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आपकी प्रतिभा, हमारा मंच - ब्रेन ऑफ़ हिमाचल

ASPIRE TALENT HUNT EXAM-2025

For 5th ,6th , 7th , 8th , 9th 10th , (11th & 12th Science)

SAPMLE TEST PAPER

CLASS 12th

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PHYSICS 12th BOH

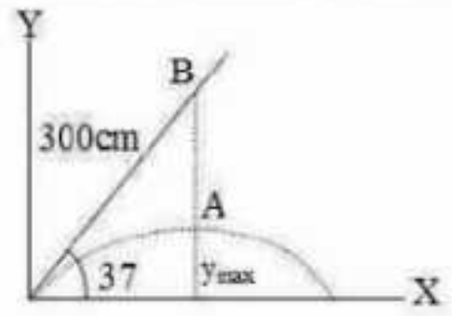
Q.1 The mass of a lift is 2000 kg. When the tension in the supporting cable is 28000 N then its acceleration is:

A) 4 m/s^2 upwards
B) 4 m/s^2 downwards
C) 14 m/s^2 upwards
D) 30 m/s^2 downwards

Q.2 The seave of a galvanometer of resistance 100Ω contains 25 divisions. It gives a deflection of one division on passing a current of 4×10^{-4} A. The resistance in ohm to be added to it, so that it may become a voltmeter of range 2.5 V is

A) 150 B) 170 C) 110 D) 220

Q.3 A ball A is projected from origin with an initial velocity v_0 = 700 cm /s, in a direction 37° above the horizontal as shown in fig. Another ball B, 300 cm from origin on a line 37° above the horizontal, is released from rest at the instant A starts. How far will B have fallen when it is hit by A?

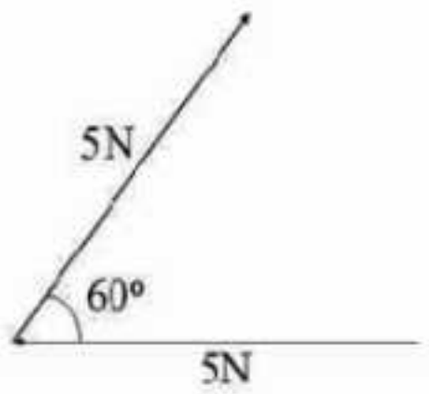


A) 90 cm B) 80 cm C) 70 cm D) 60 cm

Q.4 If wavelength of the energy emitted when electron comes from fourth orbit to second orbit in hydrogen is 20397 unit. The wavelength of energy for the same transition in $_2He^4$ is

A) 5099 unit B) 20497 unit C) 40994 unit D) 81988 unit

Q.5 Two force, each numerically equal to 5 N, are acting as shown in the figure. Then the resultant is

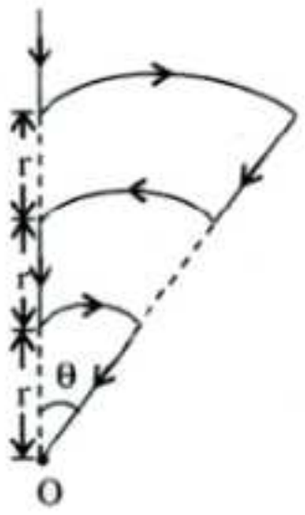


A) 2.5 N B) 5 N C) $5\sqrt{3}$ N D) 10 N

Q.6 The acceleration of a particle increases linearly with time t as '6t'. If the initial velocity of the particle is zero and the particle starts from the origin, then the distance travelled by the particle in time t will be-

A) t B) t^2 C) t^3 D) t^4

Q.7 Shown in the figure is a conductor carrying a current I. The magnetic field intensity at the point O (common centre of all the three arcs) is-



A) $\frac{5\mu_0 I\theta}{24\pi r}$ B) $\frac{\mu_0 I\theta}{24\pi r}$ C) $\frac{1\mu_0 I\theta}{24\pi r}$ D) zero

Q.8 An electric dipole of length 1 cm is placed with the axis making an angle of 30° to an electric field of strength $10^4\ NC^{-1}$. If its experiences a torque of $10\sqrt{2}$ Nm, the potential energy of the dipole is

A) 0.245 J B) 2.45×10^{-4} J C) 0.0245 J D) 24.5 J

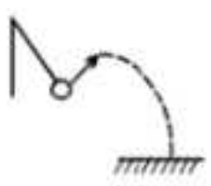
Q.9 A sound increases its decibel reading from 20 to 40 dB. This means that the intensity of the sound.

A) Is doubled
B) Is 20 times greater
C) Is 100 times greater
D) Is the old intensity + 20

Q.10 One microscope slide is placed on top of another with their left edges in contact and a human hair under the right edge of the upper slide. As a result, a wedge of air exists between the slides. An interference pattern results when monochromatic light is incident on the wedge. Choose incorrect statement.

A) A dark fringe is seen at the left edges of slides.
B) A bright fringe is seen at the left edges of slides.
C) The fringes are straight of equal thickness.
D) Fringes are localized.

Q.11 A pendulum bob is swinging in a vertical plane such that its angular amplitude is less than 90°. At its highest point, the string is cut. Which trajectory is possible for the bob afterwards?

A)  B)  C)  D) 

Q.12 **Statement-1:** Net electric field inside cavity of a conductor is due to charges placed inside cavity and charge appearing on inner surface of cavity.
Statement-2: Individual electric field created by each of the charges outside the conductor is zero at all points inside the cavity.

A) Statement-1 is true, statement-2 is true and statement-2 is correct explanation for statement-1.
B) Statement-1 is true, statement-2 is true and statement-2 is NOT the correct explanation for statement-1.
C) Statement-1 is true, statement-2 is false.
D) Statement-1 is false, statement-2 is true.

Q.13 A particle at the end of a spring executes simple harmonic motion with a period t_1, while the corresponding period for another spring is t_2. If the period of oscillation with the two springs in series is T, then

A) $T^2 = t_1^2 + t_2^2$ B) $T = t_1 + t_2$ C) $T^{-1} = t_1^{-1} + t_2^{-1}$ D) $T^{-2} = t_1^{-2} + t_2^{-2}$

Q.14 A swimmer can swim in a river with a speed of 5 kmh^{-1}. He wants to cross the river of width 10 km. The river flow velocity is 3 kmh^{-1}. He wants to reach the opposite point of the bank. Mark the correct option(s).

