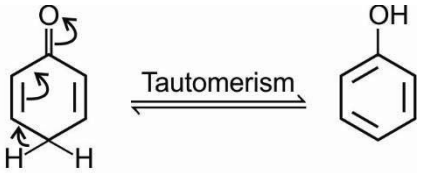
62. Answer (3)

Benzaldehyde gives positive Tollens test but does not give Fehling's test.

63. Answer (2)

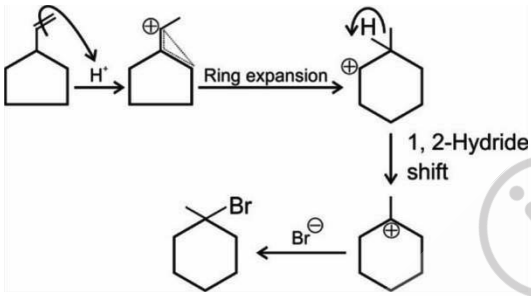
$-NO_2$ has – M effect, it decreases the stability of the carbocation.

64. Answer (3)



- enolisable H is present

65. Answer (4)



66. Answer (1)

$$4FeCl_3 + 3\underset{\text{Potassium ferrocyanide}}{K_4[Fe(CN)_6]} \rightarrow \underset{\text{Prussian blue precipitate}}{Fe_4[Fe(CN)_6]_3} + 12KCl$$

67. Answer (3)

188 g AgBr contains 80 g of bromine

0.2 g of AgBr contains $\frac{80 \times 0.2}{188}$ g of bromine

Percentage of bromine = $\frac{80 \times 0.2 \times 100}{188 \times 0.28} = 30.4\%$

68. Answer (2)

$\because \quad \pi_{1(urea)} = \pi_{2(unknown)}$

$\therefore \quad C_1 = C_2$

$\frac{W_1}{M_1} = \frac{W_2}{M_2}$

$\frac{5}{60} = \frac{2}{M_2}$

$M_2 = \frac{60 \times 2}{5} = 24$ g/mol

69. Answer (3)

1 molal aq. solution means 1 mol of solute is dissolved in 1000 g of H_2O.

Number of moles of $H_2O = \frac{1000}{18} = 55.55$ mol

$\chi_{solvent} = \frac{55.55}{55.55+1} = 0.9823$

70. Answer (3)

(i) The process of cleavage of the C–X bond by ammonia molecule is known as ammonolysis.

(ii) The reaction of phthalimide with KOH and R–X gives 1° amines as $R-NH_2$.

(iii) $R-\underset{\underset{O}{\|}}{C}-NH_2 + Br_2 + 4NaOH \longrightarrow R-NH_2 + Na_2CO_3 + 2NaBr + 2H_2O$

(iv) $Ph-NH_2 + CHCl_3 + 3KOH \xrightarrow{Heat} \underset{\text{Isocyanide}}{Ph-N\equiv C} + 3KCl + 3H_2O$

71. Answer (1)

Constituents of bronze : Cu + Sn

72. Answer (4)

Down the group, bond enthalpy for the dissociation of H – E bond decreases as a result, the acidic character increases.

73. Answer (4)

Entropy for a spontaneous process increases till it reaches maximum and the change in entropy, $\Delta S = 0$.

74. Answer (1)

$10I^- + 2MnO_4^- + 16H^+ \longrightarrow 2Mn^{2+} + 8H_2O + 5I_2$

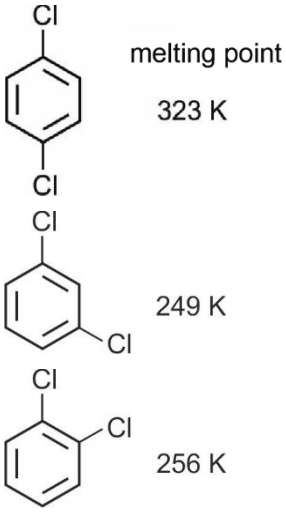
For 10 moles of I^-, 2 moles of MnO_4^- is required.

For 2 mol of I^-, $\frac{2}{5}$ moles of MnO_4^- is required.

