All India Institute of Speech and Hearing

Notations :

1.Options shown in green color and with ✔ icon are correct.

2.Options shown in red color and with ✖ icon are incorrect.

Question Paper Name :	BASLP PCM 5th Oct 2020 Shift1
Subject Name :	BASLP - PCM
Creation Date :	2020-10-05 12:36:36
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Total Marks :	150
Display Marks:	No
Calculator :	None
Magnifying Glass Required? :	No
Ruler Required? :	No
Eraser Required? :	No
Scratch Pad Required? :	No
Rough Sketch/Notepad Required? :	No
Protractor Required? :	No
Show Watermark on Console? :	Yes
Highlighter :	No
Auto Save on Console? :	Yes

BASLP - PCM

Group Number :	1
Group Id :	23079618

Group Maximum Duration :	0
Group Minimum Duration :	150
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	150
Is this Group for Examiner? :	No

PHYSICS

Section Id :	23079636
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	50
Number of Questions to be attempted :	50
Section Marks :	50
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	23079636
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 2307962151 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Two objects X and Y are projected with the same speed so that the ratio of their maximum heights reached is 3:1. If the speed of X is tripled without changing other parameters, the ratio of the horizontal range attained by X and B is

Options :

1. ✖ 3:1

2. ✔ 9:1

3. ✖ 1:3

4. ✖ 1:9

Question Number : 2 Question Id : 2307962152 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If γ is the ratio of specific heats of a perfect gas, then the number of degree of freedom of a molecule of the gas is

Options :

1. ✔ $\frac{2}{\gamma-1}$

2. ✖ $\frac{\gamma-1}{2}$

3. ✖ $\frac{2y}{\gamma-1}$

4. ✖ $\frac{\gamma-1}{2y}$

Question Number : 3 Question Id : 2307962153 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In which process the internal energy of the system remains constant?

Options :

1. ✖ adiabatic

2. ✔ isothermal

3. ✖ isochoric

4. ✖ isobaric

Question Number : 4 Question Id : 2307962154 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

What is the ratio of the potential energy of a simple harmonic oscillator when the particle is at its endpoint to the particle is halfway to its endpoint?

Options :

1. ✖ 1:4

2. ✖ 2:1

3. ✔ 4:1

4. ✖ 1:2

Question Number : 5 Question Id : 2307962155 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

What are the number of nodes and antinodes when a sonometer is vibrating in its 2nd overtone?

Options :

1. ✖ 2,3

2. ✖ 3,2

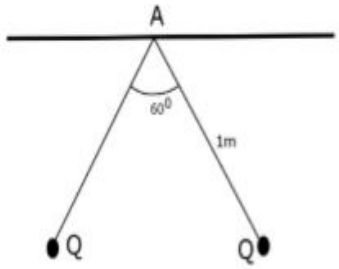
3. ✔ 4,3

4. ✖ 3,4

Question Number : 6 Question Id : 2307962156 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Two small spherical balls each carrying a charge Q= 20 μC are suspended by two insulated threads of equal length 1 m each, from a point from the rigid support. It is found that in equilibrium, the threads are separated by an angle 60^0 between them, as shown in the diagram. The tension in the thread is



Options :

1. ✔ 7.2 N

2. ✖ 3.6 N

3. ✖ 1.8 N

4. ✖ 14.4 N

Question Number : 7 Question Id : 2307962157 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A hollow metal sphere of radius 10 cm is charged such that the potential on its surface is 20 V. The electric field at the centre of the sphere will be

Options :

1. ✖ 20 V/m

2. ✖ 200 V/m

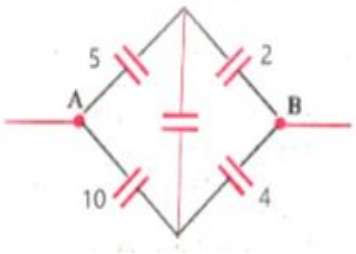
3. ✖ 10 V/m

4. ✔ zero

Question Number : 8 Question Id : 2307962158 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

What is the effective capacitance between A and B in the figure shown below?
(all capacitances in μF)



Options :

1. ✖ $\frac{21}{20}$ μF

2. ✔ $\frac{30}{7}$ μF

3. ✖ $\frac{20}{21}$ μF

4. ✖ $\frac{7}{20}$ μF

Question Number : 9 Question Id : 2307962159 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following are not electromagnetic waves?

Options :

1. ✖ UV-rays

2. ✔ β-rays

3. ✖ gamma-rays

4. ✖ x-rays

Question Number : 10 Question Id : 2307962160 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The electric field associated with an e.m. wave in vacuum is $\vec{E} = \hat{\imath}\,20\cos(kz - 3\times10^{8}\,t)$. The value of k is

Options :

1. ✖ $2\ m^{-1}$

2. ✖ $3\ m^{-1}$

3. ✔ $1\ m^{-1}$

4. ✖ $20\ m^{-1}$

Question Number : 11 Question Id : 2307962161 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In Young's double-slit experiment, the fringe width is 1.33 mm. If the entire arrangement is placed in water (refractive index=1.33). What is the width of the new fringe?

Options :

1. ✖ 1.77 mm

2. ✖ 0.57 mm

3. ✖ 4.03 mm

4. ✔ 1 mm

Question Number : 12 Question Id : 2307962162 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Light of wavelength 500 nm is incident on a slit of width 0.5 mm. The width of the central bright

line on the screen is 1 cm. What is the distance of the screen?

Options :

1. ✔ 5 m

2. ✖ 10 m

3. ✖ 2.5 m

4. ✖ 50 m

Question Number : 13 Question Id : 2307962163 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

What is the minimum length of the mirror required to visualize the complete image of the body of a person of height 'x'?

Options :

1. ✖ x/4

2. ✖ 2x

3. ✖ x

4. ✔ x/2

Question Number : 14 Question Id : 2307962164 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The diameter of a plano-convex lens is 8 cm and thickness at the centre is 4 mm. If the speed of light in the material of the lens is 1.5×10^8 m/s the focal length of the lens is

Options :

1. ✔ 20 cm

2. ✖ 30 cm

3. ✖ 40 cm

4. ✖ 60 cm

Question Number : 15 Question Id : 2307962165 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The ratio of shortest wavelength to longest wavelength in Lyman series hydrogen spectra is

Options :

1. ✖ $\frac{9}{4}$

2. ✖ $\frac{11}{4}$

3. ✖ $\frac{1}{4}$

4. ✔ $\frac{4}{3}$

Question Number : 16 Question Id : 2307962166 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Two nuclei have their mass number in ratio of 1:5. The ratio of their nuclear densities would be

Options :

1. ✖ 1:5

2. ✖ 5:1

3. ✔ 1:1

4. ✖ 1:25

Question Number : 17 Question Id : 2307962167 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A uniform rope of mass 0.1 kg and length 2.45 m hangs from a rigid support. The time taken by

the transverse wave formed in the rope to travel through the full length of the rope is

Options :

1. ✖ 0.5 s

2. ✖ 1.6 s

3. ✖ 1.2 s

4. ✔ 1 s

Question Number : 18 Question Id : 2307962168 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The polariser and analyser are inclined to each other at $60°$. If $\frac{I}{2}$ is the intensity of the polarised light emergent from analyser, then the intensity of the unpolarised light incident on the polariser is

Options :

1. ✖ 8I

2. ✔ 4I

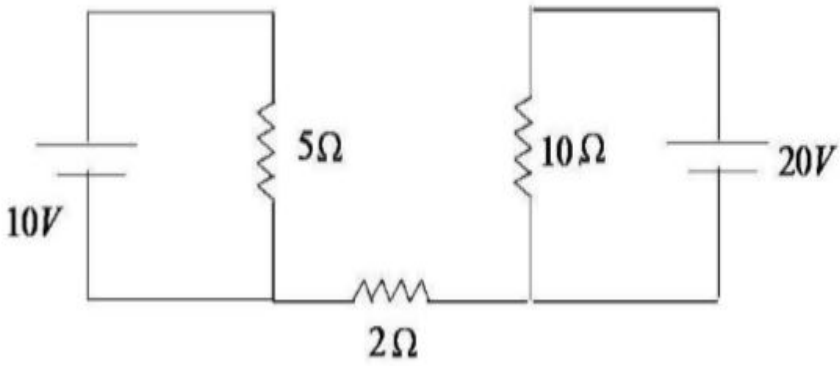
3. ✖ 2I

4. ✖ I

Question Number : 19 Question Id : 2307962169 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Find out the value of current through 2Ω resistance for the given circuit



Options :

1. ✔ 0

2. ✖ 4A

3. ✖ 5A

4. ✖ 1A

Question Number : 20 Question Id : 2307962170 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The resistances of the four arms P,Q,R and S in a Wheatstone's bridge are 10 ohm, 30 ohm, 30 ohm and 90 ohm, respectively. The e.m.f and internal resistance of the cell are 7 volt and 5 ohm respectively. If the galvanometer resistance is 50 ohm, the current drawn from the cell will be