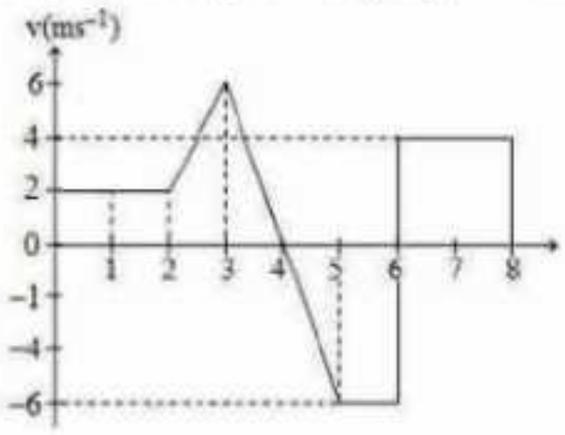
A) Swimmer is headed at 127° with river flow direction

B) Swimmer is headed at 37° with river flow direction

C) Time taken by the swimmer to cross the river is 2.5 h

D) Time taken by the swimmer to cross the river is 2 h

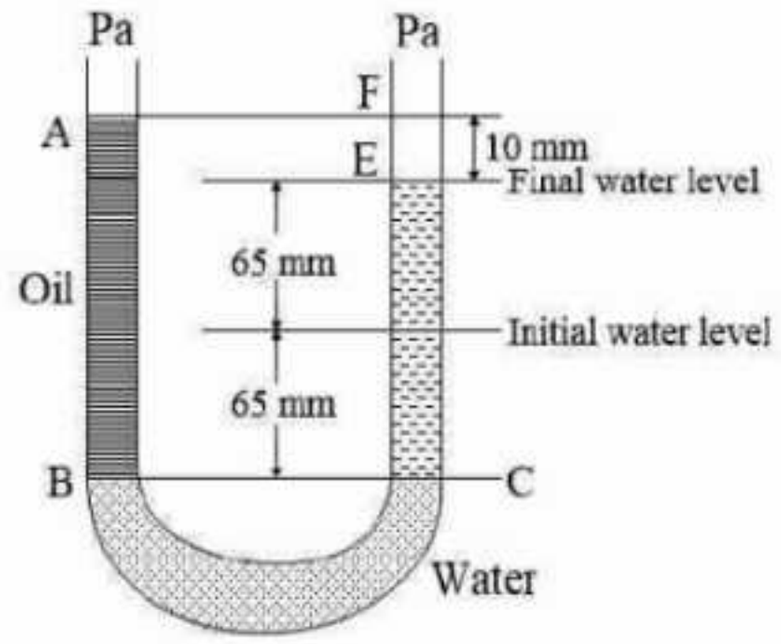
Q.15 The velocity-time graph of a body is shown in fig. The displacement of the body in 8 s is



A) 9 m B) 12 m C) 10 m D) 28 m

Q.16

A U tube with both ends open to the atmosphere is partially filled with water. Oil, which is immiscible with water, is poured into one side until it stands at a distance of 10 mm above the water level on the other side, meanwhile the water rises by 65 mm from its original level (see diagram). The density of the oil is:-



A) 425 Kg m^{-3} B) 800 kg m^{-3} C) 928 kg m^{-3} D) 650 Kg m^{-3}

Q.17 Dimensional formula for thermal conductivity is (here K denotes the temperature)

A) $MLT^{-2}K$ B) $MLT^{-3}K^{-1}$ C) $MLT^{-3}K$ D) $MLT^{-2}K^{-2}$

Q.18 A 2 kg mass starts from rest on an inclined smooth surface with inclination 30° and length 2 m. How much will it travel before coming to rest on a frictional horizontal surface with frictional coefficient of 0.25?

A) 4 m B) 6 m C) 8 m D) 2 m

Q.19 A galvanometer of resistance 'G' is shunted by a resistance of 5 Ω. To keep the main current in the circuit unchanged, the resistance to be put in series with the same galvanometer is

A) $\frac{G^2}{G+S}$ B) $\frac{5G}{S+G}$ C) $\frac{G}{S+G}$ D) $\frac{S^2}{S+G}$

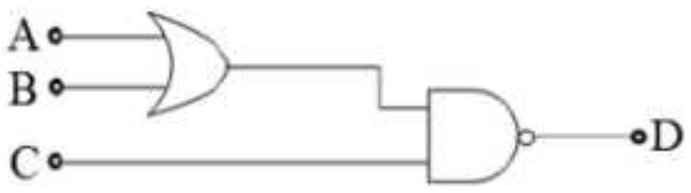
Q.20 A body is rotating about its own axis. Its rotational kinetic energy is 'x' and its angular momentum is 'y'. Hence its moment of inertia about the axis is

A) $\frac{x^2}{2y}$ B) $\frac{y}{2x}$ C) $\frac{x}{2y}$ D) $\frac{y^2}{2x}$

Q.21 A weightless string can support a tension up to $30\,N$. A stone of mass $0.5\,kg$ is tied to its one end and is revolved in a circular path of radius $2\,m$ in a vertical plane. Then the maximum angular velocity of the stone will be (acceleration due to gravity $g = 10\,m/s^2$)

A) $10 rad/s$ B) $\sqrt{60}\,rad/s$ C) $\sqrt{30}\,rad/s$ D) $5 rad/s$

Q.22 For a given combination of logic gates, the inputs A, B and C are as follows. $A = B = C = 0$ and $A = B = 1, C = 0$ then the logic states of output D are respectively



A) $0, 0$ B) $0, 1$ C) $1, 0$ D) $1, 1$

Q.23 The mass and radius of the earth and moon are M, R and m, r respectively. The distance between their centers is d. The minimum velocity with which a particle of mass m_0 should be projected from the midpoint between them so that it could reach infinity is

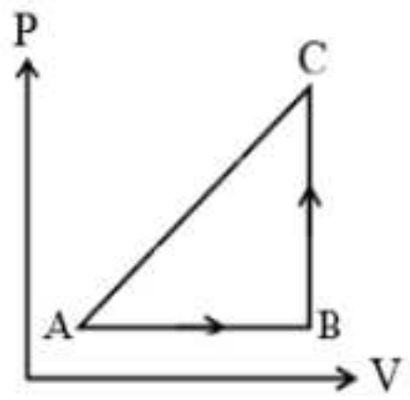
A) $2\sqrt{\frac{G}{d}(M+m)}$ B) $2\sqrt{\frac{Gm}{d}(M+m)}$

C) $2\sqrt{\frac{2G}{d}(M+m)}$ D) $2\sqrt{\frac{Gm(M+m)}{d(R+r)}}$

Q.24 A square wire frame of each side L is dipped in soap solution. On taking out, a membrane is formed. If the surface tension of solution is T, the force acting on the frame will be

A) $8TL$ B) $10TL$ C) $2TL$ D) $54TL$

Q.25 The $p-V$ diagram of a system undergoing thermodynamic changes is as shown in the figure. The work done by the system in going from $A \to B \to C$ is $30\,J$. If $68\,J$ of heat is given to the system, then the change in the internal energy of the system between A and C is