75. Answer (2)

$K_4[Fe(CN)_6] \longrightarrow \underbrace{4K^+ + [Fe(CN)_6]^{4-}}_{5 \text{ ions}}$

76. Answer (4)

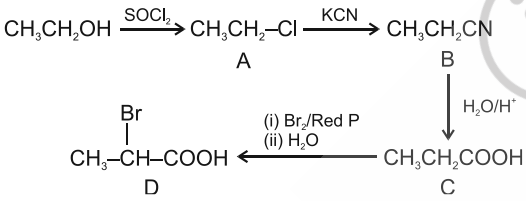


Para – isomer has high melting point than o and m isomer because of symmetry.

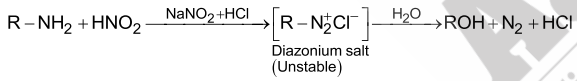
77. Answer (2)

The bond length of terminal B–H bond is less than the bond length of bridge B–H bond.

78. Answer (2)



79. Answer (2)

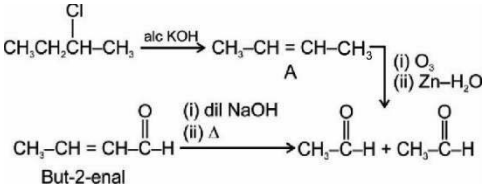


80. Answer (1)

Order of acidic character is

$HCOOH > C_6H_5COOH > C_6H_5CH_2COOH > CH_3COOH$

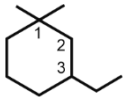
81. Answer (2)



82. Answer (2)

1. Propene with $HBr/(C_6H_5CO)_2O_2$ = Free radical addition reaction.
2. Methane with $Br_2/h\nu$ = Free radical substitution reaction.
3. Propyne with $HgSO_4$ and dil. H_2SO_4 at 333 K = Electrophilic addition reaction.
4. Benzene + $CH_3Cl \xrightarrow{\text{anhyd. } AlCl_3}$ electrophilic substitution reaction.

83. Answer (4)



3-Ethyl-1, 1-dimethylcyclohexane

84. Answer (3)

More stable the carbocation is, more will be the reactivity of the alkyl halide towards S_N1 reaction.

85. Answer (4)

In case of negative deviations from Rault's law, the intermolecular attractive forces between A-A and B-B are weaker than those between A-B and leads to decrease in vapour pressure resulting in negative deviation.

86. Answer (2)

A 38% solution of sulphuric acid is used as an electrolyte in lead storage battery.

87. Answer (2)

Any acid stronger than carbonic acid gives effervescence of CO_2 with $NaHCO_3$.

88. Answer (4)

As the forward reaction is exothermic and leads to lowering of number of gaseous molecule. Therefore, according to Le Chatelier's principle, upon increasing pressure and decreasing temperature, reaction proceeds forward.

89. Answer (3)

$2Mg(s) + O_2(g) \rightarrow 2MgO(s)$

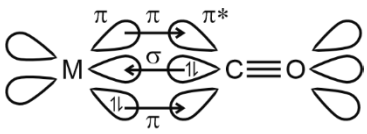
32 g oxygen reacts with 48 g magnesium

$0.32 \text{ g } O_2 \rightarrow \frac{48}{32} \times 0.32$

= 0.48 g magnesium

O_2 = limiting reactant

90. Answer (1)



Synergic bonding.

BOTANY

91. Answer (2)

Ecosystems are not exempt from the second law of thermodynamics as they need a constant supply of energy to synthesise the molecules, they require, to counteract the universal tendency towards increasing disorderliness.

92. Answer (1)

Placentation	**–**	**Plants**
Axile	–	Okra
Basal	–	Wheat
Parietal	–	Cabbage
Free central	–	*Primrose*

93. Answer (3)

China rose belongs to Malvaceae family and exhibits valvate aestivation in calyx

94. Answer (3)

Dicot roots show secondary growth, while monocot roots do not show secondary growth due to presence of closed vascular bundles.

