

JEE 2023 Session-1 24th Jan to 1st Feb 2023

Application No	
Candidate Name	
Roll No	
Test Date	25/01/2023
Test Time	9:00 AM - 12:00 PM
Subject	B TECH

Section : Physics Section A

Q.1 The root mean square velocity of molecules of gas is

Options

1. Inversely proportional to square root of temperature $\left(\sqrt{\frac{1}{T}}\right)$
2. Proportional to square root of temperature $\left(\sqrt{T}\right)$
3. Proportional to square of temperature (T^2)
4. Proportional to temperature (T)

Question Type : MCQ

Question ID : 3666941178

Option 1 ID : 3666943542

Option 2 ID : 3666943540

Option 3 ID : 3666943541

Option 4 ID : 3666943539

Status : Answered

Chosen Option : 2

Q.2 Match List I with List II

List I	List II
A. Surface tension	I. $\text{kg m}^{-1}\text{s}^{-1}$
B. Pressure	II. kg ms^{-1}
C. Viscosity	III. $\text{kg m}^{-1}\text{s}^{-2}$
D. Impulse	IV. kg s^{-2}

Choose the correct answer from the options given below:

Options 1. A-IV , B-III , C-II , D-I

2. A-II , B-I , C-III , D-IV

3. A-III , B-IV , C-I , D-II

4. A-IV , B-III , C-I , D-II

Question Type : MCQ

Question ID : 3666941171

Option 1 ID : 3666943511

Option 2 ID : 3666943513

Option 3 ID : 3666943512

Option 4 ID : 3666943514

Status : Answered

Chosen Option : 4

Q.3 Match List I with List II

List I (Current configuration)	List II (Magnitude of Magnetic Field at point O)
A.	I. $B_0 = \frac{\mu_0 I}{4\pi r} [\pi + 2]$
B.	II. $B_0 = \frac{\mu_0 I}{4} \frac{1}{r}$
C.	III. $B_0 = \frac{\mu_0 I}{2\pi r} [\pi - 1]$
D.	IV. $B_0 = \frac{\mu_0 I}{4\pi r} [\pi + 1]$

Choose the correct answer from the options given below :

- Options 1. A-I, B-III, C-IV, D-II
 2. A-III, B-IV, C-I, D-II
 3. A-III, B-I, C-IV, D-II
 4. A-II, B-I, C-IV, D-III

Question Type : MCQ

Question ID : 3666941182

Option 1 ID : 3666943556

Option 2 ID : 3666943555

Option 3 ID : 3666943557

Option 4 ID : 3666943558

Status : Answered

Chosen Option : 3

- Q.4 Assume that the earth is a solid sphere of uniform density and a tunnel is dug along its diameter throughout the earth. It is found that when a particle is released in this tunnel, it executes a simple harmonic motion. The mass of the particle is 100 g. The time period of the motion of the particle will be (approximately)

(Take $g=10 \text{ m s}^{-2}$, radius of earth = 6400 km)

- Options 1. 24 hours
 2. 1 hour 40 minutes
 3. 12 hours
 4. 1 hour 24 minutes

Question Type : MCQ

Question ID : 3666941179

Option 1 ID : 3666943546

Option 2 ID : 3666943544

Option 3 ID : 3666943545

Option 4 ID : 3666943543

Status : Answered

Chosen Option : 4

Q.5 A message signal of frequency 5 kHz is used to modulate a carrier signal of frequency 2 MHz. The bandwidth for amplitude modulation is:

- Options
1. 10 kHz
 2. 20 kHz
 3. 5 kHz
 4. 2.5 kHz

Question Type : MCQ

Question ID : 3666941190

Option 1 ID : 3666943588

Option 2 ID : 3666943590

Option 3 ID : 3666943587

Option 4 ID : 3666943589

Status : Answered

Chosen Option : 2

Q.6 Given below are two statements : one is labelled as Assertion A and the other is labelled as Reason R

Assertion A: Photodiodes are used in forward bias usually for measuring the light intensity.

Reason R: For a p-n junction diode, at applied voltage V the current in the forward bias is more than the current in the reverse bias for $|V_Z| > \pm V \geq |V_0|$ where V_0 is the threshold voltage and V_Z is the breakdown voltage.

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

- Options
1. Both A and R are true and R is correct explanation A
 2. A is false but R is true
 3. A is true but R is false
 4. Both A and R are true but R is NOT the correct explanation A

Question Type : MCQ

Question ID : 3666941189

Option 1 ID : 3666943583

Option 2 ID : 3666943586

Option 3 ID : 3666943585

Option 4 ID : 3666943584

Status : Answered

Chosen Option : 4

Q.7 A Carnot engine with efficiency 50% takes heat from a source at 600 K. In order to increase the efficiency to 70%, keeping the temperature of sink same, the new temperature of the source will be :

- Options
1. 1000 K
 2. 360 K
 3. 300 K
 4. 900 K

Question Type : MCQ

Question ID : 3666941177

Option 1 ID : 3666943538

Option 2 ID : 3666943536

Option 3 ID : 3666943535

Option 4 ID : 3666943537

Status : Answered

Chosen Option : 1

Q.8 In an LC oscillator, if values of inductance and capacitance become twice and eight times, respectively, then the resonant frequency of oscillator becomes x times its initial resonant frequency ω_0 . The value of x is:

- Options 1. $\frac{1}{16}$
 2. 16
 3. 4
 4. $\frac{1}{4}$

Question Type : MCQ

Question ID : 3666941184

Option 1 ID : 3666943565

Option 2 ID : 3666943566

Option 3 ID : 3666943563

Option 4 ID : 3666943564

Status : Not Attempted and
Marked For Review

Chosen Option : --

Q.9 A car is moving with a constant speed of 20 m/s in a circular horizontal track of radius 40 m. A bob is suspended from the roof of the car by a massless string. The angle made by the string with the vertical will be : (Take $g = 10 \text{ m/s}^2$)

- Options 1. $\frac{\pi}{3}$
 2. $\frac{\pi}{4}$
 3. $\frac{\pi}{2}$
 4. $\frac{\pi}{6}$

Question Type : MCQ

Question ID : 3666941173

Option 1 ID : 3666943520

Option 2 ID : 3666943521

Option 3 ID : 3666943519

Option 4 ID : 3666943522

Status : Answered

Chosen Option : 1

Q.10 The ratio of the density of oxygen nucleus ($^{16}_8\text{O}$) and helium nucleus (^4_2He) is

- Options 1. 1:1
 2. 8:1
 3. 2:1
 4. 4:1

Question Type : MCQ

Question ID : 3666941186

Option 1 ID : 3666943573

Option 2 ID : 3666943571

Option 3 ID : 3666943572

Option 4 ID : 3666943574

Status : Answered

Chosen Option : 4

Q.11 A uniform metallic wire carries a current 2 A, when 3.4 V battery is connected across it. The mass of uniform metallic wire is $8.92 \times 10^{-3} \text{ kg}$, density is $8.92 \times 10^3 \text{ kg/m}^3$ and resistivity is $1.7 \times 10^{-8} \Omega \cdot \text{m}$. The length of wire is :

- Options 1. $l = 6.8 \text{ m}$
 2. $l = 5 \text{ m}$
 3. $l = 100 \text{ m}$
 4. $l = 10 \text{ m}$