A) $34\,J$ B) $55\,J$ C) $50\,J$ D) $38\,J$

Q.26 Two monoatomic ideal gases A and B of molecular masses m_1 and m_2 respectively, are enclosed in separate containers kept at the same temperature. The ratio of the speed of sound in gas A to that in gas B is given by

A) $\sqrt{\frac{m_2}{m_1}}$ B) $\frac{m_1}{m_2}$ C) $\sqrt{\frac{m_1}{m_2}}$ D) $\frac{m_2}{m_1}$

Q.27 A door 1.2 mwide requires a force of 1 N to be applied perpendicular at the free end to open or close it. The perpendicular force required at a point 0.2 mdistant from the hinges for opening or closing the door is

A) 2.4 N B) 3.6 N C) 6.0 N D) 1.2 N

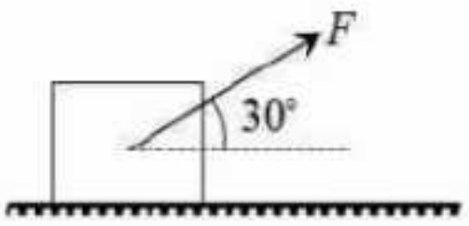
Q.28 In a medium, the phase difference between two particles separated by a distance x is $\left(\frac{\pi}{5}\right)^c$. If the frequency of the oscillation of particles is 25 Hz and the velocity of propagation of the wave is 75 m/s, then the value of x is

A) 0.1 m B) 0.2 m C) 0.3 m D) 0.4 m

Q.29 Two circular coils 1 and 2 are made from the same wire but the radius of the first coil is twice that of the second coil. What is the ratio of potential difference applied across them, so that the magnetic field at their centres is same?

A) 2:3 B) 6:4 C) 3:2 D) 4:1

Q.30 As shown in the figure a block of mass 10 kg lying on a horizontal surface is pulled by a force F acting at an angle 30°, with horizontal. For $\mu_s = 0.25$, the block will just start to move for the value of F: [Given $g = 10\,ms^{-2}$]

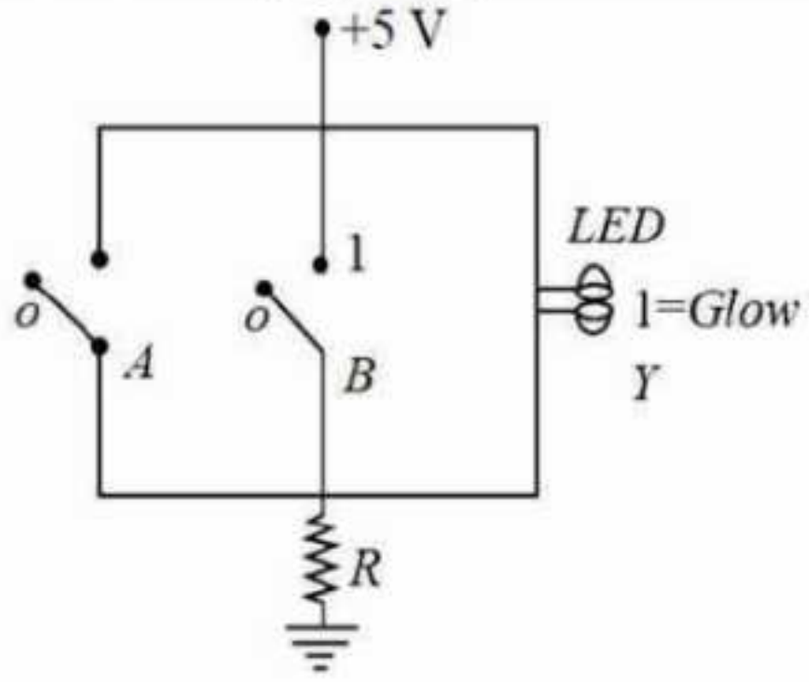


A) 20 N B) 35.7 N C) 33.3 N D) 25.2 N

Q.31 If two vectors $\vec{P} = \hat{i} + 2m\hat{j} + m\hat{k}$ and $\vec{Q} = 4\hat{i} - 2\hat{j} + m\hat{k}$ are perpendicular to each other. Then, the value of m will be

A) -1 B) 2 C) 3 D) 1

Q.32 Name the logic gate equivalent to the diagram attached:



A) NOR B) NAND C) OR D) AND

Q.33 The main scale of a spectrometer is divided into 720 division in all. If the vernier scale consists of 30 divisions the least count of the instrument is – (30 division of vernier scale coincide with 29 division of main scale)

A) 0.1° B) $1''$ C) $1'$ D) $0.1''$

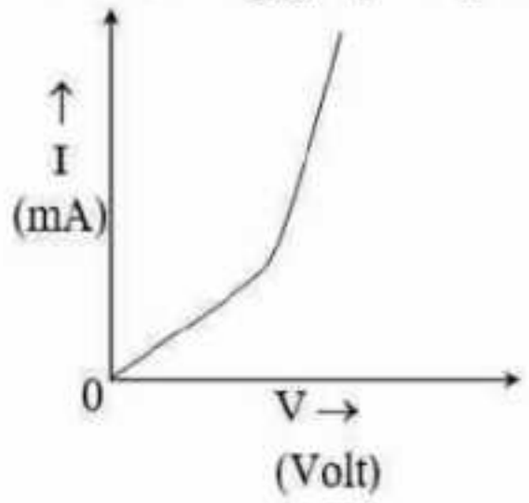
Q.34 The magnetic moment of a current (I) carrying circular coil of radius 'r' and number of turns 'n' depends on

A) n only B) I only C) r only D) n, I and r

Q.35 When radiation of wavelength 'λ' is incident on a metallic surface, the stopping potential is 4.8 V. If the surface is illuminated with radiation of double the wavelength then the stopping potential becomes 1.6 V. The threshold wavelength for the surface is

A) 2λ B) 4λ C) 6λ D) 8λ

Q.36 The following graph represents



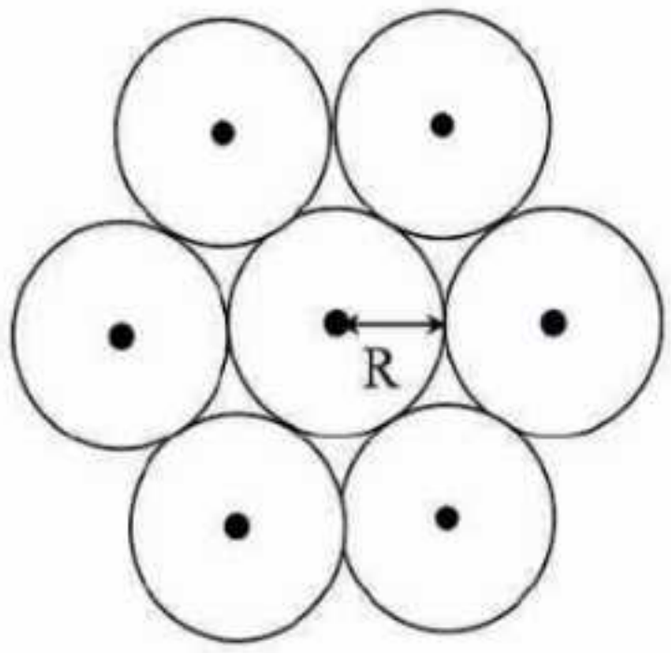
A) forward bias characteristics of a solar cell

