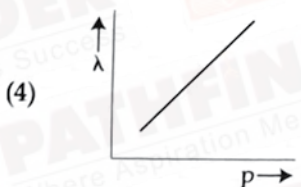## Section - A (Physics)
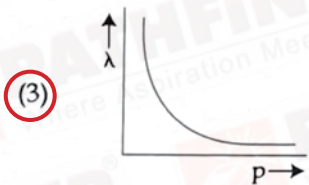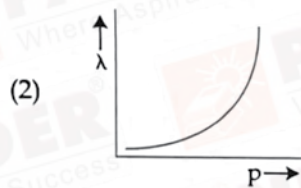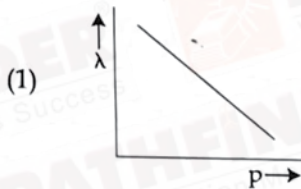
1. If a soap bubble expands, the pressure inside the bubble :

(1) increases

(2) remains the same

(3) is equal to the atmospheric pressure

(4) decreases ✓

2. The graph which shows the variation of the de Broglie wavelength (λ) of a particle and its associated momentum (p) is :

(1)

(2)

(3) ✓

(4)

3. A body of mass 60 g experiences a gravitational force of 3.0 N, when placed at a particular point. The magnitude of the gravitational field intensity at that point is :

(1) 50 N/kg ✓

(2) 20 N/kg

(3) 180 N/kg

(4) 0.05 N/kg

4. Given below are two statements :
Statement I :
Biot-Savart's law gives us the expression for the magnetic field strength of an infinitesimal current element (Idl) of a current carrying conductor only.
Statement II :
Biot-Savart's law is analogous to Coulomb's inverse square law of charge q, with the former being related to the field produced by a scalar source, Idl while the latter being produced by a vector source, q.
In light of above statements choose the **most appropriate** answer from the options given below :

(1) Both **Statement I** and **Statement II** are incorrect

(2) **Statement I** is correct and **Statement II** is incorrect ✓

(3) **Statement I** is incorrect and **Statement II** is correct

(4) Both **Statement I** and **Statement II** are correct

5. The ratio of the distances travelled by a freely falling body in the 1st, 2nd, 3rd and 4th second :

(1) $1 : 4 : 9 : 16$

(2) $1 : 3 : 5 : 7$ ✓

(3) $1 : 1 : 1 : 1$

(4) $1 : 2 : 3 : 4$

6. In half wave rectification, if the input frequency is 60 Hz, then the output frequency would be :

(1) 30 Hz

(2) 60 Hz ✓

(3) 120 Hz

(4) zero

7. A spherical ball is dropped in a long column of a highly viscous liquid. The curve in the graph shown, which represents the speed of the ball (v) as a function of time (t) is :
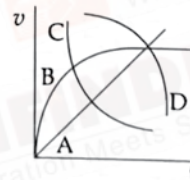
(1) B ✓

(2) C

(3) D

(4) A

8. The angle between the electric lines of force and the equipotential surface is :

(1) 45°

(2) 90° ✓

(3) 180°

(4) 0°

9. As the temperature increases, the electrical resistance :

(1) decreases for both conductors and semiconductors

(2) increases for conductors but decreases for semiconductors

(3) decreases for conductors but increases for semiconductors

(4) increases for both conductors and semiconductors

10. In the given nuclear reaction, the element X is :

$$^{22}_{11}Na \rightarrow X + e^+ + \nu$$

(1) $^{23}_{10}Ne$

(2) $^{22}_{10}Ne$

(3) $^{22}_{12}Mg$

(4) $^{23}_{11}Na$

11. Let T_1 and T_2 be the energy of an electron in the first and second excited states of hydrogen atom, respectively. According to the Bohr's model of an atom, the ratio $T_1 : T_2$ is :

(1) 4 : 1

(2) 4 : 9

(3) 9 : 4

(4) 1 : 4

12. The ratio of the radius of gyration of a thin uniform disc about an axis passing through its centre and normal to its plane to the radius of gyration of the disc about its diameter is :

(1) $\sqrt{2} : 1$

(2) 4 : 1

(3) $1 : \sqrt{2}$

(4) 2 : 1

13. When light propagates through a material medium of relative permittivity ϵ_r and relative permeability μ_r, the velocity of light, v is given by : (c - velocity of light in vacuum)

(1) $v = \sqrt{\dfrac{\mu_r}{\epsilon_r}}$

(2) $v = \sqrt{\dfrac{\epsilon_r}{\mu_r}}$

(3) $v = \dfrac{c}{\sqrt{\epsilon_r \mu_r}}$

(4) $v = c$

14. The energy that will be ideally radiated by a 100 kW transmitter in 1 hour is :

(1) 36×10^4 J

(2) 36×10^5 J

(3) 1×10^5 J

(4) 36×10^7 J

15. An electric lift with a maximum load of 2000 kg (lift + passengers) is moving up with a constant speed of 1.5 ms^{-1}. The frictional force opposing the motion is 3000 N. The minimum power delivered by the motor to the lift in watts is : (g = 10 ms^{-2})

(1) 20000

(2) 34500

(3) 23500

(4) 23000

16. Two resistors of resistance, 100 Ω and 200 Ω are connected in parallel in an electrical circuit. The ratio of the thermal energy developed in 100 Ω to that in 200 Ω in a given time is :

(1) 2 : 1

(2) 1 : 4

(3) 4 : 1

(4) 1 : 2

17. The peak voltage of the ac source is equal to :

(1) the rms value of the ac source

(2) $\sqrt{2}$ times the rms value of the ac source

(3) $1/\sqrt{2}$ times the rms value of the ac source

(4) the value of voltage supplied to the circuit

18. A shell of mass m is at rest initially. It explodes into three fragments having mass in the ratio 2 : 2 : 1. If the fragments having equal mass fly off along mutually perpendicular directions with speed v, the speed of the third (lighter) fragment is :