Options :

1. ✖ 1.0A

2. ✔ 0.2A

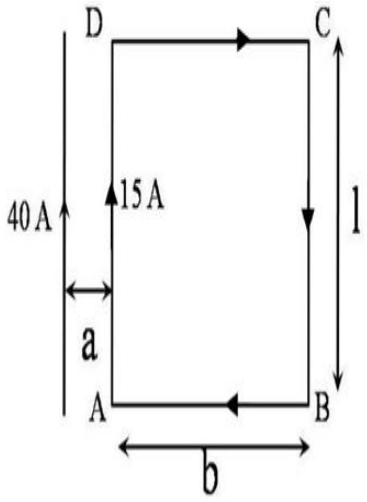
3. ✖ 0.1A

4. ✖ 2.0 A

Question Number : 21 Question Id : 2307962171 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A long wire carrying a current of 40A as shown in figure. The rectangular loop carries a current of 15A. The resultant force acting on the loop is [assume that $a = 1cm, b = 80cm$ and $1 = 30cm$]



Options :

1. ✔ 3.6×10^{-3} N directed towards wire

2. ✖ 3.6×10^{-3} N directed away from wire

3. ✖ 6.4×10^{-3} N directed towards wire

4. ✖ 6.4×10^{-3} N directed away from wire

Question Number : 22 Question Id : 2307962172 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A compass needle makes 10 oscillations per minute in the earths horizontal field. A bar magnet deflects the needle by $60°$ from the magnetic meridian. The frequency of oscillation in the deflected position in oscillations per minute is (field due to magnet is perpendicular to B_H)

Options :

1. ✖ $5\sqrt{2}$

2. ✖ $20\sqrt{2}$

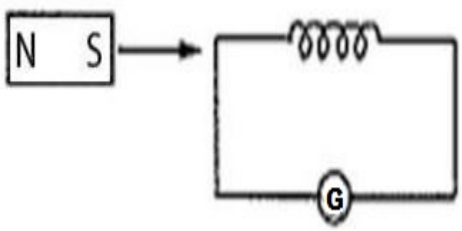
3. ✔ $10\sqrt{2}$

4. ✖ 10

Question Number : 23 Question Id : 2307962173 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

As shown in the figure, a magnet is moved with some speed towards a coil at rest. Due to this induced electromotive force, induced current and induced charge in the coil are E, I and Q respectively. If the speed of the magnet is doubled, the incorrect statement is



Options :

1. ✖ E increases

2. ✖ I increases

3. ✖ Q remains same

4. ✔ Q increases

Question Number : 24 Question Id : 2307962174 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Power dissipated in an L-C-R series circuit connected to an AC source of emf E is

Options :

1. ✔ $$\mathbf{P} = \frac{E^2}{\left[\sqrt{R^2 + \left[\omega L - \frac{1}{\omega C}\right]^2}\right]^2} X R$$

2. ✖ $$P = \frac{E^2}{R}$$

3. ✖ $$P = \frac{E^2}{(X_L - X_C)}$$

4. ✖ $$P = (X_L - X_C)\frac{E^2}{R}$$

Question Number : 25 Question Id : 2307962175 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

An electron (mass m) with an initial velocity $V = V_0 \hat{i}$ is in an electric field $E = E_0 \hat{j}$ If $\lambda_0 = \frac{\lambda}{mv_0}$, its debroglie wave length at time t is given by

Options :

1. ✖ $\lambda_0 \sqrt{1 + \frac{e^2 E_0^2 t^2}{m^2 v_0^2}}$

2. ✔ $\frac{\lambda_0}{\sqrt{1 + \frac{e^2 E_0^2 t^2}{m^2 v_0^2}}}$

3. ✖ $\frac{\lambda_0}{\left(1 + \frac{e^2 E_0^2 t^2}{m^2 v_0^2}\right)}$

4. ✖ λ_0

Question Number : 26 Question Id : 2307962176 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In which of the following process the number of protons in the nucleus increases?

Options :

1. ✖ $\alpha - decay$

2. ✔ $\beta^- - decay$

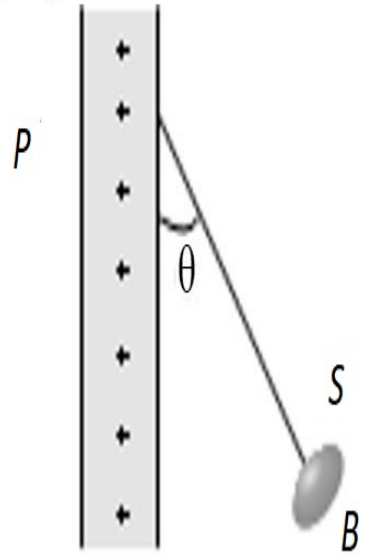
3. ✖ $\beta^+ - decay$

4. ✖ $\mathrm{k} - capture$

Question Number : 27 Question Id : 2307962177 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A charged ball B hangs from a silk thread S, which makes an angle θ with a large charged conducting sheet P, as shown in the figure. The surface charge density σ of the sheet is proportional to



Options :

1. ✖ $\sin\theta$

2. ✔ $\tan\theta$

3. ✖ $\cos\theta$

4. ✖ $\cot\theta$

Question Number : 28 Question Id : 2307962178 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Eight drops of mercury of equal radii possessing equal charges combine to form a big drop. Then the capacitance of bigger drop compared to each individual small drop is

Options :

1. ✖ 8 times

2. ✖ 4 times

3. ✔ 2 times

4. ✖ 32 times

Question Number : 29 Question Id : 2307962179 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The velocity v (in cm/s) of a particle is given in terms of time t (in $second$) by the relation $v = at + \frac{b}{t+c}$; the dimensions of a, b and c are

Options :

1. ✖ $a = L^2, b = T, c = LT^2$

2. ✖ $a = LT^2, b = LT, c = L$

3. ✔ $a = LT^{-2}, b = L, c = T$

4. ✖ $a = L, b = LT, c = T^2$

Question Number : 30 Question Id : 2307962180 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

While measuring the acceleration due to gravity by a simple pendulum, a student makes a positive error of 1% in the length of the pendulum and a negative error of 3% in the value of time period. His percentage error in the measurement of g by the relation $g = 4\pi^2\left(l/T^2\right)$ will be

Options :

1. ✖ 2%

2. ✖ 4%

3. ✔ 7%

4. ✖ 10%

Question Number : 31 Question Id : 2307962181 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A body starts with an initial velocity of $10ms^{-1}$ and is moving along a straight line with constant acceleration. When the velocity of the particle is $50ms^{-1}$, the acceleration is reversed in direction. The speed of the particle when it again reaches the starting point is

Options :

1. ✔ $70ms^{-1}$

2. ✖ $60ms^{-1}$

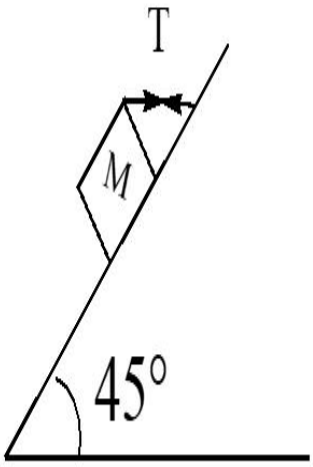
3. ✖ $10ms^{-1}$

4. ✖ $50ms^{-1}$

Question Number : 32 Question Id : 2307962182 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A block of mass 15 kg is resting on a rough inclined plane as shown in fig. The block is tied by a horizontal string which has a tension of 50 N. The coefficient of friction between the surfaces of contact is



Options :

1. ✔ 1/2

2. ✖ 2/3

3. ✖ 3/4

4. ✖ 1/4

Question Number : 33 Question Id : 2307962183 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A 2 kg brick of dimension 5 cmx2.5 cmx1.5 cm is lying on the largest base. It is now made to stand with length vertical, then the amount of work done is

Options :

1. ✔ 0.35 J

2. ✖ 5 J

3. ✖ 24 J

4. ✖ 288 J

Question Number : 34 Question Id : 2307962184 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A stationary wheel starts rotating about its own axis at constant angular acceleration. If the wheel completes 50 rotations in first 2 seconds, then the number of rotations made by it in next two seconds is

Options :

1. ✖ 75

2. ✖ 100

3. ✖ 125

4. ✔ 150

Question Number : 35 Question Id : 2307962185 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

To a person, going eastward in a car with a velocity of 25 km/hr, a train appears to move towards north with a velocity of $25\sqrt{3}$ km/hr. The actual velocity of the train will be

Options :