95. Answer (2)

ER divides the intracellular space into two distinct compartments, *i.e.*, luminal (inside ER) and extra luminal (cytoplasm) compartments.

96. Answer (2)

The beginning of diplotene is recognised by the dissolution of the synaptonemal complex except at the site of crossovers *i.e.*, chiasmata. Disappearance of nucleolus is observed during diakinesis. Crossing over takes place during pachytene. Formation of tetrad occurs during zygotene.

97. Answer (3)

Xanthophyll imparts yellow colour in the chromatogram.

98. Answer (4)

Cytochrome c is a small protein attached to the outer surface of the inner membrane.

99. Answer (4)

A sigmoid curve is a characteristic of living organism growing in a natural environment.

100. Answer (4)

Sickle cell anaemia is a qualitative disorder but β-thalassemia is a quantitative disorder.

101. Answer (3)

In a bacterial cell, the process of translation can begin much before the mRNA is fully transcribed because mRNA processing is not required and nuclear membrane is absent in prokaryotic cell. Hence, transcription and translation is coupled in bacteria.

102. Answer (4)

In over 60% of angiosperms, pollens are shed at two-celled stage.

103. Answer (4)

Interphase has 3 stages G_1, S and G_2

- In G_1 phase synthesis of nucleotides, ATPs, amino acids and RNAs occurs.
- In S phase cell doubles its DNA amount.
- In G_2 phase duplication of mitochondria and chloroplast occurs.

104. Answer (4)

Centriole shows cartwheel appearance, with 9+0 arrangement of peripheral fibrils of tubulin protein.

105. Answer (2)

In monocot leaf, both layers of epidermis are cuticularized. Mesophyll is not differentiated into the palisade and spongy parenchyma. The vascular bundles are conjoint and closed. In grasses, some cells in the upper epidermis become large. These adaxial epidermal cells along the veins modify themselves into large, empty and colourless cells. These are called bulliform cells.

106. Answer (3)

Sequoia is the tallest gymnosperm.

107. Answer (4)

Kingdom plantae includes multicellular, photosynthetic, eukaryotic organisms.

108. Answer (4)

Viroids are free RNA particles. Viruses have capsid but viroids do not have it.

109. Answer (4)

Bryophytes lack well developed vascular tissues.

110. Answer (3)

Gulmohur and Bean have zygomorphic flowers.

111. Answer (1)

Red and green colour blindness occurs in about 8% of males and only about 0.4% of females. This is because the genes that lead to red-green colour blindness are on the X-chromosome.

112. Answer (3)

Honey bees exhibit haplodiploid sex-determination system which has special characteristic features such as the males produce sperms by mitosis, they do not have father and thus cannot have sons, but have a grand father and can have grandsons.

113. Answer (1)

In seagrasses, female flowers remain submerged in water and the pollen grains are released inside the water.

114. Answer (3)

Allelic sequence variation has traditionally been described as a DNA polymorphism if more than one variant (allele) at a locus occurs in human population with a frequency greater than 0.01.

115. Answer (2)

Repetitive sequences have no direct coding functions, but they shed light on chromosome structure, dynamics and evolution.

116. Answer (4)

The repressor gene of the *lac* operon is synthesised (all-the-time-constitutively) from the *i* gene.

117. Answer (4)

Statins produced by the yeast *Monascus purpureus* have been commercialised as blood-cholesterol lowering agents. It acts competitively by inhibiting the enzyme responsible for synthesis of cholesterol.

118. Answer (1)

Thermoregulation is energetically expensive for many organisms. Small animals are rarely found in polar regions.

119. Answer (2)

Biodiversity hotspots are the regions characterised by high levels of species richness and high degree of endemism.

120. Answer (4)

As we go higher from species to kingdom the number of common characteristics goes on decreasing. Lower the taxa, more are the characteristics that the members within the taxon share.

121. Answer (1)

Protein rich layer named pellicle is present in euglenoids.

122. Answer (2)

Spirogyra shows haplontic life cycle.

123. Answer (2)

Stilt roots arise from the lower nodes of stem as in maize and sugarcane.