(1) $\sqrt{2}\, v$

(2) $2\sqrt{2}\, v$

(3) $3\sqrt{2}\, v$

(4) v

19. If the initial tension on a stretched string is doubled, then the ratio of the initial and final speeds of a transverse wave along the string is :

(1) $\sqrt{2} : 1$

(2) $1 : \sqrt{2}$

(3) $1 : 2$

(4) $1 : 1$

20. An ideal gas undergoes four different processes from the same initial state as shown in the figure below. Those processes are adiabatic, isothermal, isobaric and isochoric. The curve which represents the adiabatic process among 1, 2, 3 and 4 is :
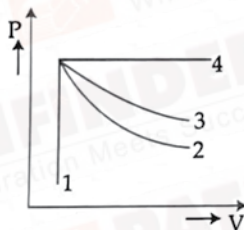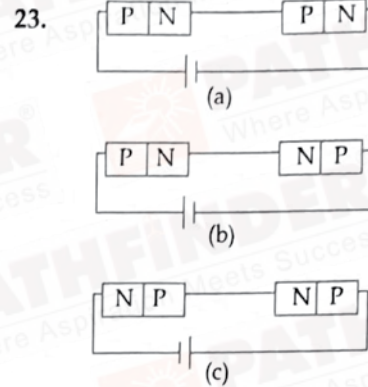

(1) 2

(2) 3

(3) 4

(4) 1

21. The angular speed of a fly wheel moving with uniform angular acceleration changes from 1200 rpm to 3120 rpm in 16 seconds. The angular acceleration in rad/s² is :

(1) 4π

(2) 12π

(3) 104π

(4) 2π

22. Plane angle and solid angle have :

(1) Dimensions but no units

(2) No units and no dimensions

(3) Both units and dimensions

(4) Units but no dimensions

23.

(a)

(b)

(c)

In the given circuits (a), (b) and (c), the potential drop across the two p-n junctions are equal in :

(1) Circuit (b) only

(2) Circuit (c) only

(3) Both circuits (a) and (c)

(4) Circuit (a) only

24. In a Young's double slit experiment, a student observes 8 fringes in a certain segment of screen when a monochromatic light of 600 nm wavelength is used. If the wavelength of light is changed to 400 nm, then the number of fringes he would observe in the same region of the screen is :

(1) 8

(2) 9

(3) 12

(4) 6

25. When two monochromatic lights of frequency, ν and $\dfrac{\nu}{2}$ are incident on a photoelectric metal, their stopping potential becomes $\dfrac{V_s}{2}$ and V_s respectively. The threshold frequency for this metal is :

(1) 3ν

(2) $\dfrac{2}{3}\nu$

(3) $\dfrac{3}{2}\nu$

(4) 2ν

Question is wrong

26. A square loop of side 1 m and resistance 1 Ω is placed in a magnetic field of 0.5 T. If the plane of loop is perpendicular to the direction of magnetic field, the magnetic flux through the loop is :

(1) 0.5 weber

(2) 1 weber

(3) zero weber

(4) 2 weber

27. Two hollow conducting spheres of radii R_1 and R_2 ($R_1 \gg R_2$) have equal charges. The potential would be :
    (1) more on smaller sphere
    (2) equal on both the spheres
    (3) dependent on the material property of the sphere
    (4) more on bigger sphere

28. A copper wire of length 10 m and radius $(10^{-2}/\sqrt{\pi})$ m has electrical resistance of $10\,\Omega$. The current density in the wire for an electric field strength of 10 (V/m) is :
    (1) 10^6 A/m^2
    (2) 10^{-5} A/m^2
    (3) 10^5 A/m^2
    (4) 10^4 A/m^2

29. A long solenoid of radius 1 mm has 100 turns per mm. If 1 A current flows in the solenoid, the magnetic field strength at the centre of the solenoid is :
    (1) 12.56×10^{-2} T
    (2) 12.56×10^{-4} T
    (3) 6.28×10^{-4} T
    (4) 6.28×10^{-2} T

30. Two objects of mass 10 kg and 20 kg respectively are connected to the two ends of a rigid rod of length 10 m with negligible mass. The distance of the center of mass of the system from the 10 kg mass is :
    (1) $\dfrac{20}{3}$ m
    (2) 10 m
    (3) 5 m
    (4) $\dfrac{10}{3}$ m

31. A light ray falls on a glass surface of refractive index $\sqrt{3}$, at an angle 60°. The angle between the refracted and reflected rays would be :
    (1) 60°
    (2) 90°
    (3) 120°
    (4) 30°

32. The dimensions $[MLT^{-2}A^{-2}]$ belong to the :
    (1) self inductance
    (2) magnetic permeability
    (3) electric permittivity
    (4) magnetic flux

33. The displacement-time graphs of two moving particles make angles of 30° and 45° with the x-axis as shown in the figure. The ratio of their respective velocity is :
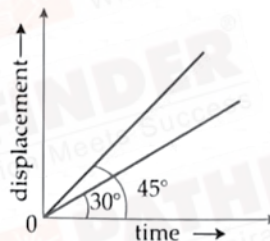
    (1) $1 : 1$
    (2) $1 : 2$
    (3) $1 : \sqrt{3}$
    (4) $\sqrt{3} : 1$

34. A biconvex lens has radii of curvature, 20 cm each. If the refractive index of the material of the lens is 1.5, the power of the lens is :
    (1) $+20$ D
    (2) $+5$D
    (3) infinity
    (4) $+2$D

35. Match List - I with List - II :

List - I (Electromagnetic waves)	List - II (Wavelength)
(a) AM radio waves	(i) 10^{-10} m
(b) Microwaves	(ii) 10^2 m
(c) Infrared radiations	(iii) 10^{-2} m
(d) X-rays	(iv) 10^{-4} m