1. ✔ $25\ km/hr$

2. ✖ $50\ km/hr$

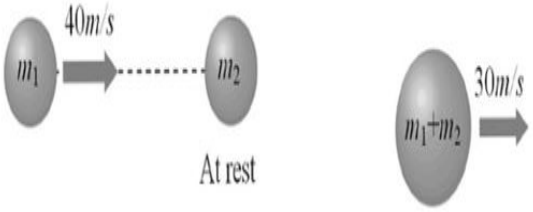
3. ✖ $5\ km/hr$

4. ✖ $5\sqrt{3}\ km/hr$

Question Number : 36 Question Id : 2307962186 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A body of mass m_1 moving with uniform velocity of 40 m/s collides with another mass m_2 at rest and then the two together begin to move with uniform velocity of 30 m/s. The ratio of their masses $\frac{m_1}{m_2}$ is



Options :

1. ✖ 0.75

2. ✖ 1.33

3. ✔ 3

4. ✖ 4

Question Number : 37 Question Id : 2307962187 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A body of mass m accelerates uniformly from rest to v_1 in time t_1. As a function of time t, the instantaneous power delivered to the body is

Options :

1. ✖ $\frac{mv_1 t}{t_1}$

2. ✖ $\frac{mv_1^2 t}{t_1}$

3. ✖ $\frac{mv_1 t^2}{t_1}$

4. ✔ $\frac{mv_1^2 t}{t_1^2}$

Question Number : 38 Question Id : 2307962188 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If a planet consists of a satellite whose mass and radius were both half that of the earth, the acceleration due to gravity at its surface would be

(g on earth = 9.8 m/sec^2)

Options :

1. ✖ $4.9\,m/s^2$

2. ✖ $8.9\,m/s^2$

3. ✔ $19.6\,m/s^2$

4. ✖ $29.4\,m/s^2$

Question Number : 39 Question Id : 2307962189 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Two wires A and B of same length, same area of cross-section having the same Young's modulus are heated to the same range of temperature. If the coefficient of linear expansion of A is 3/2 times of that of wire B. The ratio of the forces produced in two wires will be

Options :

1. ✖ 2/3

2. ✖ 9/4

3. ✖ 4/9

4. ✔ 3/2

Question Number : 40 Question Id : 2307962190 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If the work done in blowing a bubble of volume V is W, then the work done in blowing the bubble of volume 2V from the same soap solution will be

Options :

1. ✖ $W/2$

2. ✖ $\sqrt{2}\,W$

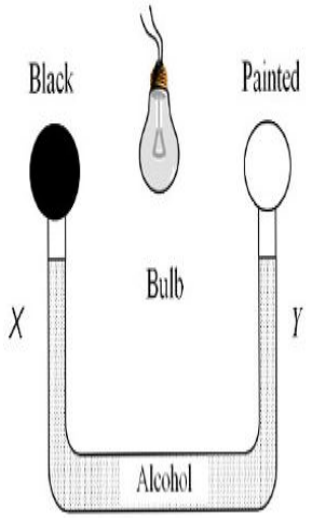
3. ✖ $\sqrt[3]{2}\,W$

4. ✔ $\sqrt[3]{4}\,W$

Question Number : 41 Question Id : 2307962191 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The following figure shows two air-filled bulbs connected by a U-tube partly filled with alcohol. What happens to the levels of alcohol in the limbs *X* and *Y* when an electric bulb placed midway between the bulbs is lighted



Options :

1. ✔ The level of alcohol in limb X falls while that in limb Y rises
2. ✖ The level of alcohol in limb X rises while that in limb Y falls
3. ✖ The level of alcohol falls in both limbs
4. ✖ There is no change in the levels of alcohol in the two limbs

Question Number : 42 Question Id : 2307962192 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A person is spinning with his hands outstretched at the rate of 4 $rads^{-1}$ .When he brings his hands close to the body, he spins at the rate of 16 $rads^{-1}$.
The ratio of M.I in the two cases successively is

Options :

1. ✔ 4:1

2. ✖ 1:14

3. ✖ 16:1

4. ✖ 2:1

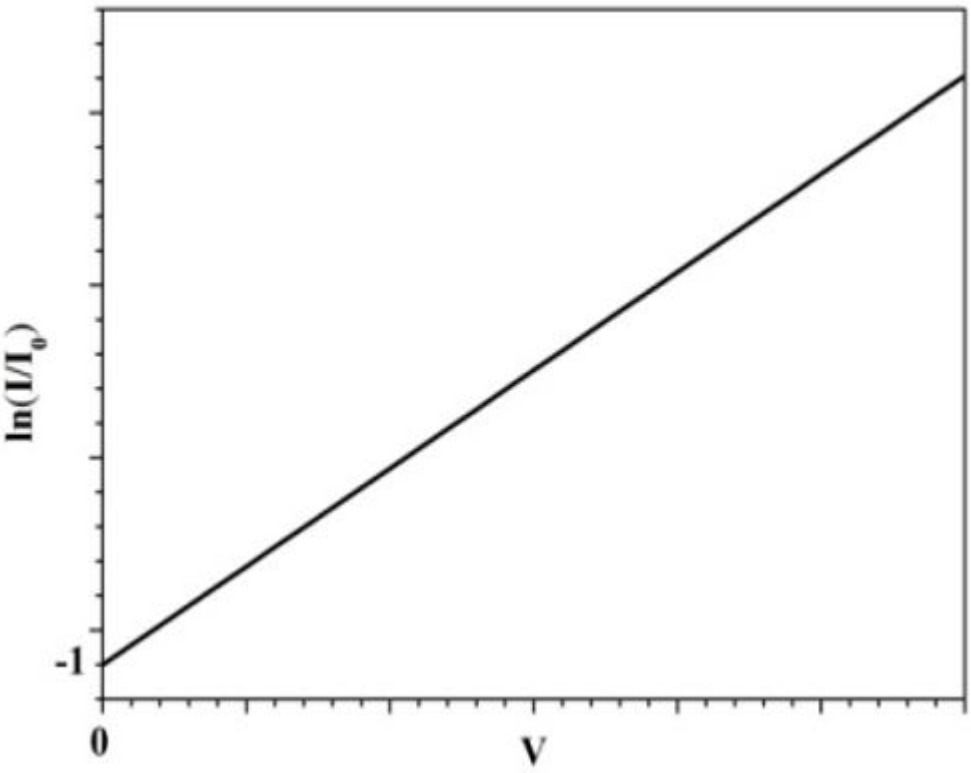
Question Number : 43 Question Id : 2307962193 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

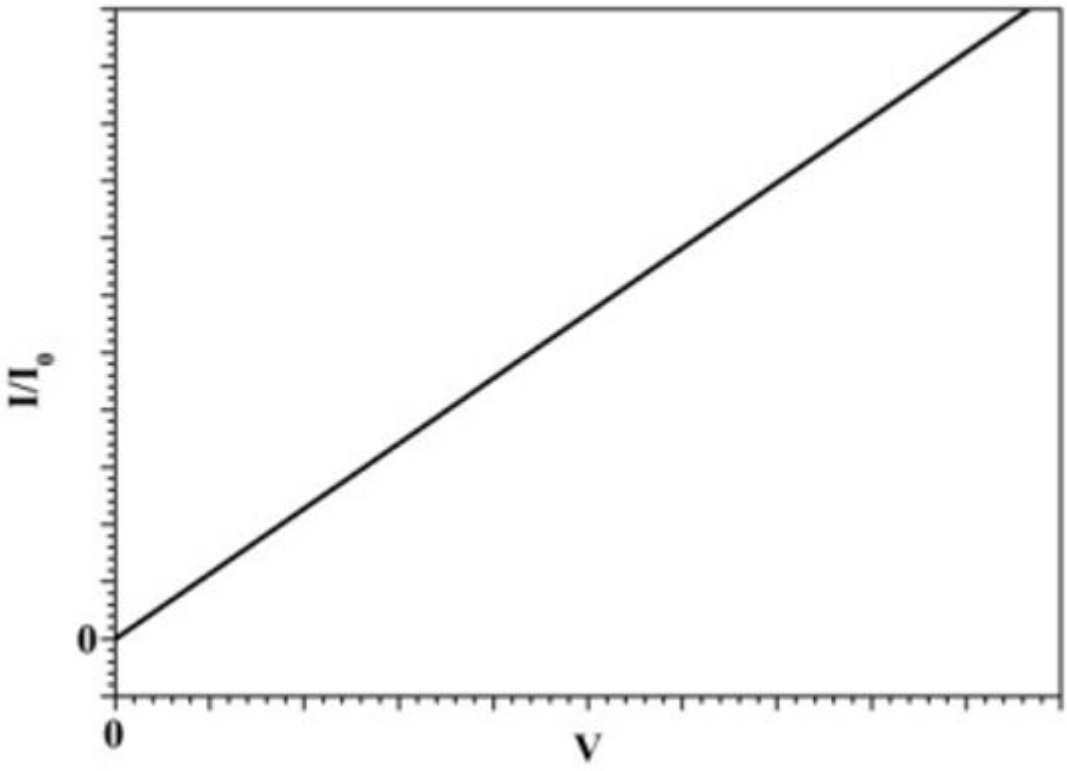
In a pn junction diode, the diode current I (i.e. the current through the diode) can be expressed as $I = I_0 \exp\left(\frac{eV}{kT} - 1\right)$ where I_0 is the reverse saturation current., V is the voltage across the diode and is positive for positive bias and negative for reverse bias, k is the Boltzmann constant= 1.38 x 10^{-23} J/K, and T is the absolute temperature. Then, which of the following is correct for a forward biased diode?