B) reverse bias characteristics of a Zener diode

C) reverse bias characteristics of photodiode

D) forward bias characteristics of a LED

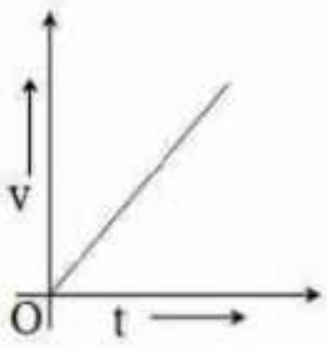
Q.37 Seven identical discs each of mass M and radius R are arranged in a hexagonal plane pattern so as to touch each neighbor disc as shown in the figure. The moment of inertia of the system of seven discs about an axis passing through the centre of central disc and normal to the plane of all discs is



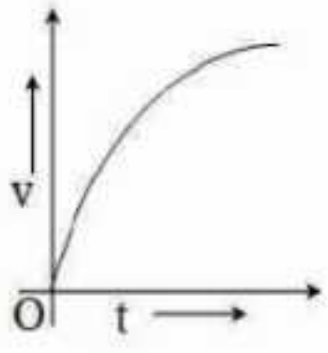
A) $\frac{7}{2}MR^2$ B) $\frac{13}{2}MR^2$ C) $\frac{29}{2}MR^2$ D) $\frac{55}{2}MR^2$

Q.38 A body dropped in a viscous liquid. The motion of body can described by velocity time graph as -

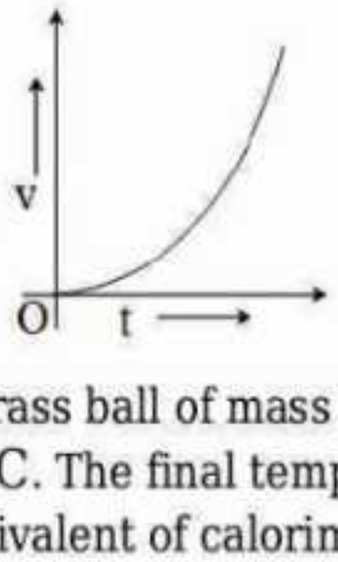
A)



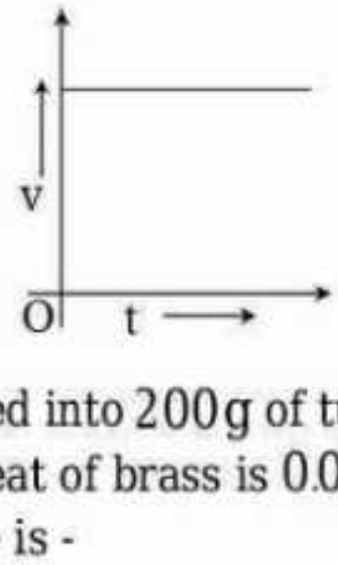
B)



C)



D)



Q.39 A brass ball of mass $100\,g$ is heated to $100^\circ C$ and then dropped into $200\,g$ of turpentine in a calorimeter at $15^\circ C$. The final temperature is found to be $23^\circ C$. If specific heat of brass is $0.092\,cal/g^\circ C$ and water equivalent of calorimeter is $4\,g$, the specific heat of turpentine is -

A) $0.07\,cal/g^\circ C$ B) $0.21\,cal/g^\circ C$ C) $0.35\,cal/g^\circ C$ D) $0.42\,cal/g^\circ C$

Q.40 A body is released from the top of a tower 'H' meter high. It takes t seconds to reach the ground. The height of the body $\frac{t}{2}$ second after release is

A) $\frac{H}{2}$ meter from ground

B) $\frac{H}{4}$ meter from ground

C) $3\frac{H}{4}$ meter from ground

D) $\frac{H}{6}$ meter from ground

Q.41 The de-Broglie wave length (λ) of a particle is related to its kinetic energy (E) as

A) $\lambda \alpha E$

B) $\lambda \alpha E^{-1}$

C) $\lambda \alpha E^{\frac{1}{2}}$

D) $\lambda \alpha E^{\frac{-1}{2}}$

Q.42 If Z_1 and Z_2 are the impedances of the given circuits (A) and (B) as shown in figures, then choose the correct option

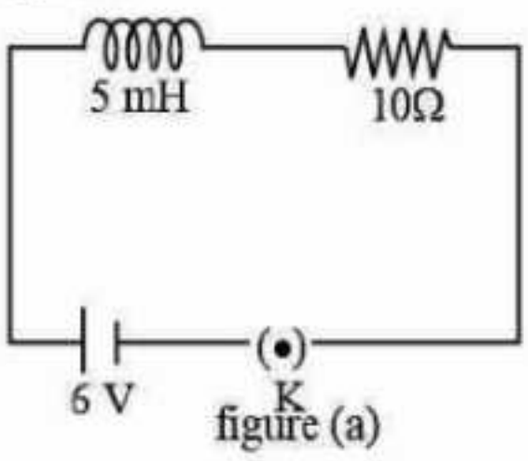


figure (a)

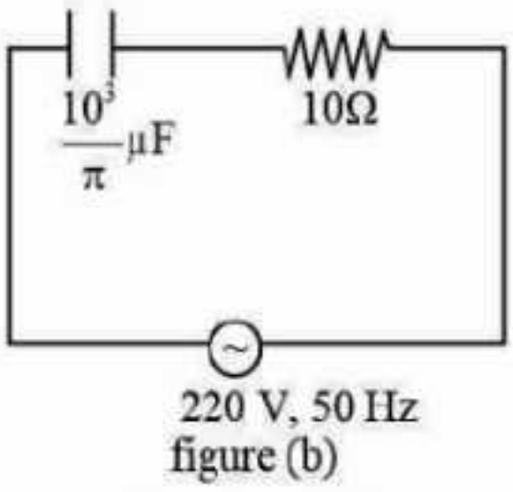


figure (b)

A) $Z_1 < Z_2$

B) $Z_1 + Z_2 = 20\Omega$

C) $Z_1 = Z_2$

D) $Z_1 > Z_2$

Q.43 The explosive in a hydrogen bomb is a mixture of ${}_1H^2$, ${}_1H^3$ and ${}_3Li^6$ in some condensed form. The chain reaction is given by ${}_3Li^6 + {}_0n^1 \rightarrow {}_2He^4 + {}_1H^3$