124. Answer (4)

Cytoskeleton in a cell is involved in many functions such as mechanical support, motility, maintenance of the shape of the cell. Photophosphorylation occurs in chloroplast.

125. Answer (2)

Ribosome is membraneless organelle. Chloroplast and mitochondria are double membranous organelles.

126. Answer (4)

Mitotic apparatus (two asters together with spindle fibres) is formed during prophase.

127. Answer (1)

In some organisms karyokinesis is not followed by cytokinesis as a result of which multinucleate condition arises leading to the formation of syncytium.

128. Answer (2)

Temperature is the external factor that affects the rate of photosynthesis

129. Answer (3)

RQ value of two molecules of $C_{51}H_{98}O_6$ *i.e.* tripalmitin is (0.7).

130. Answer (3)

Seed dormancy can be removed by the application of gibberellic acid and nitrates.

131. Answer (2)

Phenylketonuria is an autosomal recessive disorder.

132. Answer (1)

In ABO Blood Group

	Genotypes			Phenotypes
①	I^AI^A	}	①	→ 'A' Blood Group
②	I^Ai			
③	I^AI^B		②	→ 'AB' Blood Group
④	I^BI^B	}	③	→ 'B' Blood Group
⑤	I^Bi			
⑥	ii		④	→ 'O' Blood Group

133. Answer (4)

RNA polymerase facilitates opening of DNA helix during transcription.

134. Answer (1)

Histones are basic proteins as they are rich in basic aminoacids lysine & arginine.

135. Answer (1)

Primary sewage treatment is a physical process which involves filtration and sedimentation.

ZOOLOGY

136. Answer (3)

Compound epithelium is made of more than one layer of cells and thus has a limited role in secretion and absorption.

They cover dry surface of the skin and the moist surface of buccal cavity.

137. Answer (3)

When action potential is conducted to ventricular side by the AVN, the ventricular muscles contract (ventricular systole) and simultaneously atria undergo relaxation (atrial diastole) coinciding with the ventricular systole.

138. Answer (4)

All changes that occurred are the result of the activation of fight and flight response due to sympathetic stimulation. Sympathetic stimulation increases the cardiac output.

139. Answer (3)

Role of O_2 in the regulation of respiratory rhythm is quite insignificant.

Changes in CO_2 and H^+ concentration are mainly recognised for regulation of respiration.

140. Answer (4)

Selection of recombinants using pBR322 is a cumbersome procedure as it requires simultaneous plating on two plates having different antibiotics.

141. Answer (3)

Normal activities of the human heart are regulated intrinsically, *i.e.*, autoregulated by specialised muscles present in heart (nodal tissues), hence it is called myogenic.

142. Answer (2)

Sternum, coccyx, atlas and axis are the bones of axial skeleton.

The bones of the limbs along with their girdles constitute the appendicular skeleton.

143. Answer (4)

Bt toxin gene has been introduced in plants in order to provide resistance against lepidopterans, dipterans and coleopterans.

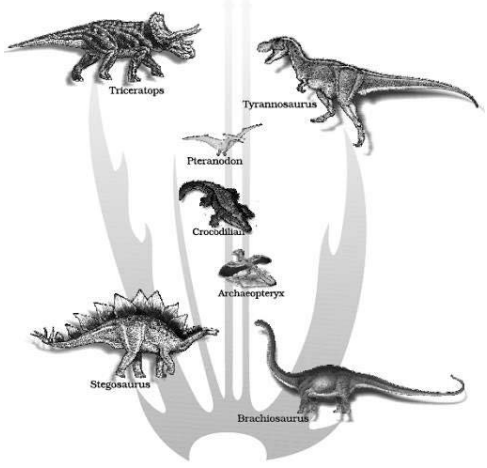
144. Answer (1)

Muscle fibre is the anatomical unit of muscle. Each muscle fibre has many parallelly arranged myofibrils. Each myofibril contains many serially arranged units called sarcomere which are the functional units.

145. Answer (3)

Tertiary structure of proteins is stabilised by peptide bonds, hydrogen bonds, ionic bonds, covalent bonds, hydrophobic bonds and Van der Waals interactions.

