

JEE MAIN 2019

Application No	
Candidate Name	
Roll No.	
Test Date	11/01/2019
Test Time	9:30 AM - 12:30 PM
Subject	Paper I EH

Section : Physics

Q.1 A body is projected at $t=0$ with a velocity 10 ms^{-1} at an angle of 60° with the horizontal. The radius of curvature of its trajectory at $t=1\text{s}$ is R . Neglecting air resistance and taking acceleration due to gravity $g=10 \text{ ms}^{-2}$, the value of R is :

- Options**
- 1. 10.3 m
 - 2. 2.8 m
 - 3. 2.5 m
 - 4. 5.1 m

Question ID : 4165299148

Option 1 ID : 41652936053

Option 2 ID : 41652936052

Option 3 ID : 41652936050

Option 4 ID : 41652936051

Status : Not Answered

Chosen Option : --

Q.2 A hydrogen atom, initially in the ground state is excited by absorbing a photon of wavelength 980\AA . The radius of the atom in the excited state, in terms of Bohr radius a_0 , will be :
 $(hc = 12500 \text{ eV-\AA})$

- Options**
- 1. $25a_0$
 - 2. $9a_0$
 - 3. $16a_0$
 - 4. $4a_0$

Question ID : 4165299171

Option 1 ID : 41652936145

Option 2 ID : 41652936143

Option 3 ID : 41652936144

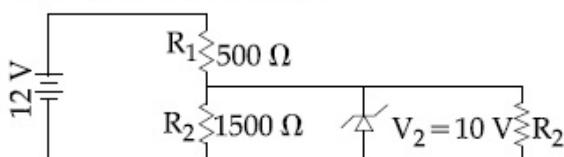
Option 4 ID : 41652936142

Status : Not Answered

Chosen Option : --

Q.3

In the given circuit the current through Zener Diode is close to :



- Options
1. 0.0 mA
 2. 6.7 mA
 3. 4.0 mA
 4. 6.0 mA

Question ID : 4165299172

Option 1 ID : 41652936148

Option 2 ID : 41652936146

Option 3 ID : 41652936147

Option 4 ID : 41652936149

Status : Answered

Chosen Option : 2

Q.4 There are two long co-axial solenoids of same length l . The inner and outer coils have radii r_1 and r_2 and number of turns per unit length n_1 and n_2 , respectively. The ratio of mutual inductance to the self-inductance of the inner-coil is :

Options

1. $\frac{n_1}{n_2}$
2. $\frac{n_2}{n_1} \cdot \frac{r_1}{r_2}$
3. $\frac{n_2}{n_1} \cdot \frac{r_2^2}{r_1^2}$
4. $\frac{n_2}{n_1}$

Question ID : 4165299165

Option 1 ID : 41652936121

Option 2 ID : 41652936120

Option 3 ID : 41652936119

Option 4 ID : 41652936118

Status : Not Answered

Chosen Option : --

Q.5 A particle undergoing simple harmonic motion has time dependent displacement

given by $x(t) = A \sin \frac{\pi t}{90}$. The ratio of kinetic to potential energy of this particle at $t = 210\text{ s}$ will be :

Options

1. $\frac{1}{9}$
2. 1

3. 2

4. 3

Question ID : 4165299157

Option 1 ID : 41652936088

Option 2 ID : 41652936086

Option 3 ID : 41652936089

Option 4 ID : 41652936087

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.6

A satellite is revolving in a circular orbit at a height h from the earth surface, such that $h \ll R$ where R is the radius of the earth. Assuming that the effect of earth's atmosphere can be neglected the minimum increase in the speed required so that the satellite could escape from the gravitational field of earth is :

Options

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

Question ID : 4165299153

Option 1 ID : 41652936071

Option 2 ID : 41652936070

Option 3 ID : 41652936073

Option 4 ID : 41652936072

Status : Answered

Chosen Option : 1

Q.7

The force of interaction between two atoms

is given by $F = \alpha\beta \exp\left(-\frac{x^2}{\alpha kT}\right)$; where x

is the distance, k is the Boltzmann constant and T is temperature and α and β are two constants. The dimension of β is :