    Choose the **correct answer** from the options given below :
    (1) (a) - (iii), (b) - (ii), (c) - (i), (d) - (iv)
    (2) (a) - (iii), (b) - (iv), (c) - (ii), (d) - (i)
    (3) (a) - (ii), (b) - (iii), (c) - (iv), (d) - (i)
    (4) (a) - (iv), (b) - (iii), (c) - (ii), (d) - (i)

Section - B (Physics)

36. A nucleus of mass number 189 splits into two nuclei having mass number 125 and 64. The ratio of radius of two daughter nuclei respectively is :
    (1) $4 : 5$
    (2) $5 : 4$
    (3) $25 : 16$
    (4) $1 : 1$

37. Two transparent media A and B are separated by a plane boundary. The speed of light in those media are 1.5×10^8 m/s and 2.0×10^8 m/s, respectively. The critical angle for a ray of light for these two media is :

(1) $\sin^{-1}(0.750)$
(2) $\tan^{-1}(0.500)$
(3) $\tan^{-1}(0.750)$
(4) $\sin^{-1}(0.500)$

38. A big circular coil of 1000 turns and average radius 10 m is rotating about its horizontal diameter at 2 rad s^{-1}. If the vertical component of earth's magnetic field at that place is 2×10^{-5} T and electrical resistance of the coil is 12.56 Ω, then the maximum induced current in the coil will be :

(1) 1.5 A
(2) 1 A
(3) 2 A
(4) 0.25 A

39. Match **List - I** with **List - II** :

	List - I		List - II
(a)	Gravitational constant (G)	(i)	$[L^2T^{-2}]$
(b)	Gravitational potential energy	(ii)	$[M^{-1}L^3T^{-2}]$
(c)	Gravitational potential	(iii)	$[LT^{-2}]$
(d)	Gravitational intensity	(iv)	$[ML^2T^{-2}]$

Choose the **correct answer** from the options given below :

(1) (a) - (ii), (b) - (iv), (c) - (i), (d) - (iii)
(2) (a) - (ii), (b) - (iv), (c) - (iii), (d) - (i)
(3) (a) - (iv), (b) - (ii), (c) - (i), (d) - (iii)
(4) (a) - (ii), (b) - (i), (c) - (iv), (d) - (iii)

40. Given below are two statements : One is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A) :
The stretching of a spring is determined by the shear modulus of the material of the spring.

Reason (R) :
A coil spring of copper has more tensile strength than a steel spring of same dimensions.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) Both **(A)** and **(R)** are true and **(R)** is not the correct explanation of **(A)**
(2) **(A)** is true but **(R)** is false
(3) **(A)** is false but **(R)** is true
(4) Both **(A)** and **(R)** are true and **(R)** is the correct explanation of **(A)**

41. The area of a rectangular field (in m^2) of length 55.3 m and breadth 25 m after rounding off the value for correct significant digits is :

(1) 1382
(2) 1382.5
(3) 14×10^2
(4) 138×10^1

42.
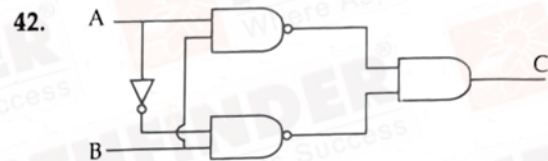
The truth table for the given logic circuit is :

(1)
A	B	C
0	0	1
0	1	0
1	0	0
1	1	1

(2)
A	B	C
0	0	1
0	1	0
1	0	1
1	1	0

(3)
A	B	C
0	0	0
0	1	1
1	0	0
1	1	1

(4)
A	B	C
0	0	0
0	1	1
1	0	1
1	1	0

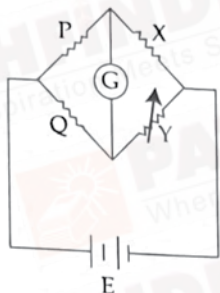**43.** The volume occupied by the molecules contained in 4.5 kg water at STP, if the intermolecular forces vanish away is :

(1) 5.6×10^3 m^3
(2) 5.6×10^{-3} m^3
(3) 5.6 m^3
(4) 5.6×10^6 m^3

44. A wheatstone bridge is used to determine the value of unknown resistance X by adjusting the variable resistance Y as shown in the figure. For the most precise measurement of X, the resistances P and Q :

(1) should be approximately equal and are small
(2) should be very large and unequal
(3) do not play any significant role
(4) should be approximately equal to 2X

45. A series LCR circuit with inductance 10 H, capacitance 10 μF, resistance 50 Ω is connected to an ac source of voltage, V = 200 sin(100 t) volt. If the resonant frequency of the LCR circuit is ν_o and the frequency of the ac source is ν, then :

(1) $\nu_o = \nu = \dfrac{50}{\pi}$ Hz

(2) $\nu_o = \dfrac{50}{\pi}$ Hz , $\nu = 50$ Hz

(3) $\nu = 100$ Hz ; $\nu_o = \dfrac{100}{\pi}$ Hz

(4) $\nu_o = \nu = 50$ Hz

46. A capacitor of capacitance C = 900 pF is charged fully by 100 V battery B as shown in figure (a). Then it is disconnected from the battery and connected to another uncharged capacitor of capacitance C = 900 pF as shown in figure (b). The electrostatic energy stored by the system (b) is :
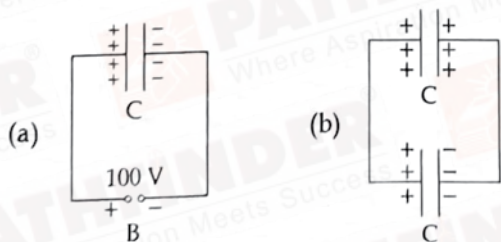
(1) 3.25×10^{-6} J
(2) 2.25×10^{-6} J
(3) 1.5×10^{-6} J
(4) 4.5×10^{-6} J