146. Answer (2)



147. Answer (4)

Anopheles, *Aedes*, *Apis* – Arthropoda

Sycon, *Spongilla* – Porifera

Canis – Chordata

148. Answer (1)

Reptiles, birds and land snails are uricotelic in nature. Mammals are ureotelic animals.

149. Answer (3)

Bone marked as 'X' is the sphenoid bone which forms the base of the cranium. It is not a facial bone.

150. Answer (4)

Both proximal convoluted tubule (PCT) and distal convoluted tubule (DCT) are present in renal cortex, outside the medullary pyramids.

151. Answer (2)

Ball and socket joint – Between humerus and pectoral girdle

Hinge joint – Between femur and tibia

Saddle joint – Between carpal and metacarpal of thumb

152. Answer (2)

Depolarisation occurs due to the opening of voltage gated Na^+ channels whereas repolarisation occurs due to opening of voltage gated K^+ channels and closure of voltage gated Na^+ channels.

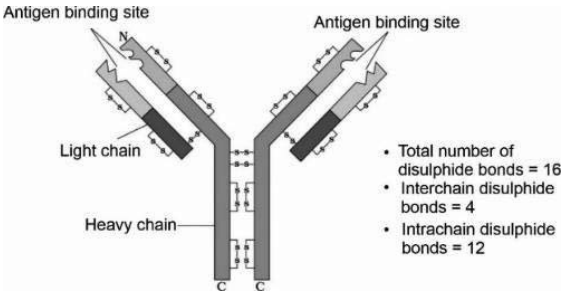
153. Answer (4)

GIFT involves *in vivo* fertilisation which means fertilisation takes place inside the female body.

154. Answer (4)

Aves are homeothermous, they have oil gland at the base of their tail, their hindlimbs have scales and are modified for walking, swimming whereas forelimbs are modified into wings. Endoskeleton is fully ossified (bony) and the long bones are hollow with air cavities (pneumatic).

155. Answer (2)



156. Answer (2)

Quaternary structure of proteins involves presence of more than one subunit of polypeptide chain as seen in insulin and in haemoglobin.

157. Answer (4)

'X' represents activation energy without an enzyme whereas 'Y' represents activation energy in presence of an enzyme. 'Z' represents transition state. If energy of product is at the lower level than substrate, the reaction is an exothermic reaction as one need not to supply energy (In the form of heat) in order to form the product.

158. Answer (2)

Reproductive system of male frog consists of a pair of yellowish ovoid testes. Vasa efferentia are 10-12 in number that arise from testes. They enter the kidney on their side and open into Bidder's canal. Finally, it communicates with the urinogenital duct that comes out of the kidneys and opens into the cloaca.

159. Answer (2)

Frogs respire on land and in water by two different methods. In water, skin acts as aquatic respiratory organ and on land the buccal cavity, skin and lungs act as the respiratory organs.

160. Answer (4)

Lane Q represents 'B' DNA fragments, R represents 'A' DNA fragments, and S represents 'C' DNA fragments.

161. Answer (4)

In cytokine barriers of innate immunity, interferons are included which protect non-infected cells from viral infections.

Also, cancerous patients are given α-interferons which activate their immune system and help in destroying the tumor.

162. Answer (1)

When foreign DNA (containing gene of interest) and vector DNA both are cut by the same restriction enzyme, the resultant DNA fragments have the same kind of 'sticky-ends' and these can be joined together (end-to-end) using DNA ligases.

163. Answer (2)

In order to transform a bacterial cell, means to take an alien piece of DNA, the cells must first be made competent. This is done by treating them with a specific concentration of a divalent cation, such as calcium which increases the efficiency with which DNA enters the bacterial cells through pores in its cell wall.

164. Answer (3)

Vaccines containing attenuated pathogens or antigenic preparations provide artificial active immunity. As given from outside, it allows body to fight against the weakened pathogens, so that memory against the pathogen can be induced by immune system and later used when actual pathogen infects.