Options

1. $M^0 L^2 T^{-4}$
2. $M^2 L T^{-4}$
3. $M L T^{-2}$
4. $M^2 L^2 T^{-2}$

Question ID : 4165299146

Option 1 ID : 41652936044

Option 2 ID : 41652936045

Option 3 ID : 41652936042

Option 4 ID : 41652936043

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.8

In a Young's double slit experiment, the path difference, at a certain point on the screen, between two interfering waves is

$\frac{1}{8}$ th of wavelength. The ratio of the

intensity at this point to that at the centre of a bright fringe is close to :

Options 1. 0.74

2. 0.85

3. 0.94

4. 0.80

Question ID : 4165299169

Option 1 ID : 41652936134

Option 2 ID : 41652936136

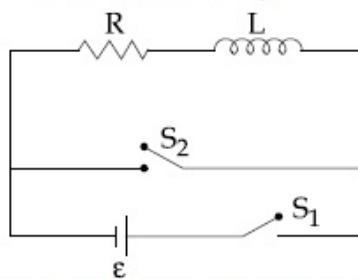
Option 3 ID : 41652936137

Option 4 ID : 41652936135

Status : Not Answered

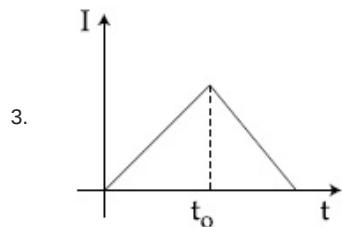
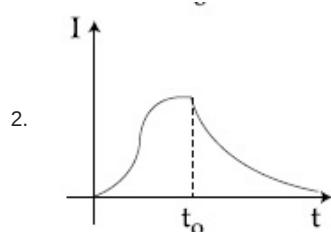
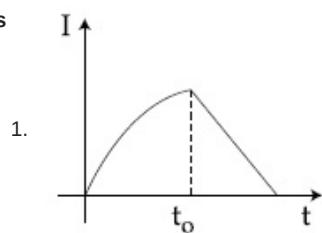
Chosen Option : --

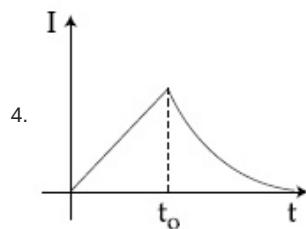
Q.9 In the circuit shown,



the switch S_1 is closed at time $t = 0$ and the switch S_2 is kept open. At some later time(t_0), the switch S_1 is opened and S_2 is closed. The behaviour of the current I as a function of time ' t ' is given by :

Options





Question ID : 4165299166

Option 1 ID : 41652936125

Option 2 ID : 41652936123

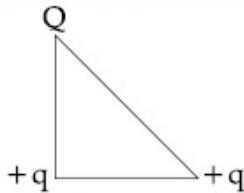
Option 3 ID : 41652936124

Option 4 ID : 41652936122

Status : Answered

Chosen Option : 4

- Q.10** Three charges Q , $+q$ and $+q$ are placed at the vertices of a right-angle isosceles triangle as shown below. The net electrostatic energy of the configuration is zero, if the value of Q is :