Question Type : MCQ

Question ID : 3666941181

Option 1 ID : 3666943554

Option 2 ID : 3666943552

Option 3 ID : 3666943551

Option 4 ID : 3666943553

Status : Answered

Chosen Option : 4

Q.12 A solenoid of 1200 turns is wound uniformly in a single layer on a glass tube 2 m long and 0.2 m in diameter. The magnetic intensity at the center of the solenoid when a current of 2 A flows through it is:

- Options 1. $1.2 \times 10^3 \text{ A m}^{-1}$
 2. 1 A m^{-1}
 3. $2.4 \times 10^3 \text{ A m}^{-1}$
 4. $2.4 \times 10^{-3} \text{ A m}^{-1}$

Question Type : MCQ

Question ID : 3666941183

Option 1 ID : 3666943559

Option 2 ID : 3666943561

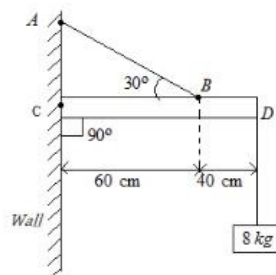
Option 3 ID : 3666943560

Option 4 ID : 3666943562

Status : Answered

Chosen Option : 1

Q.13 An object of mass 8 kg is hanging from one end of a uniform rod CD of mass 2 kg and length 1 m pivoted at its end C on a vertical wall as shown in figure. It is supported by a cable AB such that the system is in equilibrium. The tension in the cable is : (Take $g = 10 \text{ m/s}^2$)



- Options 1. 30 N
 2. 240 N
 3. 300 N
 4. 90 N

Question Type : MCQ

Question ID : 3666941174

Option 1 ID : 3666943523

Option 2 ID : 3666943525

Option 3 ID : 3666943526

Option 4 ID : 3666943524

Status : Not Answered

Chosen Option : --

Q.14 A parallel plate capacitor has plate area 40 cm^2 and plates separation 2 mm . The space between the plates is filled with a dielectric medium of a thickness 1 mm and dielectric constant 5 . The capacitance of the system is :

- Options
1. $\frac{10}{3} \epsilon_0 \text{ F}$
 2. $10 \epsilon_0 \text{ F}$
 3. $24 \epsilon_0 \text{ F}$
 4. $\frac{3}{10} \epsilon_0 \text{ F}$

Question Type : MCQ

Question ID : 3666941180

Option 1 ID : 3666943547

Option 2 ID : 3666943549

Option 3 ID : 3666943550

Option 4 ID : 3666943548

Status : Answered

Chosen Option : 1

Q.15 Electron beam used in an electron microscope, when accelerated by a voltage of 20 kV , has a de-Broglie wavelength of λ_0 . If the voltage is increased to 40 kV , then the de-Broglie wavelength associated with the electron beam would be:

- Options
1. $\frac{\lambda_0}{\sqrt{2}}$
 2. $\frac{\lambda_0}{2}$
 3. $9 \lambda_0$
 4. $3 \lambda_0$

Question Type : MCQ

Question ID : 3666941188

Option 1 ID : 3666943581

Option 2 ID : 3666943582

Option 3 ID : 3666943580

Option 4 ID : 3666943579

Status : Answered

Chosen Option : 1

Q.16 T is the time period of simple pendulum on the earth's surface. Its time period becomes $x T$ when taken to a height R (equal to earth's radius) above the earth's surface. Then, the value of x will be:

- Options
1. $\frac{1}{4}$
 2. 2
 3. 4
 4. $\frac{1}{2}$

Question Type : MCQ

Question ID : 3666941175

Option 1 ID : 3666943529

Option 2 ID : 3666943528

Option 3 ID : 3666943530

Option 4 ID : 3666943527

Status : Answered

Chosen Option : 3

Q.17 In Young's double slits experiment, the position of 5th bright fringe from the central maximum is 5 cm. The distance between slits and screen is 1 m and wavelength of used monochromatic light is 600 nm. The separation between the slits is:

- Options
1. 48 μm
 2. 36 μm
 3. 60 μm
 4. 12 μm

Question Type : MCQ

Question ID : 3666941187

Option 1 ID : 3666943576

Option 2 ID : 3666943575

Option 3 ID : 3666943577

Option 4 ID : 3666943578

Status : Answered

Chosen Option : 1

Q.18 A car travels a distance of 'x' with speed v_1 and then same distance 'x' with speed v_2 in the same direction. The average speed of the car is:

- Options
1. $\frac{v_1 v_2}{2(v_1 + v_2)}$
 2. $\frac{v_1 + v_2}{2}$
 3. $\frac{2 v_1 v_2}{v_1 + v_2}$
 4. $\frac{2x}{v_1 + v_2}$

Question Type : MCQ

Question ID : 3666941172

Option 1 ID : 3666943517

Option 2 ID : 3666943516

Option 3 ID : 3666943518

Option 4 ID : 3666943515

Status : Answered

Chosen Option : 3

Q.19 A bowl filled with very hot soup cools from 98°C to 86°C in 2 minutes when the room temperature is 22°C. How long it will take to cool from 75°C to 69°C ?

- Options
1. 1 minute
 2. 0.5 minute
 3. 2 minutes
 4. 1.4 minutes

Question Type : MCQ

Question ID : 3666941176

Option 1 ID : 3666943533

Option 2 ID : 3666943534

Option 3 ID : 3666943531

Option 4 ID : 3666943532

Status : Answered

Chosen Option : 1

Q.20 An electromagnetic wave is transporting energy in the negative z direction. At a certain point and certain time the direction of electric field of the wave is along positive y direction. What will be the direction of the magnetic field of the wave at that point and instant?

- Options
1. Positive direction of x
 2. Negative direction of y
 3. Positive direction of z
 4. Negative direction of x

Question Type : MCQ

Question ID : 3666941185

Option 1 ID : 3666943567

Option 2 ID : 3666943570

Option 3 ID : 3666943569

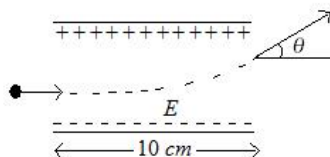
Option 4 ID : 3666943568

Status : Answered

Chosen Option : 4

Section : Physics Section B

Q.21 A uniform electric field of 10 N/C is created between two parallel charged plates (as shown in figure). An electron enters the field symmetrically between the plates with a kinetic energy 0.5 eV . The length of each plate is 10 cm . The angle (θ) of deviation of the path of electron as it comes out of the field is _____ (in degree).



Given --
Answer :

Question Type : SA

Question ID : 3666941195

Status : Not Answered

Q.22 A ray of light is incident from air on a glass plate having thickness $\sqrt{3} \text{ cm}$ and refractive index $\sqrt{2}$. The angle of incidence of a ray is equal to the critical angle for glass-air interface. The lateral displacement of the ray when it passes through the plate is _____ $\times 10^{-2} \text{ cm}$. (given $\sin 15^\circ = 0.26$)

Given --
Answer :

Question Type : SA

Question ID : 3666941192

Status : Not Answered

Q.23 An LCR series circuit of capacitance 62.5 nF and resistance of 50Ω , is connected to an A.C. source of frequency 2.0 kHz . For maximum value of amplitude of current in circuit, the value of inductance is _____ mH.