47. Two point charges −q and +q are placed at a distance of L, as shown in the figure.

The magnitude of electric field intensity at a distance R (R>>L) varies as :

(1) $\dfrac{1}{R^3}$

(2) $\dfrac{1}{R^4}$

(3) $\dfrac{1}{R^6}$

(4) $\dfrac{1}{R^2}$

48. A ball is projected with a velocity, 10 ms^{-1}, at an angle of 60° with the vertical direction. Its speed at the highest point of its trajectory will be :

(1) $5\sqrt{3}$ ms^{-1}
(2) 5 ms^{-1}
(3) 10 ms^{-1}
(4) Zero

49. From Ampere's circuital law for a long straight wire of circular cross-section carrying a steady current, the variation of magnetic field in the inside and outside region of the wire is :

(1) a linearly increasing function of distance upto the boundary of the wire and then linearly decreasing for the outside region.
(2) a linearly increasing function of distance r upto the boundary of the wire and then decreasing one with 1/r dependence for the outside region.
(3) a linearly decreasing function of distance upto the boundary of the wire and then a linearly increasing one for the outside region
(4) uniform and remains constant for both the regions.

50. Two pendulums of length 121 cm and 100 cm start vibrating in phase. At some instant, the two are at their mean position in the same phase. The minimum number of vibrations of the shorter pendulum after which the two are again in phase at the mean position is :

(1) 9
(2) 10
(3) 8
(4) 11

Test Booklet Code **: T6**

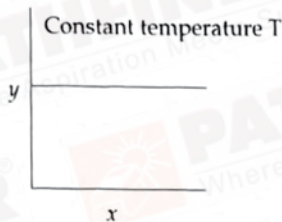# NEET-UG : 2022

Question with Solution
CHEMISTRY

Date : 17.07.2022

Test Booklet Code : **T6**
Question with Answer Key

NEET-UG : 2022

PATHFINDER
Where Aspiration Meets Success

T6   8

Section - A (Chemistry)

51. The given graph is a representation of kinetics of a reaction.

Constant temperature T

The y and x axes for zero and first order reactions, respectively are

(1) zero order (y = concentration and x = time), first order (y = rate constant and x = concentration)

(2) zero order (y = rate and x = concentration), first order (y = $t_{1/2}$ and x = concenration)

(3) zero order (y = rate and x = concentration), first order (y = rate and x = $t_{1/2}$)

(4) zero order (y = concentration and x = time), first order (y = $t_{1/2}$ and x = concentration)

52. Which compound amongst the following is **not** an aromatic compound ?

(1)

(2)

(3)

(4)

53. $RMgX + CO_2 \xrightarrow[\text{ether}]{\text{dry}} Y \xrightarrow{H_3O^+} RCOOH$
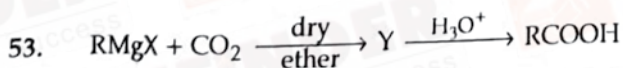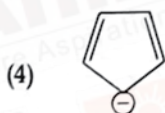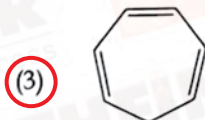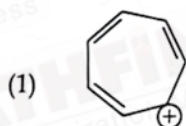
What is Y in the above reaction ?

(1) $R_3CO^-Mg^+X$

(2) $RCOO^-X^+$

(3) $(RCOO)_2Mg$

(4) $RCOO^-Mg^+X$

54. Which of the following statement is **not** correct about diborane ?

(1) The four terminal B-H bonds are two centre two electron bonds.

(2) The four terminal Hydrogen atoms and the two Boron atoms lie in one plane.

(3) Both the Boron atoms are sp^2 hybridised.

(4) There are two 3-centre-2-electron bonds.

55. Gadolinium has a low value of third ionisation enthalpy because of

(1) high exchange enthalpy

(2) high electronegativity

(3) high basic character

(4) small size

56. Which one is **not** correct mathematical equation for Dalton's Law of partial pressure ? Here p = total pressure of gaseous mixture

(1) $p = n_1 \dfrac{RT}{V} + n_2 \dfrac{RT}{V} + n_3 \dfrac{RT}{V}$

(2) $p_i = \chi_i p$, where p_i = partial pressure of ith gas
χ_i = mole fraction of ith gas in gaseous mixture

(3) $p_i = \chi_i p_i^o$, where χ_i = mole fraction of ith gas in gaseous mixture
p_i^o = pressure of ith gas in pure state

(4) $p = p_1 + p_2 + p_3$

57. Given below are two statements :

Statement I :

The boiling points of the following hydrides of group 16 elements increases in the order -

$H_2O < H_2S < H_2Se < H_2Te$.
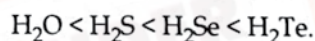
Statement II :

The boiling points of these hydrides increase with increase in molar mass.

In the light of the above statements, choose the most **appropriate** answer from the options given below :

(1) Both **Statement I** and **Statement II** are incorrect

(2) **Statement I** is correct but **Statement II** is incorrect

(3) **Statement I** is incorrect but **Statement II** is correct

(4) Both **Statement I** and **Statement II** are correct

58. Given below are two statements :
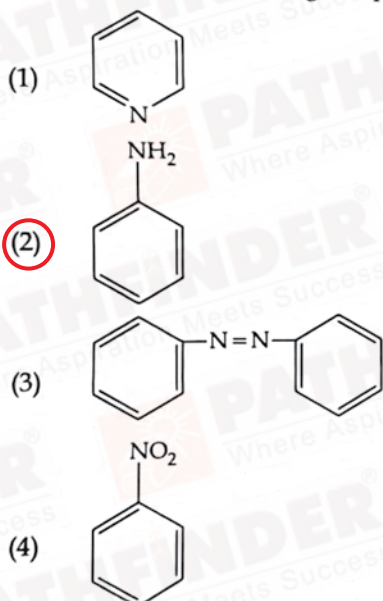**Statement I :**
The acidic strength of monosubstituted nitrophenol is higher than phenol because of electron withdrawing nitro group.
Statement II :
o-nitrophenol, m-nitrophenol and p-nitrophenol will have same acidic strength as they have one nitro group attached to the phenolic ring.
In the light of the above statements, choose the **most appropriate** answer from the options given below :
(1) Both **Statement I** and **Statement II** are incorrect.
(2) **Statement I** is correct but **Statement II** is incorrect.
(3) **Statement I** is incorrect but **Statement II** is correct.
(4) Both **Statement I** and **Statement II** are correct.