Options

1. $+q$
2. $\frac{-\sqrt{2}q}{\sqrt{2}+1}$
3. $\frac{-q}{1+\sqrt{2}}$
4. $-2q$

Question ID : 4165299160

Option 1 ID : 41652936101

Option 2 ID : 41652936099

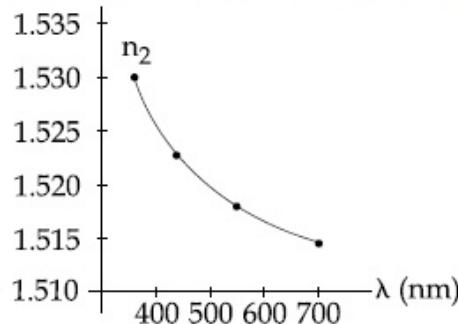
Option 3 ID : 41652936098

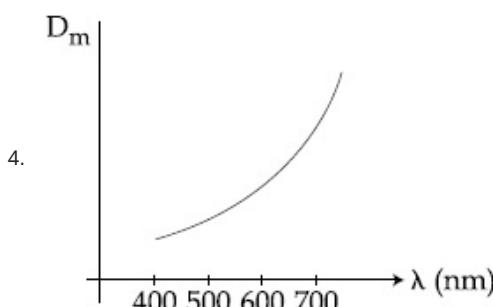
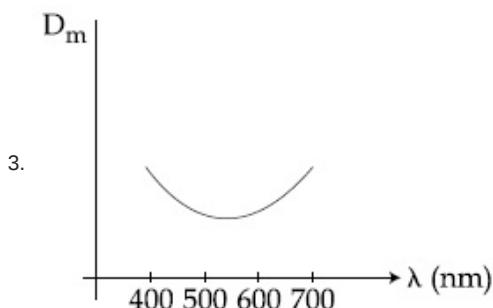
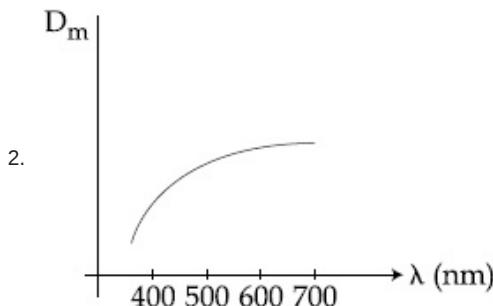
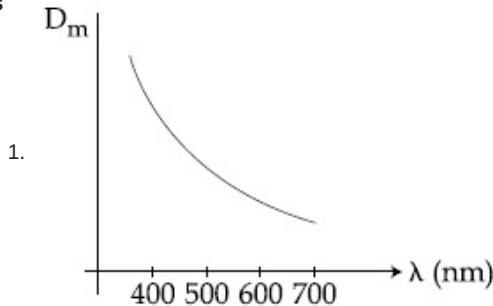
Option 4 ID : 41652936100

Status : Not Answered

Chosen Option : --

- Q.11** The variation of refractive index of a crown glass thin prism with wavelength of the incident light is shown. Which of the following graphs is the correct one, if D_m is the angle of minimum deviation ?

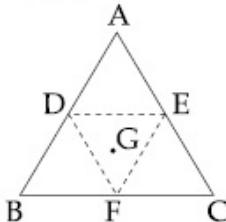


OptionsQuestion ID : **4165299174**Option 1 ID : **41652936154**Option 2 ID : **41652936156**Option 3 ID : **41652936157**Option 4 ID : **41652936155**Status : **Not Answered**

Chosen Option : --

Q.12

An equilateral triangle ABC is cut from a thin solid sheet of wood. (See figure) D, E and F are the mid-points of its sides as shown and G is the centre of the triangle. The moment of inertia of the triangle about an axis passing through G and perpendicular to the plane of the triangle is I_0 . If the smaller triangle DEF is removed from ABC, the moment of inertia of the remaining figure about the same axis is I. Then :



Options

1. $I = \frac{15}{16}I_0$
2. $I = \frac{3}{4}I_0$
3. $I = \frac{9}{16}I_0$
4. $I = \frac{I_0}{4}$

Question ID : 4165299152

Option 1 ID : 41652936069

Option 2 ID : 41652936067

Option 3 ID : 41652936068

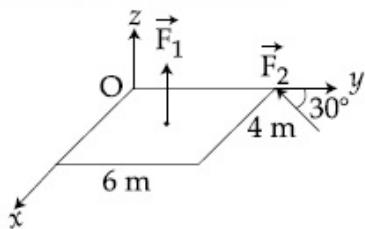
Option 4 ID : 41652936066

Status : Answered

Chosen Option : 2

Q.13

A slab is subjected to two forces \vec{F}_1 and \vec{F}_2 of same magnitude F as shown in the figure. Force \vec{F}_2 is in XY-plane while force \vec{F}_1 acts along z-axis at the point $(2\vec{i} + 3\vec{j})$. The moment of these forces about point O will be :



Options

1. $\left(3\hat{i} - 2\hat{j} + 3\hat{k} \right) F$
2. $\left(3\hat{i} - 2\hat{j} - 3\hat{k} \right) F$
3. $\left(3\hat{i} + 2\hat{j} - 3\hat{k} \right) F$
4. $\left(3\hat{i} + 2\hat{j} + 3\hat{k} \right) F$

Question ID : 4165299151
 Option 1 ID : 41652936063
 Option 2 ID : 41652936065
 Option 3 ID : 41652936062
 Option 4 ID : 41652936064