(Take $\pi^2 = 10$)

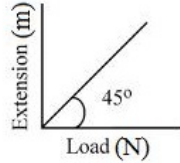
Given --
Answer :

Question Type : SA

Question ID : 3666941193

Status : Not Answered

- Q.24** As shown in the figure, in an experiment to determine Young's modulus of a wire, the extension-load curve is plotted. The curve is a straight line passing through the origin and makes an angle of 45° with the load axis. The length of wire is 62.8 cm and its diameter is 4 mm. The Young's modulus is found to be $x \times 10^4 \text{ Nm}^{-2}$. The value of x is _____.



Given --
Answer :

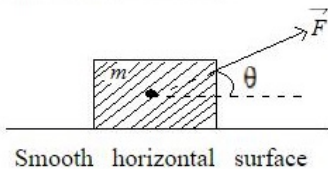
Question Type : SA
Question ID : 3666941197
Status : Not Answered

- Q.25** The wavelength of the radiation emitted is λ_0 when an electron jumps from the second excited state to the first excited state of hydrogen atom. If the electron jumps from the third excited state to the second orbit of the hydrogen atom, the wavelength of the radiation emitted will be $\frac{20}{x} \lambda_0$. The value of x is _____.

Given --
Answer :

Question Type : SA
Question ID : 3666941191
Status : Not Answered

- Q.26** An object of mass 'm' initially at rest on a smooth horizontal plane starts moving under the action of force $F = 2\text{N}$. In the process of its linear motion, the angle θ (as shown in figure) between the direction of force and horizontal varies as $\theta = kx$, where k is a constant and x is the distance covered by the object from its initial position. The expression of kinetic energy of the object will be $E = \frac{n}{k} \sin \theta$, The value of n is _____.



Given --
Answer :

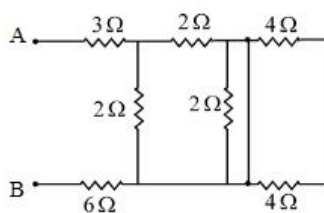
Question Type : SA
Question ID : 3666941199
Status : Not Answered

- Q.27** If $\vec{P} = 3\hat{i} + \sqrt{3}\hat{j} + 2\hat{k}$ and $\vec{Q} = 4\hat{i} + \sqrt{3}\hat{j} + 2.5\hat{k}$ then, The unit vector in the direction of $\vec{P} \times \vec{Q}$ is $\frac{1}{x}(\sqrt{3}\hat{i} + \hat{j} - 2\sqrt{3}\hat{k})$. The value of x is _____.

Given --
Answer :

Question Type : SA
Question ID : 3666941200
Status : Not Answered

Q.28 In the given circuit, the equivalent resistance between the terminal A and B is _____ Ω .



Given --
Answer :

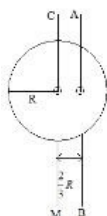
Question Type : SA
Question ID : 3666941194
Status : Not Answered

Q.29 The distance between two consecutive points with phase difference of 60° in a wave of frequency 500 Hz is 6.0 m. The velocity with which wave is traveling is _____ km/s

Given --
Answer :

Question Type : SA
Question ID : 3666941196
Status : Not Answered

Q.30 I_{CM} is the moment of inertia of a circular disc about an axis (CM) passing through its center and perpendicular to the plane of disc. I_{AB} is its moment of inertia about an axis AB perpendicular to plane and parallel to axis CM at a distance $\frac{2}{3}R$ from center. Where R is the radius of the disc. The ratio of I_{AB} and I_{CM} is $x : 9$. The value of x is _____.



Given --
Answer :

Question Type : SA
Question ID : 3666941198
Status : Not Answered

Section : Chemistry Section A

Q.31 The correct order in aqueous medium of basic strength in case of methyl substituted amines is :

- Options
1. $\text{Me}_3\text{N} > \text{Me}_2\text{NH} > \text{MeNH}_2 > \text{NH}_3$
 2. $\text{Me}_2\text{NH} > \text{Me}_3\text{N} > \text{MeNH}_2 > \text{NH}_3$
 3. $\text{NH}_3 > \text{Me}_3\text{N} > \text{MeNH}_2 > \text{Me}_2\text{NH}$
 4. $\text{Me}_2\text{NH} > \text{MeNH}_2 > \text{Me}_3\text{N} > \text{NH}_3$

Question Type : MCQ

Question ID : 3666941217

Option 1 ID : 3666943666

Option 2 ID : 3666943665

Option 3 ID : 3666943667

Option 4 ID : 3666943668

Status : Answered

Chosen Option : 4

Q.32 Inert gases have positive electron gain enthalpy. Its correct order is

- Options
1. $\text{He} < \text{Xe} < \text{Kr} < \text{Ne}$
 2. $\text{He} < \text{Ne} < \text{Kr} < \text{Xe}$
 3. $\text{He} < \text{Kr} < \text{Xe} < \text{Ne}$
 4. $\text{Xe} < \text{Kr} < \text{Ne} < \text{He}$

Question Type : MCQ

Question ID : 3666941204

Option 1 ID : 3666943616

Option 2 ID : 3666943613

Option 3 ID : 3666943615

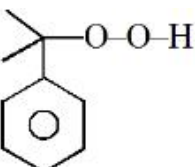
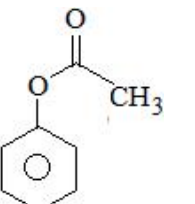
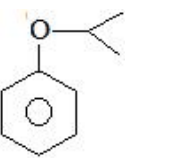
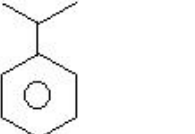
Option 4 ID : 3666943614

Status : Answered

Chosen Option : 4

Q.33 In the cumene to phenol preparation in presence of air, the intermediate is

Options

1. 
2. 
3. 
4. 

Question Type : MCQ

Question ID : 3666941214

Option 1 ID : 3666943655

Option 2 ID : 3666943654

Option 3 ID : 3666943656

Option 4 ID : 3666943653

Status : Answered

Chosen Option : 2

Q.34 Which of the following statements is incorrect for antibiotics?

Options 1.

- An antibiotic is a synthetic substance produced as a structural analogue of naturally occurring antibiotic.
2. An antibiotic should promote the growth or survival of microorganisms.
3. An antibiotic should be effective in low concentrations.
4. An antibiotic must be a product of metabolism.

Question Type : MCQ

Question ID : 3666941218

Option 1 ID : 3666943672

Option 2 ID : 3666943671

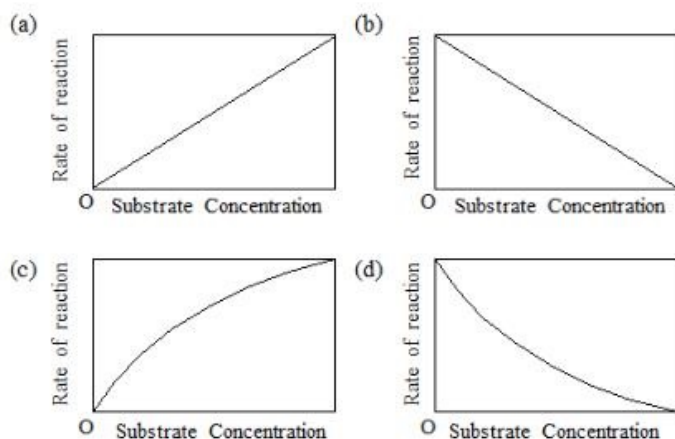
Option 3 ID : 3666943670

Option 4 ID : 3666943669

Status : Answered

Chosen Option : 2

Q.35 The variation of the rate of an enzyme catalyzed reaction with substrate concentration is correctly represented by graph