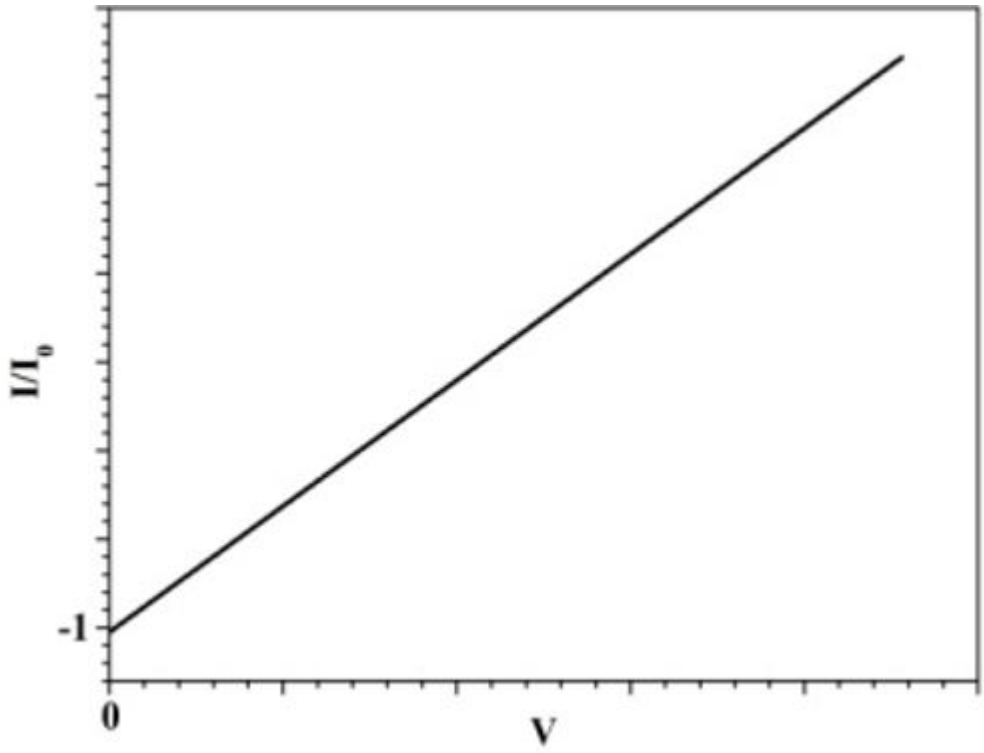
Options :

1. ✔



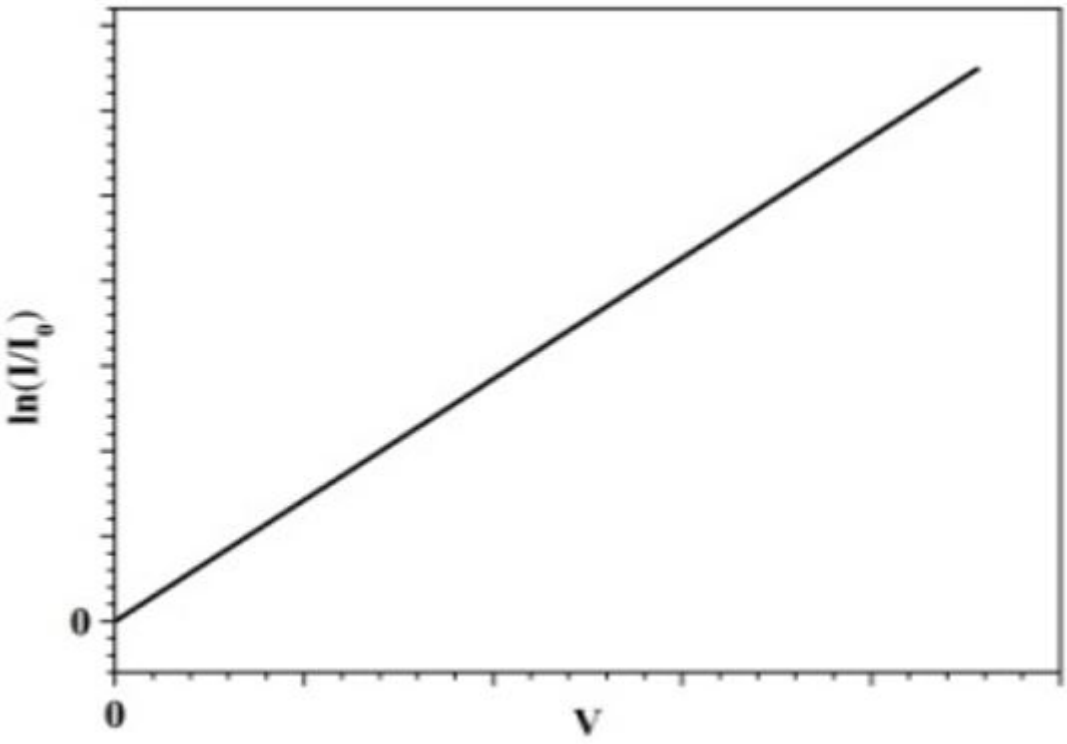
2. ✖





3. ✖

4. ✖



Question Number : 44 Question Id : 2307962194 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A square frame of edge 10 cm is placed with its positive normal making an angle of 60^0 with a uniform electric field of 10 V/m. Find the flux of the electric field through the surface bounded by the frame.

Options :

1. ✖ 0.1 V m

2. ✔ 0.05 V m

3. ✖ 0.01 V m

4. ✖ 0.5 V m

Question Number : 45 Question Id : 2307962195 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Two towers on the top of two hills are d m apart. The line joining them passes h m above a hill halfway between the towers. What is the longest wavelength of radio waves, which can be sent

between the towers without appreciable diffraction effects?

Options :

1. $h \times \sin\left(\tan^{-1}\left(\frac{h}{d}\right)\right)$ ✖

2. $h \times \tan\left(\sin^{-1}\left(\frac{2h}{d}\right)\right)$ ✖

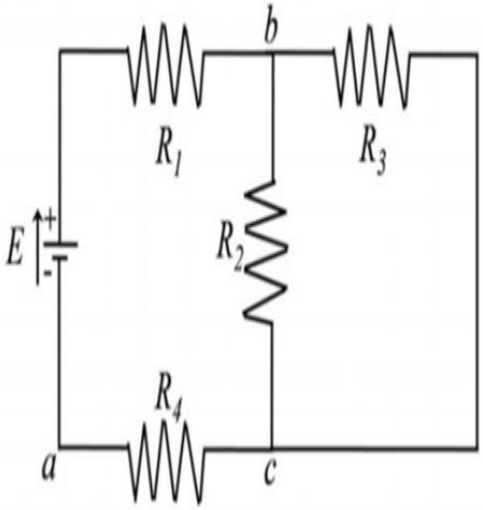
3. $h \times \tan\left(\sin^{-1}\left(\frac{h}{d}\right)\right)$ ✖

4. $h \times \sin\left(\tan^{-1}\left(\frac{2h}{d}\right)\right)$ ✔

Question Number : 46 Question Id : 2307962196 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The figure below shows a multiloop circuit containing one ideal battery and four resistances R_1= 20 Ω, R_2= 20 Ω, R_3= 30 Ω, and R_4= 8.0 Ω. E= 12 V. What is the current through the battery?



Options :

1. ✔ 0.30 A

2. ✖ 0.15 A

3. ✖ 0.2 A

4. ✖ 0.6 A

Question Number : 47 Question Id : 2307962197 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

An ammeter is to be constructed which can read currents up to 1.001 A. If the coil has resistance of 50 Ω and takes 1 mA for full scale deflection, what should be the resistance of the shunt used?