${}_1H^2 + {}_1H^3 \rightarrow {}_2He^4 + {}_0n^1$

During the explosion the energy released is approximately

[Given : M(Li) = 601690 amu, $M({}_1H^2)$ = 201471 amu, $M({}_2He^4)$ = 400388 amu, and 1 amu = 931.5 MeV]

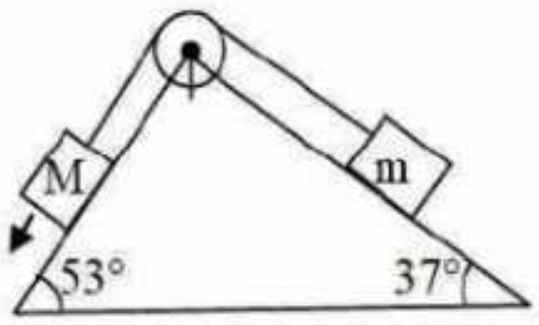
A) 22.22 MeV

B) 16.48 MeV

C) 28.12 MeV

D) 12.64 MeV

Q.44 In the given arrangement of a doubly inclined plane two blocks M and m are placed. The blocks are connected by a light string passing over an ideal pulley as shown. The coefficient of friction between the surface of the plane and the blocks is 0.25. The value of m, for which $M = 10\,kg$ will move down with an acceleration of $2\,m/s^2$, is: (take $g = 10\,m/s^2$ and $tan37° = \frac{3}{4}$)



A) $6.5\,kg$

B) $9\,kg$

C) $4.5\,kg$

D) $2.25\,kg$

Q.45 If the percentage errors in measuring the length and the diameter of a wire are 0.1% each. The percentage error in measuring its resistance will be

A) 0.2%

B) 0144%

C) 0.3%

D) 0.1%

46. The **correct** decreasing order of atomic radii (pm) of Li, Be, B and C is

(1) Be > Li > B > C

(2) Li > Be > B > C

(3) C > B > Be > Li

(4) Li > C > Be > B

47. Following data is for a reaction between reactants A and B :

Rate	[A]	[B]
mol L^{-1} s^{-1}		
2×10^{-3}	0.1 M	0.1 M
4×10^{-3}	0.2 M	0.1 M
1.6×10^{-2}	0.2 M	0.2 M

The order of the reaction with respect to A and B, respectively, are

(1) 1, 0

(2) 0, 1

(3) 1, 2

(4) 2, 1

48. Given below are two statements:

Statement I: Propene on treatment with diborane gives an addition product with the formula $((CH_3)_2 - CH\rightarrow_3 B$.

Statement II: Oxidation of $((CH_3)_2 - CH\rightarrow_3 B$ with hydrogen peroxide in presence of NaOH gives propan-2-ol.

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

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

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

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

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

49. Baeyer's reagent is :

(1) Acidic potassium permanganate solution

(2) Acidic potassium dichromate solution

(3) Cold, dilute, aqueous solution of potassium permanganate

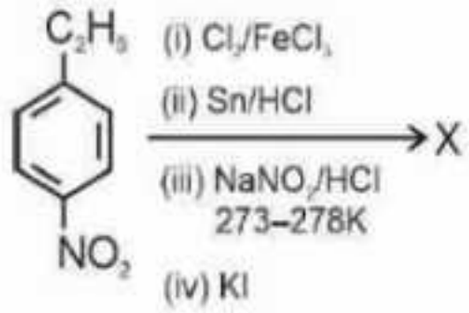
(4) Hot, concentrated solution of potassium permanganate

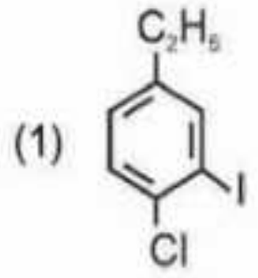
50. Which of the following molecules has "NON ZERO" dipole moment value?

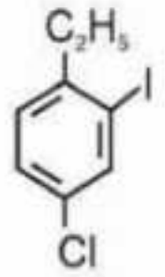
(1) CCl_4 (2) HI

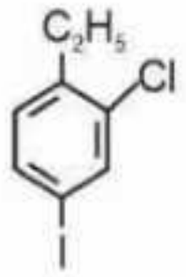
(3) CO_2 (4) BF_3

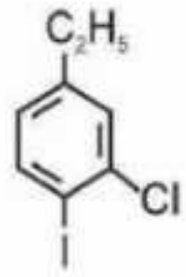
51. The major product X formed in the following reaction sequence is:



(1) 

(2) 

(3) 

(4) 

52. Which indicator is used in the titration of sodium hydroxide against oxalic acid and what is the colour change at the end point?

(1) Phenolphthalein, pink to yellow

(2) Alkaline $KMnO_4$, colourless to pink

(3) Phenolphthalein, colourless to pink

(4) Methyl orange, yellow to pinkish red colour

53. Match List-I with List-II :

	List-I (Atom/Molecule)		**List-II (Property)**
A.	Nitrogen atom	I.	Paramagnetic
B.	Fluorine molecule	II.	Most reactive element in group 18
C.	Oxygen molecule	III.	Element with highest ionisation enthalpy in group 15
D.	Xenon atom	IV.	Strongest oxidising agent

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

(1) A-III, B-I, C-IV, D-II (2) A-I, B-IV, C-III, D-II

(3) A-II, B-IV, C-I, D-III (4) A-III, B-IV, C-I, D-II

54. From the following select the one which is **not** an example of corrosion.

(1) Rusting of iron object

(2) Production of hydrogen by electrolysis of water

(3) Tarnishing of silver

(4) Development of green coating on copper and bronze ornaments

55. Which of the following pairs of ions will have same spin only magnetic moment values within the pair?

A. Zn^{2+}, Ti^{2+}

B. Cr^{2+}, Fe^{2+}

C. Ti^{3+}, Cu^{2+}

D. V^{2+}, Cu^{+}

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

(1) C and D only

(2) A and D only

(3) A and B only

(4) B and C only

56. At a given temperature and pressure, the equilibrium constant values for the equilibria are given below:

$3A_2 + B_2 \rightleftharpoons 2A_3B$, K_1

$A_3B \rightleftharpoons \frac{3}{2}A_2 + \frac{1}{2}B_2$, K_2

The relation between K_1 and K_2 is :