- Options 1. (a)
2. (d)
3. (c)
4. (b)

Question Type : MCQ

Question ID : 3666941203

Option 1 ID : 3666943609

Option 2 ID : 3666943612

Option 3 ID : 3666943611

Option 4 ID : 3666943610

Status : Answered

Chosen Option : 2

Q.36 Match List I with List II

LIST I		LIST II	
Elements		Colour imparted to the flame	
A.	K	I.	Brick Red
B.	Ca	II.	Violet
C.	Sr	III.	Apple Green
D.	Ba	IV.	Crimson Red

Choose the correct answer from the options given below:

- Options 1. A-II, B-IV, C-I, D-III
2. A-II, B-I, C-IV, D-III
3. A-IV, B-III, C-II, D-I
4. A-II, B-I, C-III, D-IV

Question Type : MCQ

Question ID : 3666941209

Option 1 ID : 3666943636

Option 2 ID : 3666943634

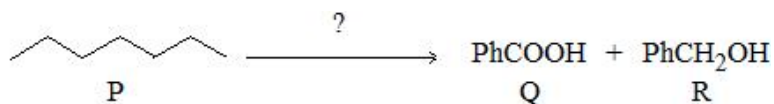
Option 3 ID : 3666943635

Option 4 ID : 3666943633

Status : Answered

Chosen Option : 1

Q.37



The correct sequence of reagents for the preparation of Q and R is :

Options

1. (i) $\text{CrO}_2\text{Cl}_2, \text{H}_3\text{O}^+$; (ii) $\text{Cr}_2\text{O}_3, 770 \text{ K}, 20 \text{ atm}$;
 (iii) NaOH ; (iv) H_3O^+
2. (i) $\text{KMnO}_4, \text{OH}^-$; (ii) $\text{Mo}_2\text{O}_3, \Delta$; (iii) NaOH ; (iv) H_3O^+
3. (i) $\text{Cr}_2\text{O}_3, 770 \text{ K}, 20 \text{ atm}$; (ii) $\text{CrO}_2\text{Cl}_2, \text{H}_3\text{O}^+$;
 (iii) NaOH ; (iv) H_3O^+
4. (i) $\text{Mo}_2\text{O}_3, \Delta$; (ii) $\text{CrO}_2\text{Cl}_2, \text{H}_3\text{O}^+$; (iii) NaOH ; (iv) H_3O^+

Question Type : MCQ

Question ID : 3666941212

Option 1 ID : 3666943646

Option 2 ID : 3666943645

Option 3 ID : 3666943648

Option 4 ID : 3666943647

Status : Answered

Chosen Option : 2

Q.38 Compound A reacts with NH_4Cl and forms a compound B. Compound B reacts with H_2O and excess of CO_2 to form compound C which on passing through or reaction with saturated NaCl solution forms sodium hydrogen carbonate. Compound A, B and C, are respectively.

Options

1. $\text{Ca}(\text{OH})_2, \text{NH}_4^+, (\text{NH}_4)_2\text{CO}_3$
2. $\text{Ca}(\text{OH})_2, \text{NH}_3, \text{NH}_4\text{HCO}_3$
3. $\text{CaCl}_2, \text{NH}_3, \text{NH}_4\text{HCO}_3$
4. $\text{CaCl}_2, \text{NH}_4^+, (\text{NH}_4)_2\text{CO}_3$

Question Type : MCQ

Question ID : 3666941207

Option 1 ID : 3666943626

Option 2 ID : 3666943628

Option 3 ID : 3666943625

Option 4 ID : 3666943627

Status : Answered

Chosen Option : 1

Q.39 The radius of the 2nd orbit of Li^{2+} is x . The expected radius of the 3rd orbit of Be^{3+} is

Options

1. $\frac{9}{4}x$
2. $\frac{27}{16}x$
3. $\frac{16}{27}x$
4. $\frac{4}{9}x$

Question Type : MCQ

Question ID : 3666941202

Option 1 ID : 3666943606

Option 2 ID : 3666943608

Option 3 ID : 3666943607

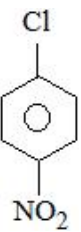
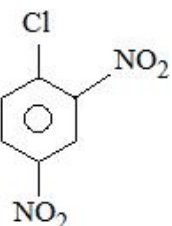
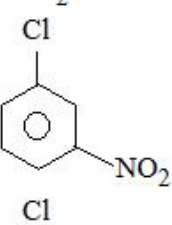
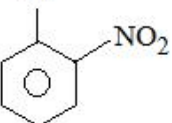
Option 4 ID : 3666943605

Status : Answered

Chosen Option : 3

Q.40 The compound which will have the lowest rate towards nucleophilic aromatic substitution on treatment with OH^- is

Options

1. 
2. 
3. 
4. 

Question Type : MCQ

Question ID : 3666941213

Option 1 ID : 3666943649

Option 2 ID : 3666943652

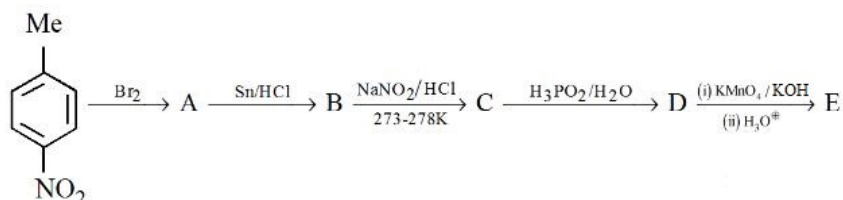
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Option 4 ID : 3666943650

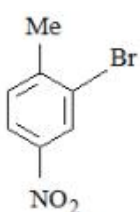
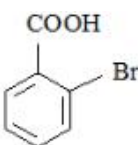
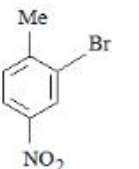
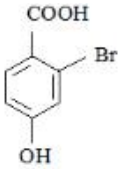
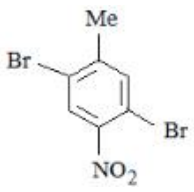
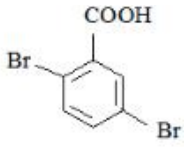
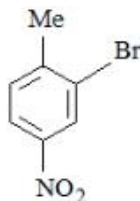
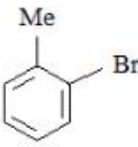
Status : Answered

Chosen Option : 3

Q.41 Identify the product formed (A and E)



Options

1. A = , E = 
2. A = , E = 
3. A = , E = 
4. A = , E = 

Question Type : MCQ

Question ID : 3666941216

Option 1 ID : 3666943663

Option 2 ID : 3666943664

Option 3 ID : 3666943661

Option 4 ID : 3666943662

Status : Answered

Chosen Option : 1

Q.42 Reaction of thionyl chloride with white phosphorus forms a compound [A], which on hydrolysis gives [B], a dibasic acid. [A] and [B] are respectively

- Options
1. PCl_3 and H_3PO_3
 2. P_4O_6 and H_3PO_3
 3. PCl_5 and H_3PO_4
 4. POCl_3 and H_3PO_4

Question Type : MCQ

Question ID : 3666941208

Option 1 ID : 3666943630

Option 2 ID : 3666943629

Option 3 ID : 3666943632

Option 4 ID : 3666943631

Status : Answered

Chosen Option : 4

Q.43 Given below are two statements : one is labelled as **Assertion A** and the other is labelled as **Reason R** :
Assertion A : Acetal / Ketal is stable in basic medium.
Reason R : The high leaving tendency of alkoxide ion gives the stability to acetal / ketal in basic medium.