Options :

1. ✖ 0.1 Ω

2. ✖ 0.02 Ω

3. ✔ 0.05 Ω

4. ✖ $2.0\ \Omega$

Question Number : 48 Question Id : 2307962198 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The atomic masses (approximately) of Beryllium and Germanium are 9 and 72, respectively. The ratio of atomic radii of Beryllium and Germanium is,

Options :

1. ✔ 1 : 2

2. ✖ 2 : 1

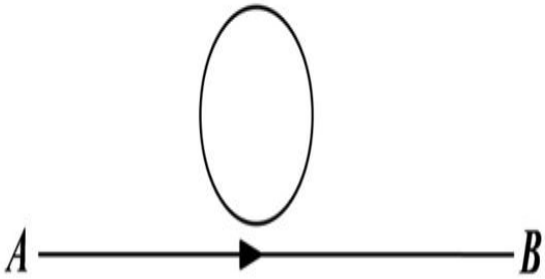
3. ✖ 1 : 4

4. ✖ 4 : 1

Question Number : 49 Question Id : 2307962199 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A current $I = I_0 t$ ampere flows from A to B, where I_0 is a constant and t is the time in seconds after switching on the circuit. What is the direction of induced current, if any, in the loop of the wire shown in the figure below?



Options :

1. ✔ clockwise

2. ✖ anticlockwise

3. ✖ no current is induced in the loop

4. ✖ the direction of the induced current changes with time

Question Number : 50 Question Id : 2307962200 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A resistor, an inductor, and a capacitor are connected in series to an a.c. power supply. When measured, the a. c. voltages across them are found to be 80 V, 30 V, and 90 V, respectively. What is the supply voltage?

Options :

1. ✖ $200\ \text{V}$

2. ✔ $100\ \text{V}$

3. ✖ $\frac{200}{\sqrt{2}}\ \text{V}$

4. ✖ $140\ \text{V}$

CHEMISTRY

Section Id :	23079637
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	50
Number of Questions to be attempted :	50
Section Marks :	50
Mark As Answered Required? :	Yes
Sub-Section Number :	1

Sub-Section Id : 23079637

Question Shuffling Allowed : Yes

Question Number : 51 Question Id : 2307962201 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The time taken for 10% completion of a first order reaction is 20 mins.Then for 19% completion, the reaction will take log 81 = 1.9085, log 90=1.9542

Options :

1. ✔ 40 mins

2. ✖ 60 mins

3. ✖ 30 mins

4. ✖ 50 mins

Question Number : 52 Question Id : 2307962202 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

At 25°C K_a of HPO_4^{2-} and HSO_3^- are $4.8X10^{-13}$ and $6.3x\ 10^{-8}$ respectively. Which of the following is correct?

Options :

HPO_4^{2-} is a stronger acid than HSO^{3-} and PO_4^{3-} is a weaker base than SO_3^{2-}.

1. ✖

2. ✖

HPO_4^{2-} is weaker acid than HSO_3^- and PO_4^{3-} is a weaker base than SO_3^{2-}.

3. ✔ HPO_4^{2-} is a Weaker acid than HSO_3^- and PO_4^{3-} is a stronger base than SO_3^{2-}.

4. ✖ HPO_4^{2-} is a Stronger acid than HSO_3^- and PO_4^{3-} is a stronger base than SO_3^{2-}.

Question Number : 53 Question Id : 2307962203 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In which of the following species the octet rule is NOT obeyed?

I. I_3^- II. N_2O III. OF_2 IV. NO^+

Options :

1. ✖ I and IV

2. ✖ II and III

3. ✔ I only

4. ✖ IV only

Question Number : 54 Question Id : 2307962204 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Morphine, a pain killer is basic with the molecular formula $C_{17}H_{19}NO_3$. The conjugate acid of morphine is

Options :

1. ✖ $C_{17}H_{19}NO_3^+$

2. ✖ $C_{17}H_{18}NO_3$

3. ✖ $C_{17}H_{19}NO^{3-}$

4. ✔ $C_{17}H_{20}NO_3^+$

Question Number : 55 Question Id : 2307962205 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The correct IUPAC name of the compound, $[Pt(py)_4][Pt(Br)_4]$ is

Options :

1. ✔ Tetrapyridineplatinum (II) tetrabromidoplatinate(II)

2. ✖ Tetrabromidoplatinum (IV) tetrapyridineplatinate(II)

3. ✖ Tetrabromidoplatinate(I) tetrapyridineplatinum(II)

4. ✖ Tetrapyridineplatinum (IV) tetrabromidplatinate(IV)

Question Number : 56 Question Id : 2307962206 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which statement is incorrect about peptide bond?

Options :

1. ✔ C-Nbond length in proteins is longer than usual C-N bond

2. ✖ Spectroscopic analysis show planar structure of –CONH-

3. ✖ C-Nbond length in proteins is smaller than usual bond length of C-N bond

4. ✖ Proteins on hydrolysis gives L-α-amino acids

Question Number : 57 Question Id : 2307962207 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The decomposition of a radioactive substance follows I order reaction. The half life for radioactive decay of C^{14} is 5730 years. An archaeological artifact containing wood had only 80% of C^{14} found in a living tree. Calculate the age of sample in years (log 80 = 1.9031)

Options :

1. ✖ 1728.8 years

2. ✖ 1278.7 years

3. ✔ 1845 years

4. ✖ 1268.7 years

Question Number : 58 Question Id : 2307962208 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is the strongest oxidizing agent?

Options :

1. ✖ Cl^-

2. ✖ Mn^{2+}

3. ✔ MnO_4^-

4. ✖ Cr^{3+}

Question Number : 59 Question Id : 2307962209 Question Type : MCQ Option Shuffling : No Is

Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Vapour density of an organic compound is 23. It contains 52.17% of carbon and 13% of hydrogen is: The compound gives iodoform test. The compound is

Options :

1. ✔ Ethanol

2. ✖ Dimethyl ether

3. ✖ Acetone

4. ✖ Methanol

Question Number : 60 Question Id : 2307962210 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

An organic compound A (C_4H_9Cl) on reaction with Na/diethyl ether gives a hydrocarbon which on monochlorination gives only one chloro derivative, then A is

Options :

1. ✔ Tert-butyl chloride

2. ✖ Sec-butyl chloride

3. ✖ Isobutyl chloride

4. ✖ n-butyl chloride

Question Number : 61 Question Id : 2307962211 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The quantity of charge required to obtain one mole of aluminum from Al_2O_3 is _____.

Options :

1. ✖ 1F

2. ✖ 6F

3. ✔ 3F

4. ✖ 2F

Question Number : 62 Question Id : 2307962212 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The substance which is not an artificial sweetener

Options :

1. ✖ Sucralose

2. ✖ Alitame

3. ✖ Saccharin

4. ✔ Sucrose

Question Number : 63 Question Id : 2307962213 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The chalcogen containing equal number of ‘s’ and ‘p’ electron is

Options :

1. ✔ O

2. ✖ S

3. ✖ Mg

4. ✖ Te

Question Number : 64 Question Id : 2307962214 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Given that polymers: A=Nylon,B=Buna-S, C=Polythene. Arrange these in the increasing order of their intermolecular forces.

Options :

1. ✖ A<B<C

2. ✖ A<C<B

3. ✔ B<C<A

4. ✖ C<A<B

Question Number : 65 Question Id : 2307962215 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A, B and C are three elements forming a part of compound in oxidation states of +2,+5 and -2 respectively .What could be the compound ?

Options :

1. ✖ $A_2(BC)_2$

2. ✖ $A_2(BC_4)_3$

3. ✔ $A_3(BC_4)_2$

4. ✖ ABC

Question Number : 66 Question Id : 2307962216 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following ions will give colourless aqueous solution?

Options :

1. ✖ Ni^{2+}

2. ✖ Fe^{2+}

3. ✖ Cu^{2+}

4. ✔ Cu^{+}

Question Number : 67 Question Id : 2307962217 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

How many ions are produced from $[Co(NH_3)_6]CI_2$ in solution?

Options :

1. ✖ 6

2. ✖ 4

3. ✔ 3

4. ✖ 2

Question Number : 68 Question Id : 2307962218 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Bleaching action of SO_2 is due to

Options :

1. ✔ Reduction

2. ✖ Oxidation

3. ✖ Hydrolysis

4. ✖ Its acidic nature

Question Number : 69 Question Id : 2307962219 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Nessler's reagent is

Options :

1. ✔ K_2HgI_4

2. ✖ K_2HgI_4+KOH

3. ✖ H_2HgI_4+KOH

4. ✖ K_2HgI_4+Hg

Question Number : 70 Question Id : 2307962220 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

When acetylene magnesium chloride reacts with ethyl bromide, product obtained is

Options :

1. ✔ 1-Butyne

2. ✖ 2-Butyne

3. ✖ 1,2 Butadiere

4. ✖ 1,3 Buta dieve

Question Number : 71 Question Id : 2307962221 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

One mole of symmetric alkene on ozonolysis gives two moles of aldehyde having a molar mass of 44 u. The alkene is

Options :

1. ✖ Propene

2. ✖ 1-Butyne

3. ✔ 2-Butene

4. ✖ Ether

Question Number : 72 Question Id : 2307962222 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is not a common component of photochemical smog.