59. The Kjeldahl's method for the estimation of nitrogen can be used to estimate the amount of nitrogen in which one of the following compounds ?

(1) [pyridine structure]

(2) [aniline NH₂ structure]

(3) [azobenzene N=N structure]

(4) [nitrobenzene NO₂ structure]

60. Match **List - I** with **List - II**.

	List - I (Drug class)		List - II (Drug molecule)
(a)	Antacids	(i)	Salvarsan
(b)	Antihistamines	(ii)	Morphine
(c)	Analgesics	(iii)	Cimetidine
(d)	Antimicrobials	(iv)	Seldane

Choose the **correct answer** from the options given below :
(1) (a) - (iii), (b) - (iv), (c) - (ii), (d) - (i)
(2) (a) - (i), (b) - (iv), (c) - (ii), (d) - (iii)
(3) (a) - (iv), (b) - (iii), (c) - (i), (d) - (ii)
(4) (a) - (iii), (b) - (ii), (c) - (iv), (d) - (i)

61. The IUPAC name of an element with atomic number 119 is
(1) unnilennium
(2) unununnium
(3) ununoctium
(4) ununennium

62. Amongst the following which one will have maximum 'lone pair - lone pair' electron repulsions ?
(1) IF_5
(2) SF_4
(3) XeF_2
(4) ClF_3

63. Which of the following sequence of reactions is suitable to synthesize chlorobenzene ?
(1) Phenol, $NaNO_2$, HCl, CuCl
(2) [benzene structure], HCl
(3) [aniline NH₂ structure] , HCl, Heating
(4) Benzene, Cl_2, anhydrous $FeCl_3$

64. Which of the following p-V curve represents maximum work done ?

(1) [Isothermal curve p vs V]

(2) [Isothermal curve p vs V]

(3) [Isothermal curve p vs V]

(4) [Isothermal loop p vs V]

Test Booklet Code : **T6**
Question with Answer Key

NEET-UG : 2022

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T6   10
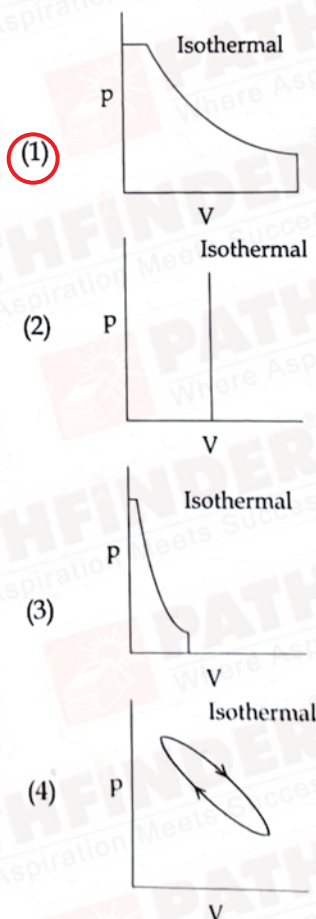
65. Given below are half cell reactions :

$$MnO_4^- + 8\,H^+ + 5\,e^- \rightarrow Mn^{2+} + 4\,H_2O,$$

$$E^{\circ}_{Mn^{2+}/MnO_4^-} = -1.510\ V$$

$$\frac{1}{2}\,O_2 + 2\,H^+ + 2\,e^- \rightarrow H_2O,$$
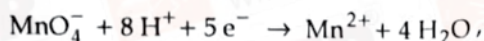
$$E^{\circ}_{O_2/H_2O} = +1.223\ V$$

Will the permanganate ion, MnO_4^- liberate O_2 from water in the presence of an acid ?

(1)   No, because $E^{\circ}_{cell} = -0.287\ V$

(2)   Yes, because $E^{\circ}_{cell} = +2.733\ V$

(3)   No, because $E^{\circ}_{cell} = -2.733\ V$

(4)   Yes, because $E^{\circ}_{cell} = +0.287\ V$

66. The IUPAC name of the complex -
$[Ag(H_2O)_2][Ag(CN)_2]$ is :

(1)   diaquasilver(II) dicyanidoargentate(II)

(2)   dicyanidosilver(I) diaquaargentate(I)

(3)   diaquasilver(I) dicyanidoargentate(I)

(4)   dicyanidosilver(II) diaquaargentate(II)

67. Identify the **incorrect** statement from the following

(1)   The oxidation number of K in KO_2 is $+4$.

(2)   Ionisation enthalpy of alkali metals decreases from top to bottom in the group.

(3)   Lithium is the strongest reducing agent among the alkali metals.

(4)   Alkali metals react with water to form their hydroxides.

68. What mass of 95% pure $CaCO_3$ will be required to neutralise 50 mL of 0.5 M HCl solution according to the following reaction ?

$$CaCO_{3(s)} + 2HCl_{(aq)} \rightarrow CaCl_{2(aq)} + CO_{2(g)} + 2H_2O_{(l)}$$

[Calculate upto second place of decimal point]

(1)   1.32 g

(2)   3.65 g

(3)   9.50 g

(4)   1.25 g

69. Given below are two statements :

Statement I :
Primary aliphatic amines react with HNO_2 to give unstable diazonium salts.

Statement II :
Primary aromatic amines react with HNO_2 to form diazonium salts which are stable even above 300 K.
In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1)   Both **Statement I** and **Statement II** are incorrect.