(1) $K_1^2 = 2K_2$

(2) $K_2 = \frac{K_1}{2}$

(3) $K_1 = \frac{1}{\sqrt{K_2}}$

(4) $K_2 = \frac{1}{\sqrt{K_1}}$

57. Arrange the following compounds in increasing order of their solubilities in chloroform:

NaCl, CH_3OH, cyclohexane, CH_3CN

(1) NaCl < CH_3CN < CH_3OH < Cyclohexane

(2) CH_3OH < CH_3CN < NaCl < Cyclohexane

(3) NaCl < CH_3OH < CH_3CN < Cyclohexane

(4) Cyclohexane < CH_3CN < CH_3OH < NaCl

58. Identify the **incorrect** statement about PCl_5.

(1) PCl_5 possesses two different Cl – P – Cl bond angles

(2) All five P – Cl bonds are identical in length

(3) PCl_5 exhibits sp^3d hybridisation

(4) PCl_5 consists of five P – Cl (sigma) bonds

59. Choose the correct statement for the work done in the expansion and heat absorbed or released when 5 litres of an ideal gas at 10 atmospheric pressure isothermally expands into vacuum until volume is 15 litres :

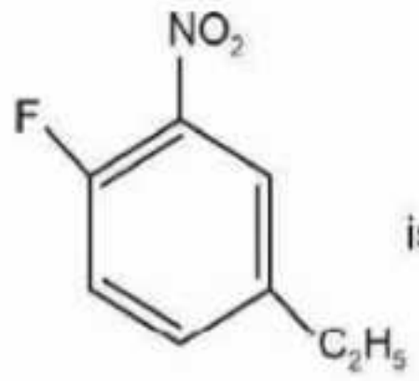
(1) Both the heat and work done will be greater than zero

(2) Heat absorbed will be less than zero and work done will be positive

(3) Work done will be zero and heat will also be zero

(4) Work done will be greater than zero and heat will remain zero

60. The correct IUPAC name of the compound



is:

(1) 4-ethyl-1-fluoro-2-nitrobenzene

(2) 4-ethyl-1-fluoro-6-nitrobenzene

(3) 3-ethyl-6-fluoro-1-nitrobenzene

(4) 1-ethyl-4-fluoro-3-nitrobenzene

61. Which of the following set of ions act as oxidising agents?

(1) Ce^{4+} and Tb^{4+}

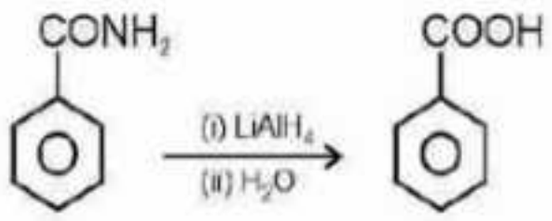
(2) La^{3+} and Lu^{3+}

(3) Eu^{2+} and Yb^{2+}

(4) Eu^{2+} and Tb^{4+}

62. Select the **incorrect** reaction among the following:

(1) $CH_3COCl \xrightarrow[\Delta]{H_2O} CH_3COOH$

(2) 

(3) $CH_3CH_2OH \xrightarrow[(ii)\,H_3O^{\oplus}]{(i)\,KMnO_4/OH^-} CH_3COOH$

(4) $CH_3CH_2CH_2OH \xrightarrow{CrO_3-H_2SO_4} CH_3CH_2COOH$

63. The UV-visible absorption bands in the spectra of lanthanoid ions are 'X', probably because of the excitation of electrons involving 'Y'. The 'X' and 'Y', respectively, are :

(1) Broad and f orbitals

(2) Narrow and f orbitals

(3) Broad and d and f orbitals

(4) Narrow and d and f orbitals

64. Ethylene diaminetetraacetate ion is a/an:

(1) hexadentate ligand
(2) ambidentate ligand
(3) monodentate ligand
(4) bidentate ligand

65. The amount of glucose required to prepare 250 mL of $\frac{M}{20}$ aqueous solution is :

(Molar mass of glucose : 180 g mol^{-1})

(1) 2.25 g
(2) 4.5 g
(3) 0.44 g
(4) 1.125 g

66. Identify the **incorrect** statement from the following :

(1) The acidic strength of HX (X = F, Cl, Br and I) follows the order : HF > HCl > HBr > HI.
(2) Fluorine exhibits –1 oxidation state whereas other halogens exhibit +1, +3, +5 and +7 oxidation states also.
(3) The enthalpy of dissociation of F_2 is smaller than that of Cl_2.
(4) Fluorine is stronger oxidising agent than chlorine.

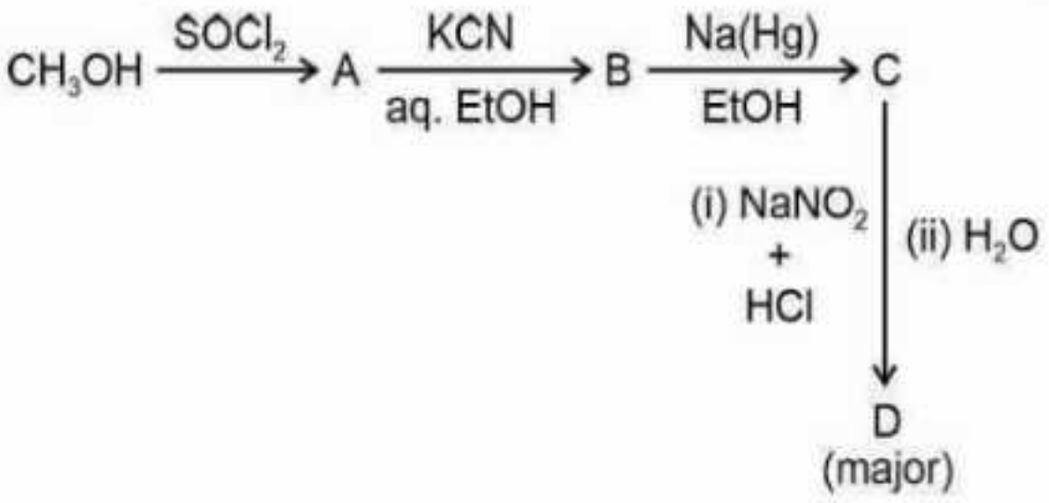
67. For the reaction in equilibrium

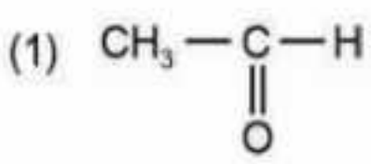
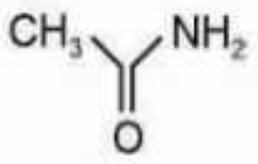
$N_2(g) + 3H_2(g) \rightleftharpoons 2NH_3(g)$, $\Delta H = -Q$

Reaction is favoured in forward direction by:

(1) use of catalyst
(2) decreasing concentration of N_2
(3) low pressure, high temperature and high concentration of ammonia
(4) high pressure, low temperature and higher concentration of H_2