Options :

1. ✖ HCHO

2. ✖ Acrolein

3. ✖ Peroxy acetal nitrate

4. ✔ CFCs

Question Number : 73 Question Id : 2307962223 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following salts will have the same value of Von't Hoff factor (i) as that of $K_4[Fe(CN)_6]$

Options :

1. ✔ $Al_2(SO_4)_3$

2. ✖ $NaCl$

3. ✖ $A1(NO_3)_3$

4. ✖ Na_2SO_4

Question Number : 74 Question Id : 2307962224 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The reagent which does not react with both acetone and benzaldehyde

Options :

1. ✖ $NaHSO_3$

2. ✖ Phenyl hydrazine

3. ✔ Fehling's solution

4. ✖ Grignard reagent

Question Number : 75 Question Id : 2307962225 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If molality of a dilute solution is doubled, the value of molal depression constant, K_f will be

Options :

1. ✖ Doubled

2. ✖ Halved

3. ✖ Tripled

4. ✔ Unchanged

Question Number : 76 Question Id : 2307962226 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following electrolytes will have maximum coagulating value for AgI/Ag^+

Options :

1. ✖ Na_2S

2. ✖ Na_3PO_4

3. ✖ Na_2SO_4

4. ✔ $NaCl$

Question Number : 77 Question Id : 2307962227 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following pairs has the same size ?

Options :

1. ✖ Fe^{2+}, Ni^{2+}

2. ✖ Zr^{4+}, Ti^{4+}

3. ✔ Zr^{4+}, Hf^{4+}

4. ✖ Zn^{2+}, Hf^{4+}

Question Number : 78 Question Id : 2307962228 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In the extraction of copper from its sulphide ore, the metal is finally obtained by the reduction of cuprous oxide with

Options :

1. ✖ carbon monoxide

2. ✔ copper (I) sulphide

3. ✖ sulphur dioxide

4. ✖ iron (II) sulphide

Question Number : 79 Question Id : 2307962229 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Oxidation number and co-ordination number of silver in Tollen's reagent respectively are

Options :

1. ✖ +1,1

2. ✖ +2,1

3. ✖ +2,2

4. ✔ +1,2

Question Number : 80 Question Id : 2307962230 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The total number of electrons in 18mL of water (density = 1g/mL) is

Options :

1. ✖ 6.02×10^{23}

2. ✖ 6.02×10^{25}

3. ✔ 6.02×10^{24}

4. ✖ $6.02 \times 18 \times 10^{23}$

Question Number : 81 Question Id : 2307962231 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The transition in hydrogen atom which will give rise to least energetic photon according to Bohr's theory is

Options :

1. ✖ n=6 to n=1

2. ✖ n=5 to n=4

3. ✔ n=6 to n=5

4. ✖ n=5 to n=3

Question Number : 82 Question Id : 2307962232 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If the quantum numbers of electron in an atom are specified as n=3, l=0, m=0, then atomic number is possibly

Options :

1. ✖ 12,13

2. ✖ 13,14

3. ✖ 10,11

4. ✔ 11,12

Question Number : 83 Question Id : 2307962233 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The electronegativity of the following elements increases in the order of

Options :

1. ✖ C,N,Si,P

2. ✖ N,Si,C,P

3. ✔ Si,P,C,N

4. ✖ P,Si,N,C

Question Number : 84 Question Id : 2307962234 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The number of bonds in 1-phenylprop-1-ene is

Options :

1. ✖ 14 sigma, 8 pi

2. ✖ 18 sigma, 8 pi

3. ✔ 19 sigma, 4 pi

4. ✖ 14 sigma, 2 pi

Question Number : 85 Question Id : 2307962235 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The species having Bond order similar to that in CO

Options :

1. ✔ N_2

2. ✖

O_2^{-2}

3. ✖ O_2

4. ✖ H_2

Question Number : 86 Question Id : 2307962236 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The number of atoms present in one mole of an element is equal to Avogadro number. Which of the following element contains the greatest number of atoms?

Options :

1. ✖ 4g He

2. ✖ 46g Na

3. ✖ 0.40g Ca

4. ✔ 12g He

Question Number : 87 Question Id : 2307962237 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Rank the following in the order of increasing entropy

a) 1 mole of H_2O (l) at 25^0C and 1 atm P

b) 2 mole of H_2O (s) at 0^0C and 1 atm P

c) 1 mole of H_2O (g) at 100 ^0C and 1 atm P

d) 1 mole of H_2O (l) at 0^0C and 1 atm P

Options :

1. ✔ b<d<a<c

2. ✖ b<a<d<c

3. ✖ b<c<a<d

4. ✖ b<c<d<a

Question Number : 88 Question Id : 2307962238 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The reaction between sodium and water can be made less vigorous by

Options :

1. ✖ increasing the temperature

2. ✖ adding a little alcohol

3. ✔ Amalgamating sodium

4. ✖ adding a little acetic acid

Question Number : 89 Question Id : 2307962239 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

For the reaction $N_2 + 3H_2 \rightleftharpoons 2NH_3$ at 400K , Kp = 41. Kp for the reaction $\frac{1}{2} N_2 + 3/2\ H_2 \rightleftharpoons NH_3$ will be

Options :

1. ✔ 6.4

2. ✖ 0.02

3. ✖ 50

4. ✖ 4.6

Question Number : 90 Question Id : 2307962240 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The product formed when phenol is treated with $CHCl_3$ and NaOH is

Options :

1. ✖ 3-hydroxybenzaldehyde

2. ✖ 2- hydroxybenzoic acid

3. ✖ 3-hydroxybenzoic acid

4. ✔ 2-hydroxybenzaldehyde

Question Number : 91 Question Id : 2307962241 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following is not an antacid

Options :

1. ✖ Aluminium hydroxide

2. ✖ Cimetidine

3. ✔ Phenelzine

4. ✖ Ranitidine

Question Number : 92 Question Id : 2307962242 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The carboxyl functional group(-COOH) is present in

Options :

1. ✖ Picric acid

2. ✖ Barbituric acid

3. ✖ Ascorbic acid

4. ✔ Aspirin

Question Number : 93 Question Id : 2307962243 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Aluminium is extracted from alumina by electrolysis of a molten mixture of

Options :

1. ✖ $Al_2O_3+HF+NaAlF_4$

2. ✖ $Al_2O_3+CaF_2+NaAlF_4$

3. ✔ $Al_2O_3+CaF_2+Na_3AlF_6$

4. ✖ $Al_2O_3+KF+Na_2AlF_6$

Question Number : 94 Question Id : 2307962244 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following B group vitamin can be stored in our body?

Options :

1. ✖ Vitamin B_1

2. ✖ Vitamin B_2

3. ✖ Vitamin B_6

4. ✔ Vitamin B_{12}

Question Number : 95 Question Id : 2307962245 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The number of structural isomers possible from the molecular formula C_3H_9N is

Options :

1. ✖ 5

2. ✖ 2

3. ✖ 3

4. ✔ 4

Question Number : 96 Question Id : 2307962246 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The gas emitted by supersonic jet planes that slowly depletes the ozone layer is

Options :

1. ✖ CO

2. ✔ NO

3. ✖ SO_2

4. ✖ O_2

Question Number : 97 Question Id : 2307962247 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Among the following compounds, the one that is most reactive towards electrophilic nitration is

Options :

1. ✖ benzoic acid

2. ✖ nitrobenzene

3. ✔ Toluene

4. ✖ benzene

Question Number : 98 Question Id : 2307962248 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following has the highest melting point?