(2)   Statement I is correct but Statement II is incorrect.

(3)   **Statement I** is incorrect but **Statement II** is correct.

(4)   Both **Statement I** and **Statement II** are correct.

70. Which statement regarding polymers is **not correct** ?

(1)   Fibers possess high tensile strength.

(2)   Thermoplastic polymers are capable of repeatedly softening and hardening on heating and cooling respectively.

(3)   Thermosetting polymers are reusable.

(4)   Elastomers have polymer chains held together by weak intermolecular forces.

71. The **incorrect** statement regarding chirality is :

(1)   The product obtained by S_N2 reaction of haloalkane having chirality at the reactive site shows inversion of configuration.

(2)   Enantiomers are superimposable mirror images on each other.

(3)   A racemic mixture shows zero optical rotation.

(4) S_N1 reaction yields $1:1$ mixture of both enantiomers.

72. Given below are two statements :

Statement I :
In the coagulation of a negative sol, the flocculating power of the three given ions is in the order -
$$Al^{3+} > Ba^{2+} > Na^+$$

Statement II :
In the coagulation of a positive sol, the flocculating power of the three given salts is in the order -
$$NaCl > Na_2SO_4 > Na_3PO_4$$

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1)   Both **Statement I** and **Statement II** are incorrect.

(2)   Statement I is correct but Statement II is incorrect.

(3)   **Statement I** is incorrect but **Statement II** is correct.

(4)   Both **Statement I** and **Statement II** are correct.

73. Match **List - I** with **List - II**.

List - I (Hydrides)		List - II (Nature)	
(a)	MgH_2	(i)	Electron precise
(b)	GeH_4	(ii)	Electron deficient
(c)	B_2H_6	(iii)	Electron rich
(d)	HF	(iv)	Ionic

Choose the **correct answer** from the options given below :

(1) (a) - (iii), (b) - (i), (c) - (ii), (d) - (iv)
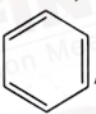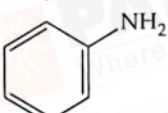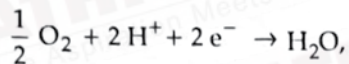(2) (a) - (i), (b) - (ii), (c) - (iv), (d) - (iii)
(3) (a) - (ii), (b) - (iii), (c) - (iv), (d) - (i)
(4) (a) - (iv), (b) - (i), (c) - (ii), (d) - (iii)

74. Match **List - I** with **List - II**.

List - I		List - II	
(a)	Li	(i)	absorbent for carbon dioxide
(b)	Na	(ii)	electrochemical cells
(c)	KOH	(iii)	coolant in fast breeder reactors
(d)	Cs	(iv)	photoelectric cell

Choose the **correct answer** from the options given below :

(1) (a) - (iii), (b) - (iv), (c) - (ii), (d) - (i)
(2) (a) - (i), (b) - (iii), (c) - (iv), (d) - (ii)
(3) (a) - (ii), (b) - (iii), (c) - (i), (d) - (iv)
(4) (a) - (iv), (b) - (i), (c) - (iii), (d) - (ii)

75. Given below are two statements : one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A) :
In a particular point defect, an ionic solid is electrically neutral, even if few of its cations are missing from its unit cells.

Reason (R) :
In an ionic solid, Frenkel defect arises due to dislocation of cation from its lattice site to interstitial site, maintaining overall electrical neutrality.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) Both **(A)** and **(R)** are correct but **(R)** is not the correct explanation of **(A)**
(2) **(A)** is correct but **(R)** is not correct
(3) **(A)** is not correct but **(R)** is correct
(4) Both **(A)** and **(R)** are correct and **(R)** is the correct explanation of **(A)**

76. The **incorrect** statement regarding enzymes is :

(1) Like chemical catalysts enzymes reduce the activation energy of bio processes.
(2) Enzymes are polysaccharides.
(3) Enzymes are very specific for a particular reaction and substrate.
(4) Enzymes are biocatalysts.

77. Match **List - I** with **List - II**.

List - I (Products formed)		List - II (Reaction of carbonyl compound with)	
(a)	Cyanohydrin	(i)	NH_2OH
(b)	Acetal	(ii)	RNH_2
(c)	Schiff's base	(iii)	alcohol
(d)	Oxime	(iv)	HCN

Choose the **correct answer** from the options given below :

(1) (a) - (ii), (b) - (iii), (c) - (iv), (d) - (i)
(2) (a) - (i), (b) - (iii), (c) - (ii), (d) - (iv)
(3) (a) - (iv), (b) - (iii), (c) - (ii), (d) - (i)
(4) (a) - (iii), (b) - (iv), (c) - (ii), (d) - (i)

78. In one molal solution that contains 0.5 mole of a solute, there is

(1) 500 g of solvent
(2) 100 mL of solvent
(3) 1000 g of solvent
(4) 500 mL of solvent

79. Choose the **correct** statement :

(1) Diamond is covalent and graphite is ionic.
(2) Diamond is sp^3 hybridised and graphite is sp^2 hybridized.
(3) Both diamond and graphite are used as dry lubricants.
(4) Diamond and graphite have two dimensional network.

80. Which amongst the following is **incorrect** statement ?

(1) C_2 molecule has four electrons in its two degenerate π molecular orbitals.
(2) H_2^+ ion has one electron.
(3) O_2^+ ion is diamagnetic.
(4) The bond orders of O_2^+, O_2, O_2^- and O_2^{2-} are 2.5, 2, 1.5 and 1, respectively.

81. Given below are two statements : one is labelled as **Assertion (A)** and the other is labelled as **Reason (R)**.

Assertion (A) : ICl is more reactive than I_2.
Reason (R) : I-Cl bond is weaker than I-I bond.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) Both **(A)** and **(R)** are correct but **(R)** is not the correct explanation of **(A)**.
(2) **(A)** is correct but **(R)** is not correct.
(3) **(A)** is not correct but **(R)** is correct.
(4) Both **(A)** and **(R)** are correct and **(R)** is the correct explanation of **(A)**.