Status : Not Answered

Chosen Option : --

- Q.14** Ice at -20°C is added to 50 g of water at 40°C . When the temperature of the mixture reaches 0°C , it is found that 20 g of ice is still unmelted. The amount of ice added to the water was close to
 (Specific heat of water = $4.2 \text{ J/g}/^{\circ}\text{C}$
 Specific heat of Ice = $2.1 \text{ J/g}/^{\circ}\text{C}$
 Heat of fusion of water at 0°C = 334 J/g)

- Options**
1. 50 g
 2. 100 g
 3. 60 g
 4. 40 g

Question ID : 4165299154
 Option 1 ID : 41652936076
 Option 2 ID : 41652936077
 Option 3 ID : 41652936074
 Option 4 ID : 41652936075

Status : Not Attempted and Marked For Review

Chosen Option : --

- Q.15** A particle is moving along a circular path with a constant speed of 10 ms^{-1} . What is the magnitude of the change in velocity of the particle, when it moves through an angle of 60° around the centre of the circle ?

- Options**
1. $10\sqrt{3} \text{ m/s}$
 2. zero
 3. $10\sqrt{2} \text{ m/s}$
 4. 10 m/s

Question ID : 4165299147
 Option 1 ID : 41652936047

Option 2 ID : 41652936046

Option 3 ID : 41652936048

Option 4 ID : 41652936049

Status : Answered

Chosen Option : 2

- Q.16** An amplitude modulated signal is given by $V(t) = 10[1 + 0.3\cos(2.2 \times 10^4 t)]\sin(5.5 \times 10^5 t)$. Here t is in seconds. The sideband frequencies (in kHz) are, [Given $\pi = 22/7$]

Options 1. 1785 and 1715

2. 178.5 and 171.5
3. 89.25 and 85.75
4. 892.5 and 857.5

Question ID : 4165299173

Option 1 ID : 41652936153

Option 2 ID : 41652936152

Option 3 ID : 41652936151

Option 4 ID : 41652936150

Status : Not Answered

Chosen Option : --

- Q.17** An object is at a distance of 20 m from a convex lens of focal length 0.3 m. The lens forms an image of the object. If the object moves away from the lens at a speed of 5 m/s, the speed and direction of the image will be :

Options 1. 2.26×10^{-3} m/s away from the lens

2. 0.92×10^{-3} m/s away from the lens

3. 3.22×10^{-3} m/s towards the lens

4. 1.16×10^{-3} m/s towards the lens

Question ID : 4165299168

Option 1 ID : 41652936130

Option 2 ID : 41652936133

Option 3 ID : 41652936132

Option 4 ID : 41652936131

Status : Answered

Chosen Option : 2

- Q.18** A gas mixture consists of 3 moles of oxygen and 5 moles of argon at temperature T. Considering only translational and rotational modes, the total internal energy of the system is :

Options 1. 15 RT

2. 12 RT

3. 4 RT

4. 20 RT

Question ID : 4165299156

Option 1 ID : 41652936084

Option 2 ID : 41652936083

Option 3 ID : 41652936082

Option 4 ID : 41652936085

Status : Answered

Chosen Option : 1

Q.19 Two equal resistances when connected in series to a battery, consume electric power of 60 W. If these resistances are now connected in parallel combination to the same battery, the electric power consumed will be :

- Options 1. 60 W
 2. 240 W
 3. 120 W
 4. 30 W

Question ID : 4165299162

Option 1 ID : 41652936106

Option 2 ID : 41652936107

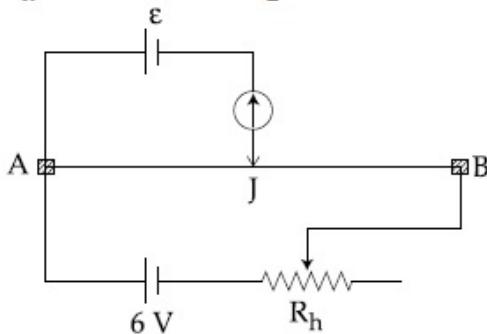
Option 3 ID : 41652936108

Option 4 ID : 41652936109

Status : Answered

Chosen Option : 2

Q.20 The resistance of the meter bridge AB in given figure is 4Ω . With a cell of emf $\varepsilon = 0.5 \text{ V}$ and rheostat resistance $R_h = 2 \Omega$ the null point is obtained at some point J. When the cell is replaced by another one of emf $\varepsilon = \varepsilon_2$ the same null point J is found for $R_h = 6 \Omega$. The emf ε_2 is :