Options :

1. ✖ o-Xylene

2. ✖ m-Xylene

3. ✔ P-Xylene

4. ✖ Toluene

Question Number : 99 Question Id : 2307962249 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Butylated hydroxyl toluene as a food additive act as

Options :

1. ✔ antioxidant

2. ✖ flavouring agent

3. ✖ colouring agent

4. ✖ emulsifier

Question Number : 100 Question Id : 2307962250 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The major product formed when 2-bromo-2-methylbutane is refluxed with ethanolic KOH is

Options :

1. ✔ 2- methylbut-2-ene

2. ✖ 2- methylbutan-1-ol

3. ✖ 2- methylbut-1-ene

4. ✖ 2- methylbutan-2-ol

MATHEMATICS

Section Id :	23079638
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	50
Number of Questions to be attempted :	50
Section Marks :	50
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	23079638
Question Shuffling Allowed :	Yes

Question Number : 101 Question Id : 2307962251 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $tan^{-1}x - cot^{-1}x = \frac{\pi}{6}$, then x is

Options :

1. ✔ $\sqrt{3}$

2. ✖ $2\sqrt{3}$

3. ✖ $\frac{\sqrt{3}}{2}$

4. ✖ $\frac{1}{\sqrt{3}}$

Question Number : 102 Question Id : 2307962252 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

In an ellipse the distance between its foci is 6 and length of the minor axis is 8. The eccentricity is

Options :

1. ✔ $\frac{3}{5}$

2. ✖ $\frac{1}{2}$

3. ✖ $\frac{4}{5}$

4. ✖ $\frac{1}{\sqrt{5}}$

Question Number : 103 Question Id : 2307962253 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The line $\frac{x-4}{1} = \frac{y-2}{1} = \frac{z-k}{2}$ lies completely in the plane 2x-4y+z = 7 for

Options :

1. ✔ $k = 7$

2. ✖ $k = -7$

3. ✖ $k = 1$

4. ✖ $k = -3$

Question Number : 104 Question Id : 2307962254 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If f(x) = $\sqrt{9-x^2}$ and $f^{-1}(x) = f(x)$, then the domain and range of f(x) are respectively,

Options :

1. ✖ [-3 , 3] ; [0,3]

2. ✖ [-3 , 3] ; [-3,3]

3. ✔ [0,3] ; [0,3]

4. ✖ [-3 , 3] ; R

Question Number : 105 Question Id : 2307962255 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The line $\sqrt{5}x = y + 3$ touches the hyperbola $2x^2 - y^2 = 6$ at the point

Options :

1. ✔ $(\sqrt{5}, 2)$

2. ✖ $(-\sqrt{5}, -8)$

3. ✖ $(\sqrt{5}, -2)$

4. ✖ $(2\sqrt{5}, 7)$

Question Number : 106 Question Id : 2307962256 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $f(2) = 4$ and $f'(2)=1$, then $\lim_{x \to 2} \frac{xf(2)-2f(x)}{x-2}$ is

Options :

1. ✖ -2

2. ✖ 1

3. ✔ 2

4. ✖ 3

Question Number : 107 Question Id : 2307962257 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If the midpoints of the sides of a triangle AB,BC and CA are D(1,2,-3) ,E(3,0,1) and F(-1,1,-4) , the centroid of the triangle ABC is

Options :

1. ✖ $(1,1,2)$

2. ✖ $(1,1,-3)$

3. ✖ $(1,-1,2)$

4. ✔ $(1,1,-2)$

Question Number : 108 Question Id : 2307962258 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The distance of the point (1,-5,9) from the plane x-y+z = 5 measured along a straight line x = y =z is

Options :

1. ✖ $3\sqrt{5}$

2. ✔ $10\sqrt{3}$

3. ✖ $5\sqrt{3}$

4. ✖ $3\sqrt{10}$

Question Number : 109 Question Id : 2307962259 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The area of the region bounded by the curve x = 2y+3 and the lines y =1, y = -1 is

Options :

1. ✖ 4 sq units

2. ✖ $\frac{3}{2}$ sq units

3. ✔ 6 sq units

4. ✖ 8 sq units

Question Number : 110 Question Id : 2307962260 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

$$\int_0^{\frac{\pi}{4}} \frac{sin2x}{sin^4x + cos^4x} dx =$$

Options :

1. ✖ π

2. ✖ $\frac{\pi}{2}$

3. ✔ $\frac{\pi}{4}$

4. ✖ 0

Question Number : 111 Question Id : 2307962261 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let $f(x) = x^2 - 1$ then At $x = 0$, $f(x)$ has

Options :

1. ✖ maximum

2. ✔ minimum

3. ✖ maximum and minimum

4. ✖ neither maximum nor minimum

Question Number : 112 Question Id : 2307962262 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If A is a square matrix such that $A - A' = 0$, then A' is

Options :

1. ✖ orthogonal matrix

2. ✔ symmetric matrix

3. ✖ skew-symmetric matrix

4. ✖ triangular matrix

Question Number : 113 Question Id : 2307962263 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The value of $I = \int_0^{\frac{\pi}{2}} (\sin^{100}x - \cos^{100}x)\ dx$ is

Options :

1. ✖ $\frac{1}{100}$

2. ✖ 100

3. ✖ 1

4. ✔ 0

Question Number : 114 Question Id : 2307962264 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Two finite sets have m and n elements. The number of subsets of the first set is 112 more than that of the second set. The values of m and n are, respectively,

Options :

1. ✖ 4, 7

2. ✔ 7, 4

3. ✖ 4, 4

4. ✖ 7, 7

Question Number : 115 Question Id : 2307962265 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The value of $\cos\left[\cos^{-1}\left(-\frac{\sqrt{3}}{2}\right)+\frac{\pi}{6}\right]$ is

Options :

1. ✖ 1

2. ✔ -1

3. ✖ 0

4. ✖ -2

Question Number : 116 Question Id : 2307962266 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The solution set of the inequality $-12 < 4 - \frac{3x}{-5} \leq 2$ is

Options :

1. ✖ $\left(-\frac{80}{3}, -\frac{10}{3}\right)$

2. ✔ $\left(-\frac{80}{3}, -\frac{10}{3}\right]$

3. ✖ $\left[\frac{80}{3}, -\frac{10}{3}\right)$

4. ✖ $\left[\frac{80}{3}, \frac{10}{3}\right)$

Question Number : 117 Question Id : 2307962267 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The value of λ such that sum of the squares of the roots of the quadratic equation,

$x^2 + (3 - \lambda)x + 2 = \lambda$ has the least value is

Options :

1. ✔ 2

2. ✖ $\frac{4}{9}$

3. ✖ 1

4. ✖ $\frac{15}{8}$

Question Number : 118 Question Id : 2307962268 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If the complex number z satisfying $z + |z| = 2 + 8i$, then the value of $|z|$ is

Options :

1. ✖ 8

2. ✔ 17

3. ✖ 15

4. ✖ 24

Question Number : 119 Question Id : 2307962269 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $A = \begin{bmatrix} a & 0 & 0 \\ 0 & a & 0 \\ 0 & 0 & a \end{bmatrix}$, then $\det(\text{adj } A)$ is

Options :

1. ✖ a^{27}

2. ✖ a^{9}

3. ✔ a^{6}

4. ✖ a^{2}

Question Number : 120 Question Id : 2307962270 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The number of students who take both the subjects mathematics and chemistry is 30. This represents 10% of the enrolment in mathematics and 12% of the enrolment in chemistry. How many students take at least one of these two subjects?

Options :

1. ✖ 480

2. ✖ 490

3. ✖ 560

4. ✔ 520

Question Number : 121 Question Id : 2307962271 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $3f(x) - f\left(\frac{1}{x}\right) = \log x^4$, then $f(e^{-x})$ is

Options :

1. ✖ $1 + x$

2. ✖ $\frac{1}{x}$

3. ✖ x

4. ✔ $-x$

Question Number : 122 Question Id : 2307962272 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The solution of the LPP : Maximize Z = 2x+3y subject to $x+y \leq 4, x \geq 0, y \geq 0$ is given by

Options :

1. ✔ Max value = 12 at (0,4)

2. ✖ Max value = 12 at (4,0)

3. ✖ Max value = 8 at (4,0)

4. ✖ Max value = 8 at (0,4)

Question Number : 123 Question Id : 2307962273 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Which of the following functions is the inverse of itself ?

Options :

1. ✖ $f(x) = 3^{\log x}$

2. ✖ $f(x) = 3^{x(x+1)}$

3. ✔ $f(x) = \frac{1-x}{1+x}$

4. ✖ $f(x) = 3x - 4$

Question Number : 124 Question Id : 2307962274 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The value of $\cot^{-1}\frac{ab+1}{a-b}+\cot^{-1}\frac{bc+1}{b-c}+\cot^{-1}\frac{ca+1}{c-a}$ is

Options :

1. ✔ 0

2. ✖ 1

3. ✖ $\frac{\pi}{4}$

4. ✖ $\frac{\pi}{2}$

Question Number : 125 Question Id : 2307962275 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The number of natural numbers less than 7,000 which can be formed by using the digits 0, 1, 3, 7, 9 (repetition of digits allowed) is equal to

Options :

1. ✖ 375

2. ✔ 374

3. ✖ 250

4. ✖ 372

Question Number : 126 Question Id : 2307962276 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The number of arrangements of the letters of the word BANANA in which two Ns do not appear adjacently is

Options :

1. ✔ 40

2. ✖ 60

3. ✖ 80

4. ✖ 20

Question Number : 127 Question Id : 2307962277 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $A = \begin{bmatrix} 1 & 2 \\ 3 & 5 \end{bmatrix}$, then the value of the determinant $|A^{2009} - 5A^{2008}|$ is

Options :

1. ✖ -2

2. ✖ -7

3. ✔ -6

4. ✖ -1

Question Number : 128 Question Id : 2307962278 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let a, b and c be the 7^{th}, 11^{th} and 13^{th} terms respectively of a non constant A. P.