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82. Given below are two statements :

Statement I :

The boiling points of aldehydes and ketones are higher than hydrocarbons of comparable molecular masses because of weak molecular association in aldehydes and ketones due to dipole - dipole interactions.

Statement II :

The boiling points of aldehydes and ketones are lower than the alcohols of similar molecular masses due to the absence of H-bonding.

In the light of the above statements, choose the **most appropriate** answer from the options given below :

(1) Both **Statement I** and **Statement II** are incorrect.

(2) **Statement I** is correct but **Statement II** is incorrect.

(3) **Statement I** is incorrect but **Statement II** is correct.

(4) Both **Statement I** and **Statement II** are correct.

83. The pH of the solution containing 50 mL each of 0.10 M sodium acetate and 0.01 M acetic acid is
[Given pK_a of $CH_3COOH = 4.57$]

(1) 3.57

(2) 4.57

(3) 2.57

(4) 5.57

84. Identify the incorrect statement from the following.

(1) All the five 4d orbitals have shapes similar to the respective 3d orbitals.

(2) In an atom, all the five 3d orbitals are equal in energy in free state.

(3) The shapes of d_{xy}, d_{yz}, and d_{zx} orbitals are similar to each other ; and $d_{x^2-y^2}$ and d_{z^2} are similar to each other.

(4) All the five 5d orbitals are different in size when compared to the respective 4d orbitals.

85. At 298 K, the standard electrode potentials of Cu^{2+}/Cu, Zn^{2+}/Zn, Fe^{2+}/Fe and Ag^+/Ag are 0.34 V, -0.76 V, -0.44 V and 0.80 V, respectively.

On the basis of standard electrode potential, predict which of the following reaction can not occur ?

(1) $CuSO_4(aq) + Fe(s) \rightarrow FeSO_4(aq) + Cu(s)$

(2) $FeSO_4(aq) + Zn(s) \rightarrow ZnSO_4(aq) + Fe(s)$

(3) $2CuSO_4(aq) + 2Ag(s) \rightarrow 2Cu(s) + Ag_2SO_4(aq)$

(4) $CuSO_4(aq) + Zn(s) \rightarrow ZnSO_4(aq) + Cu(s)$

Section - B (Chemistry)

86. The order of energy absorbed which is responsible for the color of complexes

(A) $[Ni(H_2O)_2(en)_2]^{2+}$
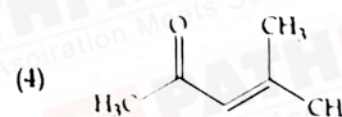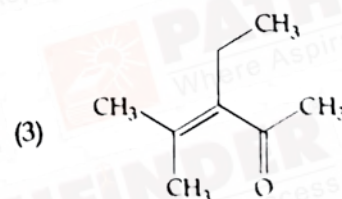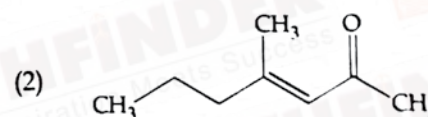
(B) $[Ni(H_2O)_4(en)]^{2+}$ and

(C) $[Ni(en)_3]^{2+}$

is

(1) (C) > (B) > (A)

(2) (C) > (A) > (B)

(3) (B) > (A) > (C)

(4) (A) > (B) > (C)

87. A 10.0 L flask contains 64 g of oxygen at 27°C. (Assume O_2 gas is behaving ideally). The pressure inside the flask in bar is

(Given $R = 0.0831$ L bar K^{-1} mol^{-1})

(1) 498.6

(2) 49.8

(3) 4.9

(4) 2.5

88. Which one of the following is **not** formed when acetone reacts with 2-pentanone in the presence of dilute NaOH followed by heating ?

(1)

(2)

(3)

(4)
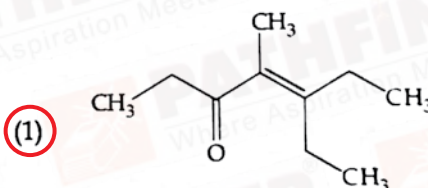
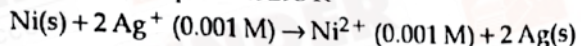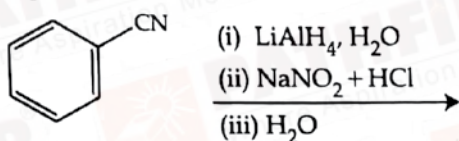89. Find the emf of the cell in which the following reaction takes place at 298 K

$$Ni(s) + 2 Ag^+ (0.001 M) \rightarrow Ni^{2+} (0.001 M) + 2 Ag(s)$$

(Given that $E^\circ_{cell} = 10.5 V$, $\dfrac{2.303 RT}{F} = 0.059$ at 298 K)

(1) 1.385 V

(2) 0.9615 V

(3) 1.05 V

(4) 1.0385 V

Bonus(All option incorrect due to misprinting)

90. The product formed from the following reaction sequence is

[structure: benzene ring with CN group]

(i) $LiAlH_4$, H_2O
(ii) $NaNO_2 + HCl$
(iii) H_2O

(1) [structure: benzene ring with $\overset{\oplus}{N_2}\overset{\ominus}{Cl}$]

(2) [structure: benzene ring with CH_2Cl]

(3) [structure: benzene ring with CH_2OH]

(4) [structure: benzene ring with $C(=O)NH_2$]

91. Copper crystallises in fcc unit cell with cell edge length of 3.608×10^{-8} cm. The density of copper is 8.92 g cm^{-3}. Calculate the atomic mass of copper.