68. The major product D formed in the following reaction sequence is:



(1) 
(2) 
(3) CH_3CH_2OH
(4) CH_3CH_2Cl

69. Match List-I with List-II:

	List-I (Block/group in periodic table)		List-II (Element)
A.	Lanthanoid	I.	Ce
B.	d-block element	II.	As
C.	p-block element	III.	Cs
D.	s-block element	IV.	Mn

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

(1) A-I, B-II, C-IV, D-III

(2) A-I, B-IV, C-III, D-II

(3) A-I, B-IV, C-II, D-III

(4) A-IV, B-I, C-II, D-III

70. Which of the following is **not** an ambidentate ligand?

(1) $C_2O_4^{2-}$

(2) SCN^-

(3) NO_2^-

(4) CN^-

71. The quantum numbers of four electrons are given below :

I. $n = 4; l = 2; m_l = -2; s = -\frac{1}{2}$

II. $n = 3; l = 2; m_l = 1; s = +\frac{1}{2}$

III. $n = 4; l = 1; m_l = 0; s = +\frac{1}{2}$

IV. $n = 3; l = 1; m_l = -1; s = +\frac{1}{2}$

The **correct** decreasing order of energy of these electrons is

(1) IV > II > III > I

(2) I > III > II > IV

(3) III > I > II > IV

(4) I > II > III > IV

72. The major product C in the below mentioned reaction is:

$$CH_3CH_2CH_2Br \xrightarrow[\Delta]{\text{alc. KOH}} A \xrightarrow{HBr} B \xrightarrow[\Delta]{\text{aq. KOH}} C$$

(1) Propan-1-ol

(2) Propan-2-ol

(3) Propane

(4) Propyne

73. The compound that does not undergo Friedel-Crafts alkylation reaction but gives a positive carbylamine test is :

(1) Aniline
(2) Pyridine
(3) N-methylaniline
(4) Triethylamine

74. For an endothermic reaction:

(A) q_p is negative.
(B) $\Delta_r H$ is positive.
(C) $\Delta_r H$ is negative.
(D) q_p is positive.

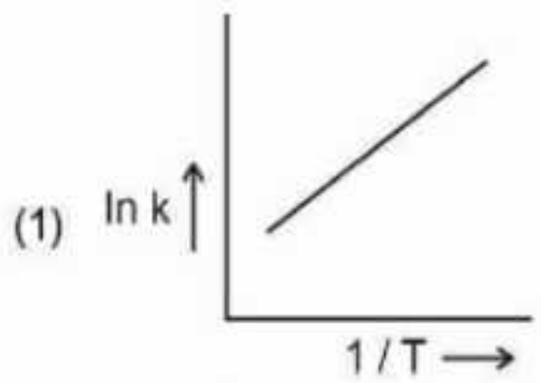
Choose the **correct** answer from the options given, below:

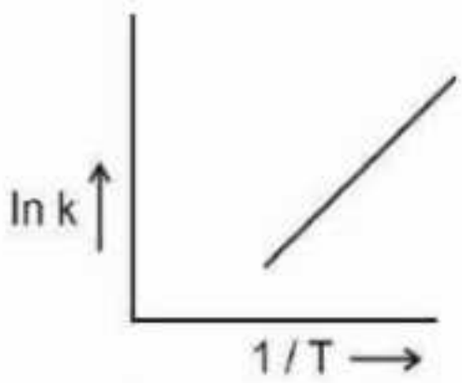
(1) B and D
(2) C and D
(3) A and B
(4) A and C

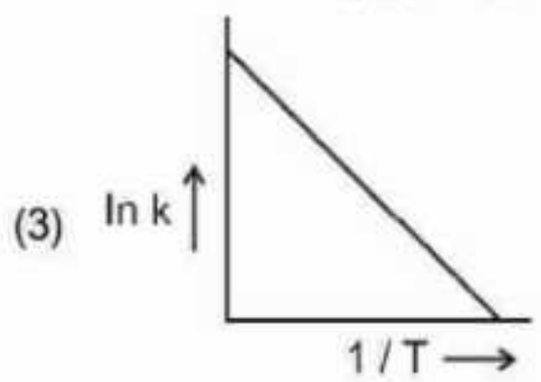
75. 1.0 g of H_2 has same number of molecules as in:

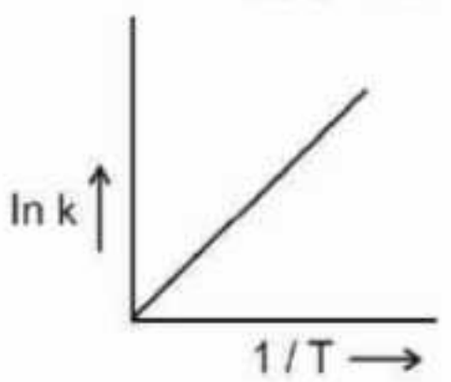
(1) 14 g of N_2
(2) 18 g of H_2O
(3) 16 g of CO
(4) 28 g of N_2

76. Which of the following plot represents the variation of ln k versus $\frac{1}{T}$ in accordance with Arrhenius equation?

(1) 

(2) 

(3) 

(4) 

77. A steam volatile organic compound which is immiscible with water has a boiling point of 250°C. During steam distillation, a mixture of this organic compound and water will boil :

(1) above 100°C but below 250°C
(2) above 250°C
(3) at 250°C
(4) close to but below 100°C

78. Given below are two statements :

Statement I : Glycogen is similar to amylose in its structure.

Statement II : Glycogen is found in yeast and fungi also.

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

(1) **Statement I** is true but **Statement II** is false.

(2) **Statement I** is false but **Statement II** is true.

(3) Both **Statement I** and **Statement II** are true.

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

79. The oxidation states **not** shown by Mn in given reaction is :

$$3MnO_4^{2-} + 4H^+ \longrightarrow 2MnO_4^- + MnO_2 + 2H_2O$$

A. +6

B. +2

C. +4

D. +7

E. +3

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

(1) D and E only

(2) B and D only

(3) A and B only

(4) B and E only

80. Given below are two statements:

Statement I: The Balmer spectral line for H atom with lowest energy is located at $\frac{5}{36}R_H\ cm^{-1}$.

(R_H = Rydberg constant)

Statement II: When the temperature of blackbody increases, the maxima of the curve (intensity of wavelength) shifts to shorter wavelength.