- Options 1. 0.4 V
 2. 0.3 V
 3. 0.6 V
 4. 0.5 V

Question ID : 4165299175

Option 1 ID : 41652936160

Option 2 ID : 41652936158

Option 3 ID : 41652936161

Option 4 ID : 41652936159

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.21

An electromagnetic wave of intensity 50 Wm^{-2} enters in a medium of refractive index 'n' without any loss. The ratio of the magnitudes of electric fields, and the ratio of the magnitudes of magnetic fields of the wave before and after entering into the medium are respectively, given by :

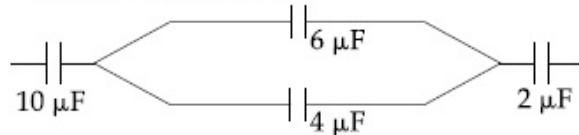
Options

1. $\left(\frac{1}{\sqrt{n}}, \frac{1}{\sqrt{n}} \right)$
2. (\sqrt{n}, \sqrt{n})
3. $\left(\sqrt{n}, \frac{1}{\sqrt{n}} \right)$
4. $\left(\frac{1}{\sqrt{n}}, \sqrt{n} \right)$

Question ID : 4165299167
 Option 1 ID : 41652936129
 Option 2 ID : 41652936128
 Option 3 ID : 41652936127
 Option 4 ID : 41652936126
 Status : Not Answered
 Chosen Option : --

Q.22

In the figure shown below, the charge on the left plate of the $10 \mu\text{F}$ capacitor is $-30 \mu\text{C}$. The charge on the right plate of the $6 \mu\text{F}$ capacitor is :



- Options
1. $-12 \mu\text{C}$
 2. $+12 \mu\text{C}$
 3. $-18 \mu\text{C}$
 4. $+18 \mu\text{C}$

Question ID : 4165299159
 Option 1 ID : 41652936097
 Option 2 ID : 41652936096
 Option 3 ID : 41652936095
 Option 4 ID : 41652936094
 Status : Answered
 Chosen Option : 3

Q.23

A rigid diatomic ideal gas undergoes an adiabatic process at room temperature. The relation between temperature and volume for this process is $TV^x = \text{constant}$, then x is :

Options

1. $\frac{3}{5}$

2. $\frac{2}{5}$

3. $\frac{2}{3}$

4. $\frac{5}{3}$

Question ID : 4165299155

Option 1 ID : 41652936081

Option 2 ID : 41652936079

Option 3 ID : 41652936078

Option 4 ID : 41652936080

Status : Answered

Chosen Option : 1

- Q.24** A liquid of density ρ is coming out of a hose pipe of radius a with horizontal speed v and hits a mesh. 50% of the liquid passes through the mesh unaffected. 25% loses all of its momentum and 25% comes back with the same speed. The resultant pressure on the mesh will be :

Options

1. $\frac{1}{4}\rho v^2$

2. $\frac{3}{4}\rho v^2$

3. $\frac{1}{2}\rho v^2$

4. ρv^2

Question ID : 4165299149

Option 1 ID : 41652936054

Option 2 ID : 41652936056

Option 3 ID : 41652936055

Option 4 ID : 41652936057

Status : Not Answered

Chosen Option : --

- Q.25** If the deBroglie wavelength of an electron is equal to 10^{-3} times the wavelength of a photon of frequency 6×10^{14} Hz, then the speed of electron is equal to :
 (Speed of light = 3×10^8 m/s
 Planck's constant = 6.63×10^{-34} J.s
 Mass of electron = 9.1×10^{-31} kg)

Options

1. 1.1×10^6 m/s

2. 1.7×10^6 m/s

3. 1.8×10^6 m/s

4. 1.45×10^6 m/s

Question ID : 4165299170

Option 1 ID : 41652936140

Option 2 ID : 41652936141

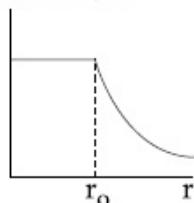
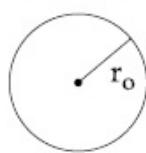
Option 3 ID : 41652936138