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

- Options**
- Both A and R are true but R is NOT the correct explanation of A
 - Both A and R are true and R is the correct explanation of A
 - A is false but R is true
 - A is true but R is false

Question Type : MCQ

Question ID : 3666941215

Option 1 ID : 3666943658

Option 2 ID : 3666943657

Option 3 ID : 3666943660

Option 4 ID : 3666943659

Status : Answered

Chosen Option : 2

Q.44 '25 volume' hydrogen peroxide means

- Options**
- 1 L marketed solution contains 75 g of H_2O_2 .
 - 100 mL marketed solution contains 25 g of H_2O_2 .
 - 1 L marketed solution contains 250 g of H_2O_2 .
 - 1 L marketed solution contains 25 g of H_2O_2 .

Question Type : MCQ

Question ID : 3666941206

Option 1 ID : 3666943623

Option 2 ID : 3666943622

Option 3 ID : 3666943624

Option 4 ID : 3666943621

Status : Answered

Chosen Option : 2

Q.45 Which one of the following reactions does **not** occur during extraction of copper ?

- Options**
- $\text{CaO} + \text{SiO}_2 \rightarrow \text{CaSiO}_3$
 - $2 \text{FeS} + 3 \text{O}_2 \rightarrow 2 \text{FeO} + 2 \text{SO}_2$
 - $2 \text{Cu}_2\text{S} + 3 \text{O}_2 \rightarrow 2 \text{Cu}_2\text{O} + 2 \text{SO}_2$
 - $\text{FeO} + \text{SiO}_2 \rightarrow \text{FeSiO}_3$

Question Type : MCQ

Question ID : 3666941205

Option 1 ID : 3666943620

Option 2 ID : 3666943618

Option 3 ID : 3666943619

Option 4 ID : 3666943617

Status : Answered

Chosen Option : 1

Q.46 A cubic solid is made up of two elements X and Y. Atoms of X are present on every alternate corner and one at the center of cube. Y is at $\frac{1}{3}$ rd of the total faces. The empirical formula of the compound is

- Options 1. $X_2Y_{1.5}$
 2. $XY_{2.5}$
 3. $X_{2.5}Y$
 4. $X_{1.5}Y_2$

Question Type : MCQ

Question ID : 3666941201

Option 1 ID : 3666943603

Option 2 ID : 3666943601

Option 3 ID : 3666943602

Option 4 ID : 3666943604

Status : Answered

Chosen Option : 4

Q.47 Match the List-I with List-II :

List-I	List-II
Cations	Group reagents
A $\rightarrow$ Pb^{2+} , Cu^{2+}	i) H_2S gas in presence of dilute HCl
B $\rightarrow$ Al^{3+} , Fe^{3+}	ii) $(NH_4)_2CO_3$ in presence of NH_4OH
C $\rightarrow$ Co^{2+} , Ni^{2+}	iii) NH_4OH in presence of NH_4Cl
D $\rightarrow$ Ba^{2+} , Ca^{2+}	iv) H_2S in presence of NH_4OH

Correct match is –

- Options 1. A $\rightarrow$ iv, B $\rightarrow$ ii, C $\rightarrow$ iii, D $\rightarrow$ i
 2. A $\rightarrow$ i, B $\rightarrow$ iii, C $\rightarrow$ iv, D $\rightarrow$ ii
 3. A $\rightarrow$ iii, B $\rightarrow$ i, C $\rightarrow$ iv, D $\rightarrow$ ii
 4. A $\rightarrow$ i, B $\rightarrow$ iii, C $\rightarrow$ ii, D $\rightarrow$ iv

Question Type : MCQ

Question ID : 3666941220

Option 1 ID : 3666943680

Option 2 ID : 3666943677

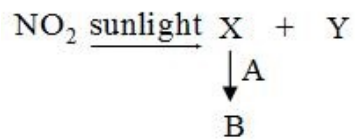
Option 3 ID : 3666943678

Option 4 ID : 3666943679

Status : Answered

Chosen Option : 3

Q.48 Some reactions of NO_2 relevant to photochemical smog formation are



Identify A, B, X and Y

- Options
1. $\text{X} = [\text{O}]$, $\text{Y} = \text{NO}$, $\text{A} = \text{O}_2$, $\text{B} = \text{O}_3$
 2. $\text{X} = \frac{1}{2}\text{O}_2$, $\text{Y} = \text{NO}_2$, $\text{A} = \text{O}_3$, $\text{B} = \text{O}_2$
 3. $\text{X} = \text{N}_2\text{O}$, $\text{Y} = [\text{O}]$, $\text{A} = \text{O}_3$, $\text{B} = \text{NO}$
 4. $\text{X} = \text{NO}$, $\text{Y} = [\text{O}]$, $\text{A} = \text{O}_2$, $\text{B} = \text{N}_2\text{O}_3$

Question Type : MCQ

Question ID : 3666941210

Option 1 ID : 3666943639

Option 2 ID : 3666943640

Option 3 ID : 3666943637

Option 4 ID : 3666943638

Status : Answered

Chosen Option : 3

Q.49 Which of the following conformations will be the most stable ?

Options

- 1.
- 2.
- 3.
- 4.

Question Type : MCQ

Question ID : 3666941211

Option 1 ID : 3666943643

Option 2 ID : 3666943644

Option 3 ID : 3666943641

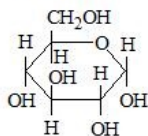
Option 4 ID : 3666943642

Status : Answered

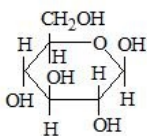
Chosen Option : 3

Q.50 Match items of Row I with those of Row II.

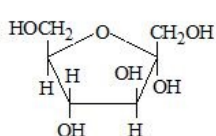
Row I :



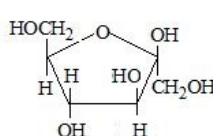
A



B



C



D

Row II :

(i) α -D-(-)-Fructofuranose,

(ii) β -D-(-)-

Fructofuranose

(iii) α -D-(-) Glucopyranose,

(iv) β -D-(-)-Glucopyranose

Correct match is

Options 1. A $\rightarrow$ i, B $\rightarrow$ ii, C $\rightarrow$ iii, D $\rightarrow$ iv

2. A $\rightarrow$ iv, B $\rightarrow$ iii, C $\rightarrow$ i, D $\rightarrow$ ii

3. A $\rightarrow$ iii, B $\rightarrow$ iv, C $\rightarrow$ i, D $\rightarrow$ ii

4. A $\rightarrow$ iii, B $\rightarrow$ iv, C $\rightarrow$ ii, D $\rightarrow$ i

Question Type : MCQ

Question ID : 3666941219

Option 1 ID : 3666943673

Option 2 ID : 3666943676

Option 3 ID : 3666943674

Option 4 ID : 3666943675

Status : Not Answered

Chosen Option : --

Section : Chemistry Section B

Q.51 How many of the following metal ions have similar value of spin only magnetic moment in gaseous state ? _____

(Given: Atomic number : V, 23; Cr, 24; Fe, 26; Ni, 28)

V^{3+} , Cr^{3+} , Fe^{2+} , Ni^{3+}

Given 2

Answer :

Question Type : SA

Question ID : 3666941228

Status : Answered

Q.52 An athlete is given 100 g of glucose ($C_6H_{12}O_6$) for energy. This is equivalent to 1800kJ of energy. The 50% of this energy gained is utilized by the athlete for sports activities at the event. In order to avoid storage of energy, the weight of extra water he would need to perspire is _____ g (Nearest integer)

Assume that there is no other way of consuming stored energy.