(1) 31.55 u

(2) 60 u

(3) 65 u

(4) 63.1 u

92. $3 O_2(g) \rightleftharpoons 2 O_3(g)$
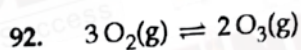
for the above reaction at 298 K, K_c is found to be 3.0×10^{-59}. If the concentration of O_2 at equilibrium is 0.040 M then concentration of O_3 in M is

(1) 1.9×10^{-63}

(2) 2.4×10^{31}

(3) 1.2×10^{21}

(4) 4.38×10^{-32}

93. Given below are two statements :

Statement I :

In Lucas test, primary, secondary and tertiary alcohols are distinguished on the basis of their reactivity with conc. $HCl + ZnCl_2$, known as Lucas Reagent.

Statement II :

Primary alcohols are most reactive and immediately produce turbidity at room temperature on reaction with Lucas Reagent.

In the light of the above statements, choose the **most** appropriate answer from the options given below :

(1) Both **Statement I** and **Statement II** are incorrect.

(2) **Statement I** is correct but **Statement II** is incorrect.

(3) **Statement I** is incorrect but **Statement II** is correct.

(4) Both **Statement I** and **Statement II** are correct.

94. In the neutral or faintly alkaline medium, $KMnO_4$ oxidises iodide into iodate. The change in oxidation state of manganese in this reaction is from

(1) $+6$ to $+4$

(2) $+7$ to $+3$

(3) $+6$ to $+5$

(4) $+7$ to $+4$

95. Match List - I with List - II.

List - I (Ores)		List - II (Composition)	
(a)	Haematite	(i)	Fe_3O_4
(b)	Magnetite	(ii)	$ZnCO_3$
(c)	Calamine	(iii)	Fe_2O_3
(d)	Kaolinite	(iv)	$[Al_2(OH)_4 Si_2O_5]$

Choose the **correct answer** from the options given below :

(1) (a) - (iii), (b) - (i), (c) - (ii), (d) - (iv)

(2) (a) - (iii), (b) - (i), (c) - (iv), (d) - (ii)

(3) (a) - (i), (b) - (iii), (c) - (ii), (d) - (iv)

(4) (a) - (i), (b) - (ii), (c) - (iii), (d) - (iv)

96. The correct IUPAC name of the following compound is :

[structure: carbon chain with Cl, OH, methyl branch, and Br]
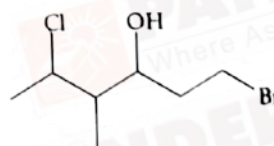
(1) 6-bromo-2-chloro-4-methylhexan-4-ol

(2) 1-bromo-4-methyl-5-chlorohexan-3-ol

(3) 6-bromo-4-methyl-2-chlorohexan-4-ol

(4) 1-bromo-5-chloro-4-methylhexan-3-ol

Test Booklet Code : **T6**
Question with Answer Key

NEET-UG : 2022

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T6   14

97. If radius of second Bohr orbit of the He$^+$ ion is 105.8 pm, what is the radius of third Bohr orbit of Li^{2+} ion ?

(1)   15.87 pm

(2)   1.587 pm

(3)   158.7 Å

(4)   158.7 pm

98. Compound X on reaction with O_3 followed by Zn/H_2O gives formaldehyde and 2-methyl propanal as products. The compound X is :

(1)   2-Methylbut-1-ene

(2)   2-Methylbut-2-ene

(3)   Pent-2-ene

(4)   3-Methylbut-1-ene

99. For a first order reaction A $\rightarrow$ Products, initial concentration of A is 0.1 M, which becomes 0.001 M after 5 minutes. Rate constant for the reaction in min^{-1} is

(1)   0.9212

(2)   0.4606

(3)   0.2303

(4)   1.3818

100. The pollution due to oxides of sulphur gets enhanced due to the presence of :

(a)   particulate matter

(b)   ozone

(c)   hydrocarbons

(d)   hydrogen peroxide

Choose the **most appropriate** answer from the options given below :

(1)   (a), (b), (d) only

(2)   (b), (c), (d) only

(3)   (a), (c), (d) only

(4)   (a), (d) only

Section - A (Biology : Botany)

101. Which of the following is not a method of *ex situ* conservation ?

(1)   National Parks

(2)   Micropropagation

(3)   Cryopreservation

(4)   *In vitro* fertilization

102. Given below are two statements :

Statement I :
The primary CO_2 acceptor in C_4 plants is phosphoenolpyruvate and is found in the mesophyll cells.

Statement II :
Mesophyll cells of C_4 plants lack RuBisCo enzyme.

In the light of the above statements, choose the **correct** answer from the options given below :

(1)   Both **Statement I** and **Statement II** are incorrect

(2)   **Statement I** is correct but **Statement II** is incorrect

(3)   **Statement I** is incorrect but **Statement II** is correct

(4)   Both **Statement I** and **Statement II** are correct

103. XO type of sex determination can be found in :

(1)   Birds

(2)   Grasshoppers

(3)   Monkeys

(4)   *Drosophila*

104. In old trees the greater part of secondary xylem is dark brown and resistant to insect attack due to :

(a)   secretion of secondary metabolities and their deposition in the lumen of vessels.

(b)   deposition of organic compounds like tannins and resins in the central layers of stem.

(c)   deposition of suberin and aromatic substances in the outer layer of stem.

(d)   deposition of tannins, gum, resin and aromatic substances in the peripheral layers of stem.

(e)   presence of parenchyma cells, functionally active xylem elements and essential oils.

Choose the **correct answer** from the options given below :

(1)   (c) and (d) Only

(2)   (d) and (e) Only

(3)   (b) and (d) Only

(4)   (a) and (b) Only

105. Which of the following is **not** observed during apoplastic pathway ?

(1)   The movement does not involve crossing of cell membrane

(2)   The movement is aided by cytoplasmic streaming

(3)   Apoplast is continuous and does not provide any barrier to water movement.

(4)   Movement of water occurs through intercellular spaces and wall of the cells.