Option 4 ID : 41652936139

Status : Not Answered

Chosen Option : --

- Q.26** The given graph shows variation (with distance r from centre) of :



- Options**
1. Electric field of a uniformly charged sphere
 2. Potential of a uniformly charged spherical shell
 3. Potential of a uniformly charged sphere
 4. Electric field of a uniformly charged spherical shell

Question ID : 4165299161

Option 1 ID : 41652936105

Option 2 ID : 41652936102

Option 3 ID : 41652936103

Option 4 ID : 41652936104

Status : Answered

Chosen Option : 2

- Q.27** Equation of travelling wave on a stretched string of linear density 5 g/m is $y = 0.03 \sin(450 t - 9x)$ where distance and time are measured in SI units. The tension in the string is :

- Options**
1. 10 N
 2. 7.5 N
 3. 12.5 N
 4. 5 N

Question ID : 4165299158

Option 1 ID : 41652936092

Option 2 ID : 41652936091

Option 3 ID : 41652936093

Option 4 ID : 41652936090

Status : Answered

Chosen Option : 3

- Q.28** In an experiment, electrons are accelerated, from rest, by applying a voltage of 500 V. Calculate the radius of the path if a magnetic field 100 mT is then applied.
[Charge of the electron = 1.6×10^{-19} C
Mass of the electron = 9.1×10^{-31} kg]

- Options**
1. 7.5×10^{-3} m

2. $7.5 \times 10^{-2} \text{ m}$
3. 7.5 m
4. $7.5 \times 10^{-4} \text{ m}$

Question ID : 4165299164

Option 1 ID : 41652936117

Option 2 ID : 41652936115

Option 3 ID : 41652936114

Option 4 ID : 41652936116

Status : Not Answered

Chosen Option : --

Q.29 A body of mass 1 kg falls freely from a height of 100 m, on a platform of mass 3 kg which is mounted on a spring having spring constant $k = 1.25 \times 10^6 \text{ N/m}$. The body sticks to the platform and the spring's maximum compression is found to be x . Given that $g = 10 \text{ ms}^{-2}$, the value of x will be close to :

Options

1. 40 cm
2. 4 cm
3. 80 cm
4. 8 cm

Question ID : 4165299150

Option 1 ID : 41652936060

Option 2 ID : 41652936058

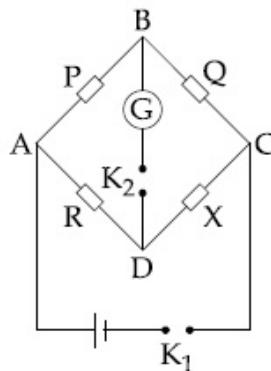
Option 3 ID : 41652936061

Option 4 ID : 41652936059

Status : Not Answered

Chosen Option : --

Q.30 In a Wheatstone bridge(see fig.), Resistances P and Q are approximately equal. When $R = 400 \Omega$, the bridge is balanced. On interchanging P and Q, the value of R, for balance, is 405Ω . The value of X is close to :

**Options**

1. 401.5 ohm
2. 404.5 ohm
3. 403.5 ohm
4. 402.5 ohm

Question ID : 4165299163

Option 1 ID : 41652936110

Option 2 ID : 41652936111

Option 3 ID : 41652936113

Option 4 ID : 41652936112

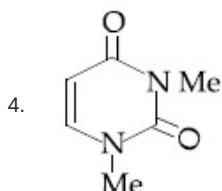
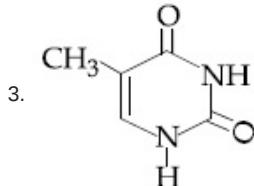
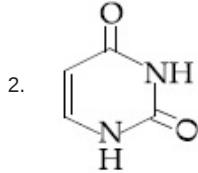
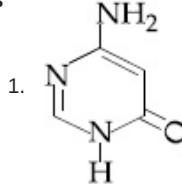
Status : Answered

Chosen Option : 2

Section : Chemistry

Q.1 Among the following compounds, which one is found in RNA ?