Given : The enthalpy of evaporation of water is 45 kJ mol^{-1}

Molar mass of C, H & O are 12, 1 and 16 g mol^{-1} .

Given --

Answer :

Question Type : SA

Question ID : 3666941223

Status : Not Answered

Q.53 The density of a monobasic strong acid (Molar mass 24.2 g/mol) is 1.21 kg/L. The volume of its solution required for the complete neutralization of 25 mL of 0.24 M NaOH is _____ $\times 10^{-2}$ mL (Nearest integer)

Given --
Answer :

Question Type : SA
Question ID : 3666941221
Status : Not Answered

Q.54 The total number of lone pairs of electrons on oxygen atoms of ozone is _____.

Given 1
Answer :

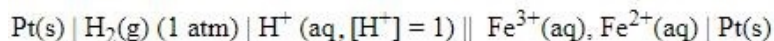
Question Type : SA
Question ID : 3666941222
Status : Answered

Q.55 In sulphur estimation, 0.471 g of an organic compound gave 1.4439 g of barium sulphate. The percentage of sulphur in the compound is _____ (Nearest Integer)
(Given: Atomic mass Ba: 137 u, S: 32 u, O: 16 u)

Given --
Answer :

Question Type : SA
Question ID : 3666941230
Status : Not Answered

Q.56 Consider the cell



Given $E^\circ_{\text{Fe}^{3+}/\text{Fe}^{2+}} = 0.771 \text{ V}$ and $E^\circ_{\text{H}^+/\frac{1}{2}\text{H}_2} = 0 \text{ V}$, $T = 298 \text{ K}$

If the potential of the cell is 0.712 V, the ratio of concentration of Fe^{2+} to Fe^{3+} is _____ (Nearest integer)

Given --
Answer :

Question Type : SA
Question ID : 3666941226
Status : Not Answered

Q.57 For the first order reaction $\text{A} \rightarrow \text{B}$, the half life is 30 min. The time taken for 75% completion of the reaction is _____ min. (Nearest integer)

Given : $\log 2 = 0.3010$

$\log 3 = 0.4771$

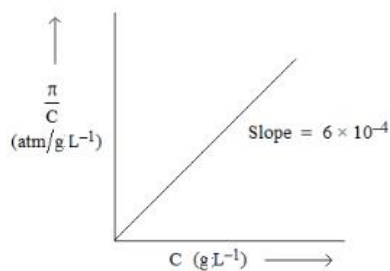
$\log 5 = 0.6989$

Given --
Answer :

Question Type : SA
Question ID : 3666941227
Status : Not Answered

Q.58 The osmotic pressure of solutions of PVC in cyclohexanone at 300 K are plotted on the graph.

The molar mass of PVC is _____ g mol^{-1} (Nearest integer)



(Given : $R = 0.083 \text{ L atm K}^{-1} \text{ mol}^{-1}$)

Given --
Answer :

Question Type : SA

Question ID : 3666941224

Status : Not Answered

Q.59 A litre of buffer solution contains 0.1 mole of each of NH_3 and NH_4Cl . On the addition of 0.02 mole of HCl by dissolving gaseous HCl , the pH of the solution is found to be _____ $\times 10^{-3}$ (Nearest integer)

[Given : $\text{p}K_b(\text{NH}_3) = 4.745$

$\log 2 = 0.301$

$\log 3 = 0.477$

$T = 298 \text{ K}$]

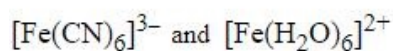
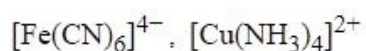
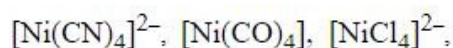
Given --
Answer :

Question Type : SA

Question ID : 3666941225

Status : Not Answered

Q.60 The number of paramagnetic species from the following is _____.



Given --
Answer :

Question Type : SA

Question ID : 3666941229

Status : Not Answered

Section : Mathematics Section A

Q.61 The distance of the point P (4, 6, -2) from the line passing through the point (-3, 2, 3) and parallel to a line with direction ratios 3, 3, -1 is equal to :

- Options 1. $2\sqrt{3}$
 2. 3
 3. $\sqrt{14}$
 4. $\sqrt{6}$

Question Type : MCQ

Question ID : 3666941245

Option 1 ID : 3666943747

Option 2 ID : 3666943748

Option 3 ID : 3666943750

Option 4 ID : 3666943749

Status : Not Answered

Chosen Option : --

Q.62 The mean and variance of the marks obtained by the students in a test are 10 and 4 respectively. Later, the marks of one of the students is increased from 8 to 12. If the new mean of the marks is 10.2, then their new variance is equal to :

- Options 1. 3.96
 2. 3.92
 3. 4.04
 4. 4.08

Question Type : MCQ

Question ID : 3666941247

Option 1 ID : 3666943758

Option 2 ID : 3666943755

Option 3 ID : 3666943756

Option 4 ID : 3666943757

Status : Answered

Chosen Option : 3

Q.63 The statement $(p \wedge (\sim q)) \Rightarrow (p \Rightarrow (\sim q))$ is

- Options 1. a contradiction
 2. equivalent to $p \vee q$
 3. a tautology
 4. equivalent to $(\sim p) \vee (\sim q)$

Question Type : MCQ

Question ID : 3666941250

Option 1 ID : 3666943770

Option 2 ID : 3666943767

Option 3 ID : 3666943769

Option 4 ID : 3666943768

Status : Answered

Chosen Option : 4

Q.64 Let S_1 and S_2 be respectively the sets of all $a \in \mathbb{R} - \{0\}$ for which the system of linear equations

$$ax + 2ay - 3az = 1$$

$$(2a + 1)x + (2a + 3)y + (a + 1)z = 2$$

$$(3a + 5)x + (a + 5)y + (a + 2)z = 3$$

has unique solution and infinitely many solutions. Then

Options 1. $n(S_1) = 2$ and S_2 is an infinite set

2. $S_1 = \mathbb{R} - \{0\}$ and $S_2 = \Phi$

3. S_1 is an infinite set and $n(S_2) = 2$

4. $S_1 = \Phi$ and $S_2 = \mathbb{R} - \{0\}$

Question Type : MCQ

Question ID : 3666941232

Option 1 ID : 3666943697

Option 2 ID : 3666943695

Option 3 ID : 3666943698

Option 4 ID : 3666943696

Status : Not Answered

Chosen Option : --

Q.65

Let $x, y, z > 1$ and $A = \begin{bmatrix} 1 & \log_x y & \log_x z \\ \log_y x & 2 & \log_y z \\ \log_z x & \log_z y & 3 \end{bmatrix}$. Then $|\text{adj}(\text{adj } A^2)|$ is equal to

Options 1. 4^8

2. 2^4

3. 2^8

4. 6^4

Question Type : MCQ

Question ID : 3666941233

Option 1 ID : 3666943701

Option 2 ID : 3666943699

Option 3 ID : 3666943700

Option 4 ID : 3666943702

Status : Not Answered

Chosen Option : --

Q.66 Let $x = 2$ be a local minima of the function $f(x) = 2x^4 - 18x^2 + 8x + 12$, $x \in (-4, 4)$. If M is local maximum value of the function f in $(-4, 4)$, then $M =$