If these are also the three consecutive terms of a G. P., then $\frac{a}{c}$ is equal to

Options :

1. ✖ 2

2. ✖ $\frac{1}{2}$

3. ✔ 4

4. ✖ $\frac{7}{13}$

Question Number : 129 Question Id : 2307962279 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A line passes through (2 , 2) and is perpendicular to the line $3x + y = 3$.

Its y – intercept is _____

Options :

1. ✖ $\frac{1}{2}$

2. ✖ $\frac{2}{3}$

3. ✔ $\frac{4}{3}$

4. ✖ $\frac{1}{3}$

Question Number : 130 Question Id : 2307962280 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

$$\lim_{x\to\frac{\pi}{6}} \frac{\sqrt{3}sinx-cosx}{x-\frac{\pi}{6}} =$$

Options :

1. ✔ 2

2. ✖ -2

3. ✖ 3

4. ✖ -3

Question Number : 131 Question Id : 2307962281 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $x = 3\tan t$ and $y = 3\sec t$, then the value of $\frac{d^2y}{dx^2}$ at $t = \frac{\pi}{4}$, is

Options :

1. ✔ $\frac{1}{6\sqrt{2}}$

2. ✖ $\frac{\sqrt{2}}{6}$

3. ✖

$\frac{1}{3\sqrt{2}}$

4. ✖ 1

Question Number : 132 Question Id : 2307962282 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The rate of change of diagonal length R of a square with respect to its area A is

Options :

1. ✖ R

2. ✖ $\sqrt{A}$

3. ✖ 1

4. ✔ $\frac{1}{R}$

Question Number : 133 Question Id : 2307962283 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $\int_0^{\pi} x\, f(\sin x)\, dx = A \int_0^{\pi/2} f(\sin x)\, dx$, then A is

Options :

1. ✔ π

2. ✖ 2π

3. ✖ $\frac{\pi}{2}$

4. ✖ 0

Question Number : 134 Question Id : 2307962284 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If the area enclosed between the curves $y = kx^2$ and $x = ky^2$, $(k > 0)$, is 1 square unit. Then k is

Options :

1. ✖ $\frac{2}{\sqrt{3}}$

2. ✖ $\frac{\sqrt{3}}{2}$

3. ✔ $\frac{1}{\sqrt{3}}$

4. ✖ $\frac{4}{\sqrt{3}}$

Question Number : 135 Question Id : 2307962285 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Let $\vec{a} = \hat{i} - \hat{k}$, $\vec{b} = x\hat{i} + \hat{j} + (1-x)\hat{k}$ and $\vec{c} = y\hat{i} + x\hat{j} + (1+x-y)\hat{k}$.

Then $[\vec{a}\ \vec{b}\ \vec{c}]$ depends on

Options :

1. ✖ only x

2. ✖ only y

3. ✔ neither x nor y

4. ✖ both x and y

Question Number : 136 Question Id : 2307962286 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The equation of the plane passing through the points $(2, 3, 1)$ and $(4, -5, 3)$ and parallel to X- axis is

Options :

1. ✖ $y - 4z = 7$

2. ✖ $y + 4z = -7$

3. ✖ $x + 4z = 7$

4. ✔ $y + 4z = 7$

Question Number : 137 Question Id : 2307962287 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

A bag contains 4 red and 6 black balls. A ball is drawn at random from the bag, its colour is observed and this ball along with two additional balls of same colour is returned to the bag. If now a ball is drawn at random from the bag, then the probability that this drawn ball is red, is

Options :

1. ✖

$\frac{1}{5}$

2. ✖ $\frac{3}{4}$

3. ✖ $\frac{3}{5}$

4. ✔ $\frac{2}{5}$

Question Number : 138 Question Id : 2307962288 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The mean of five observations is 5 and their variance is 9.20. If three of the given five observations are 1, 3 and 8, then a ratio of other two observations is

Options :

1. ✖ $6 : 7$

2. ✔ $4 : 9$

3. ✖ $5 : 8$

4. ✖ 10

Question Number : 139 Question Id : 2307962289 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The coefficient of x^n in the expansion of $(1+x)^{2n}$ and $(1+x)^{2n-1}$ are in the ratio

Options :

1. ✖ 1:2

2. ✖ 1:3

3. ✖ 3:1

4. ✔ 2:1

Question Number : 140 Question Id : 2307962290 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

If $\left(\frac{1+i}{1-i}\right)^x = 1$, then

Options :

1. ✔ x = 4n, where n is any positive integer

2. ✖ x = 2n, where n is any positive integer

3. ✖ x = 4n + 1, where n is any positive integer

4. ✖ $x = 2n + 1$, where n is any positive integer

Question Number : 141 Question Id : 2307962291 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Determine the area under the curve $y = \sqrt{a^2 - x^2}$ between the lines x=0 and x=a

Options :

1. ✔ $\frac{\pi a^2}{4}$ sq units

2. ✖ $\frac{\pi a^2}{2}$ sq units

3. ✖ $\frac{\pi a^2}{3}$ sq units

4. ✖ $\frac{\pi a}{4}$ sq units

Question Number : 142 Question Id : 2307962292 Question Type : MCQ Option Shuffling : No

Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The function given by f(x)= tan$x$ is discontinuous on the set

Options :

1. ✖ $\{n\pi : n \epsilon Z\}$

2. ✖ $\{2\ n\pi : n\epsilon Z\}$

3. ✔ $\left\{(2n+1)\frac{\pi}{2} : n\epsilon Z\right\}$

4. ✖ $\left\{\frac{n\pi}{2} : n\epsilon Z\right\}$

Question Number : 143 Question Id : 2307962293 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Find the image of the point (1,3,4) in the plane x-y+z=5

Options :

1. ✔ (3,1,6)

2. ✖ (3,-1,6)

3. ✖ (3,1,-6)

4. ✖ (-3,1,6)

Question Number : 144 Question Id : 2307962294 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

$If\ P(A) = \frac{4}{5}\ and\ P(A \cap B) = \frac{7}{10},\ then\ \ P(B|A)\ is\ equal\ to$

Options :

1. ✖ $\frac{1}{10}$

2. ✖ $\frac{1}{8}$

3. ✔ $\frac{7}{8}$

4. ✖ $\frac{17}{20}$

Question Number : 145 Question Id : 2307962295 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

Suppose that two cards are drawn at random from deck of cards. Let X be the number of aces obtained. Then the value of E(X) is

Options :

1. ✖ $\frac{37}{221}$

2. ✖ $\frac{5}{13}$

3. ✖ $\frac{1}{13}$

4. ✔ $\frac{2}{13}$

Question Number : 146 Question Id : 2307962296 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The value of $\tan\left(2\tan^{-1}\frac{1}{5} - \frac{\pi}{4}\right)$ is

Options :

1. ✔ $\frac{-7}{17}$

2. ✖ $\frac{7}{17}$

3. ✖ $\frac{-7}{5}$

4. ✖ $\frac{7}{5}$

Question Number : 147 Question Id : 2307962297 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

$If\ \sin^{-1}\left[\frac{x^2-y^2}{x^2+y^2}\right] = K,\ then\ \frac{dy}{dx}\ is$

Options :

1. ✖ $\frac{-y}{x}$

2. ✖ $\frac{y}{2x}$

3. ✔ $\frac{y}{x}$

4. ✖ $\frac{-y}{2x}$

Question Number : 148 Question Id : 2307962298 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

$Find \frac{d^2y}{dx^2} when \theta = \frac{\pi}{2}. \ If \ x = a(\theta + sin\ \theta) \ and \ y = a(1 - cos\ \theta)$

Options :

1. ✖ $\frac{-1}{a}$

2. ✖ $\frac{2}{a}$

3. ✔ $\frac{1}{a}$

4. ✖ $\frac{-2}{a}$

Question Number : 149 Question Id : 2307962299 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The intervals in which the function $f(x) \frac{3}{10}x^4 - \frac{4}{5}x^3 - 3x^2 + \frac{36}{5}x + 11$ is decreasing is

Options :

1. ✖ $(-\infty, -2) \cup (2,3)$

2. ✖ $(-\infty, -2) \cup (0, 3)$

3. ✔

$(-\infty, -2) \cup (1, 3)$

4. ✖ $(-\infty, -2) \cup (-2, 3)$

Question Number : 150 Question Id : 2307962300 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 1 Wrong Marks : 0

The derivative of $\cos^{-1}(2x^2-1)$ w.r.t. $\cos^{-1}x$ is

Options :

1. ✔ 2

2. ✖ $\frac{-1}{2\sqrt{1-x^2}}$

3. ✖ $\frac{2}{x}$

4. ✖ $1-x^2$