Options



Question ID : 4165299176

Option 1 ID : 41652936163

Option 2 ID : 41652936162

Option 3 ID : 41652936164

Option 4 ID : 41652936165

Status : Not Answered

Chosen Option : --

Q.2

The correct match between items I and II is :

Item - I (Mixture)	Item - II (Separation method)
(A) H ₂ O : Sugar	(P) Sublimation
(B) H ₂ O : Aniline	(Q) Recrystallization
(C) H ₂ O : Toluene	(R) Steam distillation
	(S) Differential extraction

Options 1. (A)→(S); (B)→(R); (C)→(P)

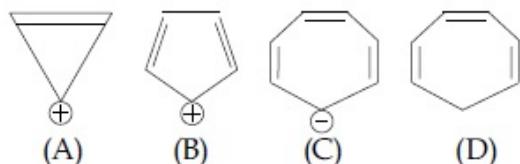
2. (A)→(Q); (B)→(R); (C)→(S)

3. (A)→(R); (B)→(P); (C)→(S)

4. (A)→(Q); (B)→(R); (C)→(P)

Question ID : 4165299183
 Option 1 ID : 41652936191
 Option 2 ID : 41652936192
 Option 3 ID : 41652936190
 Option 4 ID : 41652936193
 Status : Answered
 Chosen Option : 2

Q.3 Which compound (s) out of the following is/are not aromatic ?



- Options
1. (B), (C) and (D)
 2. (C) and (D)
 3. (B)
 4. (A) and (C)

Question ID : 4165299181
 Option 1 ID : 41652936184
 Option 2 ID : 41652936185
 Option 3 ID : 41652936182
 Option 4 ID : 41652936183
 Status : Answered
 Chosen Option : 1

Q.4 A solid having density of $9 \times 10^3 \text{ kg m}^{-3}$ forms face centred cubic crystals of edge length $200\sqrt{2} \text{ pm}$. What is the molar mass of the solid ?

[Avogadro constant $\approx 6 \times 10^{23} \text{ mol}^{-1}$, $\pi \approx 3$]

- Options
1. $0.0432 \text{ kg mol}^{-1}$
 2. $0.0216 \text{ kg mol}^{-1}$
 3. $0.0305 \text{ kg mol}^{-1}$
 4. $0.4320 \text{ kg mol}^{-1}$

Question ID : 4165299197
 Option 1 ID : 41652936246
 Option 2 ID : 41652936248
 Option 3 ID : 41652936249
 Option 4 ID : 41652936247
 Status : Answered
 Chosen Option : 3

Q.5

For the cell $\text{Zn(s)}|\text{Zn}^{2+}(\text{aq})||\text{M}^{x+}(\text{aq})|\text{M(s)}$, different half cells and their standard electrode potentials are given below :

$\text{M}^{x+}(\text{aq})/\text{M(s)}$	$\text{Au}^{3+}(\text{aq})/\text{Au(s)}$	$\text{Ag}^+(\text{aq})/\text{Ag(s)}$	$\text{Fe}^{3+}(\text{aq})/\text{Fe}^{2+}(\text{aq})$	$\text{Fe}^{2+}(\text{aq})/\text{Fe(s)}$
$E^\circ_{\text{M}^{x+}/\text{M}}/(\text{V})$	1.40	0.80	0.77	-0.44

If $E^\circ_{\text{Zn}^{2+}/\text{Zn}} = -0.76 \text{ V}$, which cathode will give a maximum value of E°_{cell} per electron transferred ?

- Options
1. Ag^+/Ag
 2. $\text{Fe}^{3+}/\text{Fe}^{2+}$
 3. Au^{3+}/Au
 4. Fe^{2+}/Fe

Question ID : 4165299203

Option 1 ID : 41652936271

Option 2 ID : 41652936272

Option 3 ID : 41652936270

Option 4 ID : 41652936273

Status : Answered

Chosen Option : 4

- Q.6 The correct match between item (I) and item (II) is :

Item - I	Item - II
(A) Norethindrone	(P) Anti-biotic
(B) Ofloxacin	(Q) Anti-fertility
(C) Equanil	(R) Hypertension
	(S) Analgesics

- Options
1. (A)→(Q); (B)→(R); (C)→(S)
 2. (A)→(Q); (B)→(P); (C)→(R)
 3. (A)→(R); (B)→(P); (C)→(S)
 4. (A)→(R); (B)→(P); (C)→(R)