Options

1. $18\sqrt{6} - \frac{33}{2}$
2. $12\sqrt{6} - \frac{31}{2}$
3. $18\sqrt{6} - \frac{31}{2}$
4. $12\sqrt{6} - \frac{33}{2}$

Question Type : MCQ

Question ID : 3666941237

Option 1 ID : 3666943715

Option 2 ID : 3666943716

Option 3 ID : 3666943718

Option 4 ID : 3666943717

Status : Not Answered

Chosen Option : --

Q.67 Let $f(x) = \int \frac{2x}{(x^2+1)(x^2+3)} dx$. If $f(3) = \frac{1}{2}(\log_e 5 - \log_e 6)$, then $f(4)$ is equal to

Options 1. $\log_e 17 - \log_e 18$

2. $\frac{1}{2}(\log_e 19 - \log_e 17)$

3. $\frac{1}{2}(\log_e 17 - \log_e 19)$

4. $\log_e 19 - \log_e 20$

Question Type : MCQ

Question ID : 3666941239

Option 1 ID : 3666943726

Option 2 ID : 3666943724

Option 3 ID : 3666943725

Option 4 ID : 3666943723

Status : Not Answered

Chosen Option : --

Q.68 The vector $\vec{a} = -\hat{i} + 2\hat{j} + \hat{k}$ is rotated through a right angle, passing through the y-axis in its way and the resulting vector is $\vec{b}$. Then the projection of $3\vec{a} + \sqrt{2}\vec{b}$ on $\vec{c} = 5\hat{i} + 4\hat{j} + 3\hat{k}$ is :

Options 1. $2\sqrt{3}$

2. $3\sqrt{2}$

3. 1

4. $\sqrt{6}$

Question Type : MCQ

Question ID : 3666941246

Option 1 ID : 3666943754

Option 2 ID : 3666943753

Option 3 ID : 3666943751

Option 4 ID : 3666943752

Status : Not Answered

Chosen Option : --

Q.69 The points of intersection of the line $ax + by = 0$, ($a \neq b$) and the circle $x^2 + y^2 - 2x = 0$ are A ($\alpha, 0$) and B ($1, \beta$). The image of the circle with AB as a diameter in the line $x + y + 2 = 0$ is :

- Options**
1. $x^2 + y^2 + 3x + 5y + 8 = 0$
 2. $x^2 + y^2 - 5x - 5y + 12 = 0$
 3. $x^2 + y^2 + 3x + 3y + 4 = 0$
 4. $x^2 + y^2 + 5x + 5y + 12 = 0$

Question Type : **MCQ**

Question ID : **3666941244**

Option 1 ID : **3666943745**

Option 2 ID : **3666943743**

Option 3 ID : **3666943746**

Option 4 ID : **3666943744**

Status : **Not Answered**

Chosen Option : --

Q.70

Let $f : (0, 1) \rightarrow \mathbb{R}$ be a function defined by $f(x) = \frac{1}{1 - e^{-x}}$, and

$g(x) = (f(-x) - f(x))$. Consider two statements

(I) g is an increasing function in $(0, 1)$

(II) g is one-one in $(0, 1)$

Then,

- Options**
1. Only (II) is true
 2. Both (I) and (II) are true
 3. Only (I) is true
 4. Neither (I) nor (II) is true

Question Type : **MCQ**

Question ID : **3666941243**

Option 1 ID : **3666943740**

Option 2 ID : **3666943741**

Option 3 ID : **3666943739**

Option 4 ID : **3666943742**

Status : **Not Answered**

Chosen Option : --

Q.71 Let $y(x) = (1 + x)(1 + x^2)(1 + x^4)(1 + x^8)(1 + x^{16})$. Then $y' - y''$ at $x = -1$ is equal to :

- Options**
1. 976
 2. 464
 3. 496
 4. 944

Question Type : **MCQ**

Question ID : **3666941238**

Option 1 ID : **3666943721**

Option 2 ID : **3666943720**

Option 3 ID : **3666943719**

Option 4 ID : **3666943722**

Status : **Not Answered**

Chosen Option : --

Q.72 Let M be the maximum value of the product of two positive integers when their sum is 66. Let the sample space $S = \left\{x \in \mathbb{Z} : x(66-x) \geq \frac{5}{9}M\right\}$ and the event $A = \{x \in S : x \text{ is a multiple of } 3\}$. Then $P(A)$ is equal to

- Options
1. $\frac{7}{22}$
 2. $\frac{15}{44}$
 3. $\frac{1}{5}$
 4. $\frac{1}{3}$

Question Type : **MCQ**

Question ID : **3666941248**

Option 1 ID : **3666943760**

Option 2 ID : **3666943759**

Option 3 ID : **3666943761**

Option 4 ID : **3666943762**

Status : **Not Answered**

Chosen Option : --

Q.73 The distance of the point $(6, -2\sqrt{2})$ from the common tangent $y = mx + c$, $m > 0$, of the curves $x = 2y^2$ and $x = 1 + y^2$ is :

- Options
1. $\frac{14}{3}$
 2. $\frac{1}{3}$
 3. $5\sqrt{3}$
 4. 5

Question Type : **MCQ**

Question ID : **3666941242**

Option 1 ID : **3666943737**

Option 2 ID : **3666943735**

Option 3 ID : **3666943738**

Option 4 ID : **3666943736**

Status : **Not Answered**

Chosen Option : --

Q.74 Consider the lines L_1 and L_2 given by

$$L_1: \frac{x-1}{2} = \frac{y-3}{1} = \frac{z-2}{2}$$

$$L_2: \frac{x-2}{1} = \frac{y-2}{2} = \frac{z-3}{3}$$

A line L_3 having direction ratios 1, -1, -2, intersects L_1 and L_2 at the points P and Q respectively. Then the length of line segment PQ is

- Options
1. $2\sqrt{6}$
 2. 4
 3. $3\sqrt{2}$
 4. $4\sqrt{3}$

Question Type : MCQ

Question ID : 3666941236

Option 1 ID : 3666943711

Option 2 ID : 3666943714

Option 3 ID : 3666943713

Option 4 ID : 3666943712

Status : Not Answered

Chosen Option : --

Q.75 The value of $\lim_{n \rightarrow \infty} \frac{1+2+3+4+5+6+\dots+(3n-2)+(3n-1)-3n}{\sqrt{2n^4+4n+3}-\sqrt{n^4+5n+4}}$ is :

- Options
1. $\frac{\sqrt{2}+1}{2}$
 2. $3(\sqrt{2}+1)$
 3. $\frac{3}{2\sqrt{2}}$
 4. $\frac{3}{2}(\sqrt{2}+1)$

Question Type : MCQ

Question ID : 3666941235

Option 1 ID : 3666943707

Option 2 ID : 3666943710

Option 3 ID : 3666943708

Option 4 ID : 3666943709

Status : Not Answered

Chosen Option : --

Q.76 Let $y = y(x)$ be the solution curve of the differential equation

$$\frac{dy}{dx} = \frac{y}{x} \left(1 + xy^2(1 + \log_e x) \right), x > 0, y(1) = 3. \text{ Then } \frac{y^2(x)}{9} \text{ is equal to :}$$