165. Answer (4)

Sterilisation procedure in the female is called tubectomy, where a small part of fallopian tube is removed or tied up through a small incision in the abdomen or through vagina. These techniques are highly effective but their reversibility is very poor. It blocks gamete transport and thereby prevents conception. Females who undergo tubectomy do menstruate.

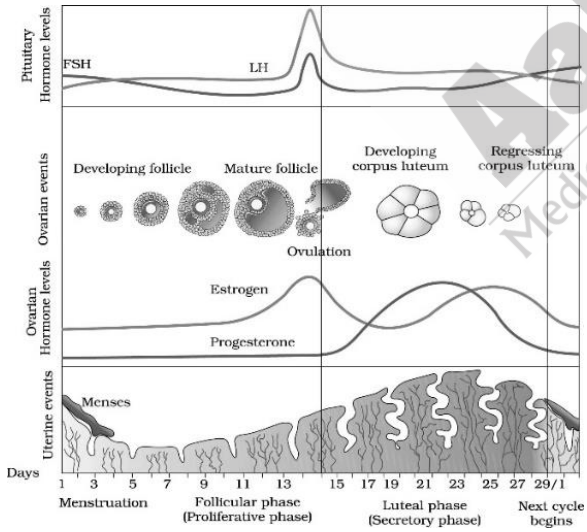
166. Answer (1)

Human sperm is a haploid cell, contain either 22 + X or 22 + Y chromosomes.

Primary spermatocyte is a diploid cell whereas secondary oocyte is a haploid cell.

Spermatids are non-motile as they do not have flagella.

167. Answer (2)



168. Answer (1)

The skull of baby chimpanzee is more like adult human skull than adult chimpanzee skull.

169. Answer (2)

DCT is not permeable to urea. Collecting duct allows passage of small amounts of urea into the medullary interstitium to keep up the osmolarity.

170. Answer (2)

The descending limb of loop of Henle is permeable to water but almost impermeable to electrolytes. This concentrates the filtrate as it moves downward whereas ascending limb of loop of Henle is impermeable to water but allows transport of electrolytes actively or passively which dilutes the filtrate as it moves upward.

171. Answer (2)

AV node is known as the pace setter. It maintains the rhythm of the impulse conduction and thereby delay impulses by 0.1 second. It allows both the atria to empty completely.

172. Answer (2)

The cerebrum wraps around a structure called thalamus, which is a major coordinating centre for sensory and motor signalling.

173. Answer (3)

Diaphragm and external inter-costal muscles contract during inspiration and increase the volume of thoracic cavity thereby lowering the intra-pulmonary pressure than the atmospheric pressure.

174. Answer (2)

Fetal haemoglobin has higher affinity towards oxygen and shifts the curve in left from normal oxygen-dissociation curve. In the alveoli too, where there is high pO_2, low pCO_2, lesser H^+ concentration and lower temperature, the factors are all favourable for the formation of oxyhaemoglobin and curve is shifted towards left.

175. Answer (4)

The systemic circulation starts with the pumping of oxygenated blood by the left ventricle to the aorta which is carried to all the body tissues and the deoxygenated blood from there is collected by veins and returned to right atrium.

176. Answer (2)

All the mentioned features belong to organisms present in the phylum Echinodermata.

Sycon is a porifer, *Pila* is a mollusc.

Pleurobrachia is a ctenophore whereas *Antedon* is an echinoderm.

177. Answer (4)

During fertilization, a sperm comes in contact with the zona pellucida layer of the ovum and induces changes in the membrane that blocks the entry of additional sperms.

Zona pellucida disintegrates just before implantation.

178. Answer (3)

Urochordates and cephalochordates are acraniates which are primitive but referred to as invertebrate chordates or protochordates.

Cyclostomes are the most primitive of all craniates.

179. Answer (1)

Seminal vesicles store the sperms and glue them together to form spermatophore. A pair of spermatheca is present in the 6^{th} abdominal segment in female cockroaches.

180. Answer (3)

The genetic code is nearly universal, for example, from bacteria to human UUU would code for phenylalanine.

Hence, genetic codes responsible for synthesis of polypeptides of insulin code the same proteins in both bacteria and humans.

❑ ❑ ❑