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

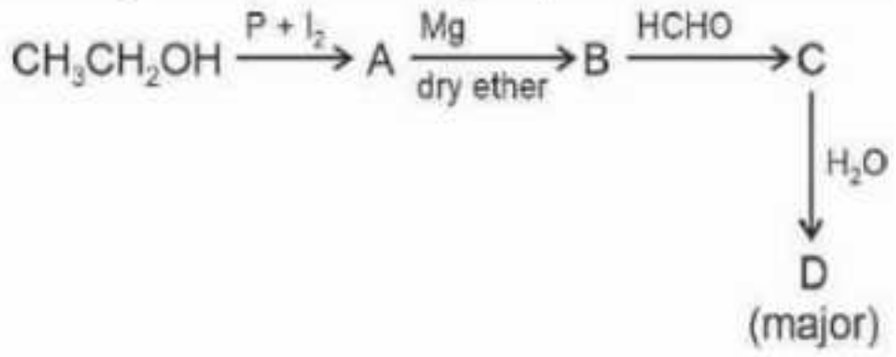
(1) **Statement I** is true but **Statement II** is false

(2) **Statement I** is false but **Statement II** is true

(3) Both **Statement I** and **Statement II** are true

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

81. Identify D in the following sequence of reactions:



(1) n-propyl alcohol
(2) isopropyl alcohol
(3) propanal
(4) propionic acid

82. Identify the **incorrect** statement.

(1) PEt_3 and $AsPh_3$ as ligands can form $d\pi$-$d\pi$ bond with transition metals
(2) The N – N single bond is as strong as the P – P single bond
(3) Nitrogen has unique ability to form $p\pi$-$p\pi$ multiple bonds with nitrogen, carbon and oxygen
(4) Nitrogen cannot form $d\pi$-$p\pi$ bond as other heavier elements of its group

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

	List-I (Test/reagent)		**List-II (Radical identified)**
A.	Lake Test	I.	NO_3^-
B.	Nessler's Reagent	II.	Fe^{3+}
C.	Potassium sulphocyanide	III.	Al^{3+}
D.	Brown Ring Test	IV.	NH_4^+

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

(1) A-IV, B-II, C-III, D-I
(2) A-II, B-IV, C-III, D-I
(3) A-II, B-III, C-IV, D-I
(4) A-III, B-IV, C-II, D-I

84. Match List-I with List-II:

	List-I Molecule		**List-II Bond enthalpy (kJ mol^{-1})**
A.	HCl	I.	435.8
B.	N_2	II.	498
C.	H_2	III.	946.0
D.	O_2	IV.	431.0

Choose the correct answer from the options given below:

(1) A-III, B-IV, C-I, D-II
(2) A-IV, B-I, C-III, D-II
(3) A-IV, B-III, C-II, D-I
(4) A-IV, B-III, C-I, D-II

85. The standard cell potential of the following cell $Zn|Zn^{2+}(aq)|Fe^{2+}(aq)|Fe$ is 0.32 V. Calculate the standard Gibbs energy change for the reaction :

$Zn(s) + Fe^{2+}(aq) \rightarrow Zn^{2+}(aq) + Fe(s)$

(Given : 1 F = 96487 C)

(1) $-61.75\ kJ\ mol^{-1}$ (2) $+5.006\ kJ\ mol^{-1}$

(3) $-5.006\ kJ\ mol^{-1}$ (4) $+61.75\ kJ\ mol^{-1}$

86. Match List-I will List-II:

	List-I **Solid salt treated with dil. H_2SO_4**		**List-II** **Anion detected**
A.	effervescence of colourless gas	I.	NO_2^-
B.	gas with smell of rotten egg	II.	CO_3^{2-}
C.	gas with pungent smell	III.	S^{2-}
D.	brown fumes	IV.	SO_3^{2-}

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

(1) A-II, B-III, C-IV, D-I (2) A-IV, B-III, C-II, D-I

(3) A-I, B-II, C-III, D-IV (4) A-II, B-III, C-I, D-IV

87. The ratio of solubility of AgCl in 0.1 M KCl solution to the solubility of AgCl in water is:

(Given : Solubility product of AgCl = 10^{-10})

(1) 10^{-4} (2) 10^{-6}

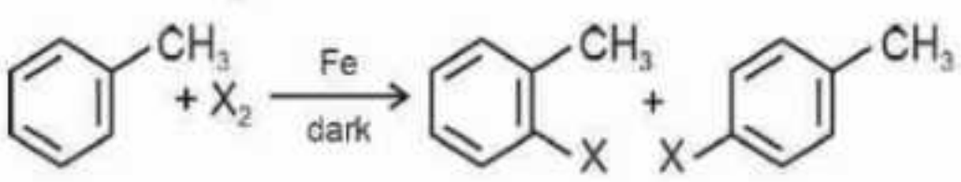
(3) 10^{-9} (4) 10^{-5}

88. On complete combustion, 0.3 g of an organic compound gave 0.2 g of CO_2 and 0.1 g of H_2O. The percentage composition of carbon and hydrogen in the compound, respectively is:

(1) 4.07% and 15.02% (2) 18.18% and 3.70%

(3) 15.02% and 4.07% (4) 3.70% and 18.18%

89. The following reaction method

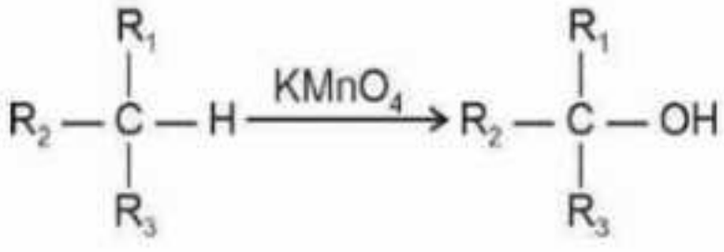


is not suitable for the preparation of the corresponding haloarene products, due to high reactivity of halogen, when X is :

(1) F (2) I

(3) Cl (4) Br

90. The alkane that can be oxidized to the corresponding alcohol by $KMnO_4$ as per the equation



is, when:

(1) $R_1 = H; R_2 = H; R_3 = H$

(2) $R_1 = CH_3; R_2 = CH_3; R_3 = CH_3$

(3) $R_1 = CH_3; R_2 = H; R_3 = H$

(4) $R_1 = CH_3; R_2 = CH_3; R_3 = H$

ANSWER KEY

Q.NO	PHYSICS	Q.NO	CHEMISTRY
1	A	46	B
2	A	47	C
3	A	48	B
4	A	49	C
5	B	50	B
6	C	51	C
7	A	52	C
8	D	53	D
9	C	54	B
10	B	55	D
11	C	56	D
12	B	57	A
13	A	58	B
14	A	59	C
15	C	60	A
16	C	61	A
17	B	62	B
18	A	63	B
19	A	64	A
20	D	65	A
21	D	66	A
22	D	67	D
23	A	68	C
24	A	69	C
25	D	70	A
26	A	71	B
27	C	72	B
28	C	73	A
29	D	74	A
30	D	75	A
31	B	76	C
32	A	77	D
33	C	78	B
34	D	79	D
35	B	80	C
36	D	81	A
37	D	82	B
38	B	83	D
39	D	84	D
40	C	85	A
41	C	86	A
42	A	87	A
43	A	88	B
44	C	89	A
45	C	90	B

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