Options

1. $\frac{x^2}{7 - 3x^3(2 + \log_e x^2)}$
2. $\frac{x^2}{5 - 2x^3(2 + \log_e x^3)}$
3. $\frac{x^2}{3x^3(1 + \log_e x^2) - 2}$
4. $\frac{x^2}{2x^3(2 + \log_e x^3) - 3}$

Question Type : MCQ

Question ID : 3666941241

Option 1 ID : 3666943732

Option 2 ID : 3666943731

Option 3 ID : 3666943733

Option 4 ID : 3666943734

Status : Not Answered

Chosen Option : --

Q.77 If a_r is the coefficient of x^{10-r} in the Binomial expansion of $(1+x)^{10}$, then

$$\sum_{r=1}^{10} r^3 \left(\frac{a_r}{a_{r-1}} \right)^2 \text{ is equal to}$$

Options

1. 1210
2. 5445
3. 3025
4. 4895

Question Type : MCQ

Question ID : 3666941234

Option 1 ID : 3666943706

Option 2 ID : 3666943703

Option 3 ID : 3666943705

Option 4 ID : 3666943704

Status : Not Answered

Chosen Option : --

Q.78 Let $z_1 = 2 + 3i$ and $z_2 = 3 + 4i$. The set

$$S = \left\{ z \in \mathbb{C} : |z - z_1|^2 - |z - z_2|^2 = |z_1 - z_2|^2 \right\} \text{ represents a}$$

Options 1.

straight line with the sum of its intercepts on the coordinate axes equals 14

2.

straight line with the sum of its intercepts on the coordinate axes equals -18

3. hyperbola with eccentricity 2

4. hyperbola with the length of the transverse axis 7

Question Type : MCQ

Question ID : 3666941231

Option 1 ID : 3666943692

Option 2 ID : 3666943694

Option 3 ID : 3666943691

Option 4 ID : 3666943693

Status : Answered

Chosen Option : 2

Q.79

Let $\vec{a}$, $\vec{b}$ and $\vec{c}$ be three non zero vectors such that $\vec{b} \cdot \vec{c} = 0$ and $\vec{a} \times (\vec{b} \times \vec{c}) = \frac{\vec{b} - \vec{c}}{2}$.

If $\vec{d}$ be a vector such that $\vec{b} \cdot \vec{d} = \vec{a} \cdot \vec{b}$, then $(\vec{a} \times \vec{b}) \cdot (\vec{c} \times \vec{d})$ is equal to

Options

1. $\frac{3}{4}$

2. $\frac{1}{4}$

3. $-\frac{1}{4}$

4. $\frac{1}{2}$

Question Type : MCQ

Question ID : 3666941249

Option 1 ID : 3666943766

Option 2 ID : 3666943763

Option 3 ID : 3666943765

Option 4 ID : 3666943764

Status : Not Answered

Chosen Option : --

Q.80

The minimum value of the function $f(x) = \int_0^2 e^{|x-t|} dt$ is :

- Options 1. $2e - 1$
 2. 2
 3. $2(e - 1)$
 4. $e(e - 1)$

Question Type : MCQ

Question ID : 3666941240

Option 1 ID : 3666943727

Option 2 ID : 3666943730

Option 3 ID : 3666943729

Option 4 ID : 3666943728

Status : Not Answered

Chosen Option : --

Section : Mathematics Section B

Q.81 Let x and y be distinct integers where $1 \leq x \leq 25$ and $1 \leq y \leq 25$. Then, the number of ways of choosing x and y , such that $x + y$ is divisible by 5, is _____.

Given --
 Answer :

Question Type : SA

Question ID : 3666941257

Status : Not Answered

Q.82 Let $S = \left\{ \alpha : \log_2(9^{2\alpha-4} + 13) - \log_2\left(\frac{5}{2} \cdot 3^{2\alpha-4} + 1\right) = 2 \right\}$. Then the maximum value of β for which the equation $x^2 - 2\left(\sum_{\alpha \in S} \alpha\right)x + \sum_{\alpha \in S} (\alpha + 1)^2 \beta = 0$ has real roots, is _____.

Given --
 Answer :

Question Type : SA

Question ID : 3666941252

Status : Not Answered

Q.83 It the area enclosed by the parabolas $P_1 : 2y = 5x^2$ and $P_2 : x^2 - y + 6 = 0$ is equal to the area enclosed by P_1 and $y = ax$, $a > 0$, then a^3 is equal to _____.

Given --
 Answer :

Question Type : SA

Question ID : 3666941258

Status : Not Answered

Q.84 Let the equation of the plane passing through the line $x - 2y - z - 5 = 0 = x + y + 3z - 5$ and parallel to the line $x + y + 2z - 7 = 0 = 2x + 3y + z - 2$ be $ax + by + cz = 65$. Then the distance of the point (a, b, c) from the plane $2x + 2y - z + 16 = 0$ is _____

Given --
Answer :

Question Type : SA
Question ID : 3666941259
Status : Not Answered

Q.85 The constant term in the expansion of $\left(2x + \frac{1}{x^7} + 3x^2\right)^5$ is _____.

Given --
Answer :

Question Type : SA
Question ID : 3666941254
Status : Not Answered

Q.86 The vertices of a hyperbola H are $(\pm 6, 0)$ and its eccentricity is $\frac{\sqrt{5}}{2}$. Let N be the normal to H at a point in the first quadrant and parallel to the line $\sqrt{2}x + y = 2\sqrt{2}$. If d is the length of the line segment of N between H and the y-axis then d^2 is equal to _____.

Given --
Answer :

Question Type : SA
Question ID : 3666941256
Status : Not Answered

Q.87 If the sum of all the solutions of $\tan^{-1}\left(\frac{2x}{1-x^2}\right) + \cot^{-1}\left(\frac{1-x^2}{2x}\right) = \frac{\pi}{3}$, $-1 < x < 1$, $x \neq 0$, is $\alpha - \frac{4}{\sqrt{3}}$, then α is equal to _____.

Given --
Answer :

Question Type : SA
Question ID : 3666941260
Status : Not Answered

Q.88 Let $S = \{1, 2, 3, 5, 7, 10, 11\}$. The number of non-empty subsets of S that have the sum of all elements a multiple of 3, is _____.

Given --
Answer :

Question Type : SA
Question ID : 3666941253
Status : Not Answered

Q.89 Let A_1, A_2, A_3 be the three A.P. with the same common difference d and having their first terms as $A, A+1, A+2$, respectively. Let a, b, c be the 7th, 9th, 17th terms

of A_1, A_2, A_3 , respectively such that $\begin{vmatrix} a & 7 & 1 \\ 2b & 17 & 1 \\ c & 17 & 1 \end{vmatrix} + 70 = 0$.

If $a = 29$, then the sum of first 20 terms of an AP whose first term is $c-a-b$ and common difference is $\frac{d}{12}$, is equal to _____.

Given --
Answer :

Question Type : SA
Question ID : 3666941255
Status : Not Answered

Q.90 For some $a, b, c \in \mathbb{N}$, let $f(x) = ax - 3$ and $g(x) = x^b + c, x \in \mathbb{R}$. If

$(fog)^{-1}(x) = \left(\frac{x-7}{2}\right)^{1/3}$, then $(fog)(ac) + (gof)(b)$ is equal to _____.

Given --
Answer :

Question Type : SA
Question ID : 3666941251
Status : Not Answered