Question ID : 4165299184

Option 1 ID : 41652936196

Option 2 ID : 41652936197

Option 3 ID : 41652936194

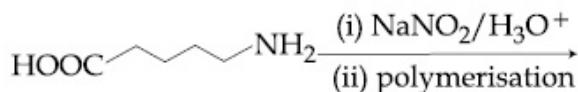
Option 4 ID : 41652936195

Status : Answered

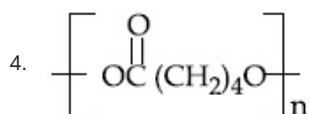
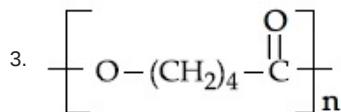
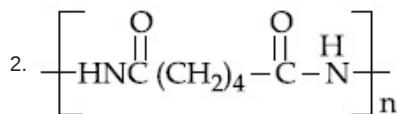
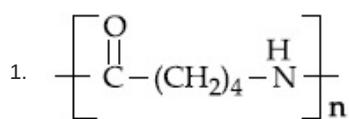
Chosen Option : 2

- Q.7

The polymer obtained from the following reactions is :



- Options



Question ID : 4165299177

Option 1 ID : 41652936169

Option 2 ID : 41652936167

Option 3 ID : 41652936168

Option 4 ID : 41652936166

Status : Answered

Chosen Option : 1

Q.8 NaH is an example of :

Options

- 1. electron-rich hydride
- 2. metallic hydride
- 3. saline hydride
- 4. molecular hydride

Question ID : 4165299188

Option 1 ID : 41652936213

Option 2 ID : 41652936210

Option 3 ID : 41652936212

Option 4 ID : 41652936211

Status : Answered

Chosen Option : 2

Q.9 The element that usually does NOT show variable oxidation states is :

Options

- 1. Cu
- 2. Ti
- 3. Sc
- 4. V

Question ID : 4165299192

Option 1 ID : 41652936227

Option 2 ID : 41652936228

Option 3 ID : 41652936226

Option 4 ID : 41652936229

Status : Answered

Chosen Option : 3

Q.10 An example of solid sol is :

Options

1. Paint
2. Gem stones
3. Butter
4. Hair cream

Question ID : 4165299205

Option 1 ID : 41652936279

Option 2 ID : 41652936278

Option 3 ID : 41652936280

Option 4 ID : 41652936281

Status : Answered

Chosen Option : 3

Q.11 The concentration of dissolved oxygen (DO) in cold water can go upto :

Options

1. 14 ppm
2. 8 ppm
3. 10 ppm
4. 16 ppm

Question ID : 4165299194

Option 1 ID : 41652936236

Option 2 ID : 41652936234

Option 3 ID : 41652936235

Option 4 ID : 41652936237

Status : Answered

Chosen Option : 4

Q.12 The correct statements among (a) to (d) regarding H₂ as a fuel are :

- (a) It produces less pollutants than petrol.
- (b) A cylinder of compressed dihydrogen weighs ~30 times more than a petrol tank producing the same amount of energy.
- (c) Dihydrogen is stored in tanks of metal alloys like NaNi₅.
- (d) On combustion, values of energy released per gram of liquid dihydrogen and LPG are 50 and 142 kJ, respectively.

Options

1. (b) and (d) only
2. (a) and (c) only
3. (b), (c) and (d) only
4. (a), (b) and (c) only

Question ID : 4165299189

Option 1 ID : 41652936216

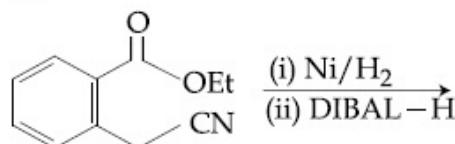
Option 2 ID : 41652936214

Option 3 ID : 41652936215

Option 4 ID : 41652936217

Status : Answered

Q.13 The major product of the following reaction is :



Options

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

Question ID : 4165299182

Option 1 ID : 41652936186

Option 2 ID : 41652936188

Option 3 ID : 41652936189

Option 4 ID : 41652936187

Status : Answered

Chosen Option : 2

Q.14

The freezing point of a diluted milk sample is found to be -0.2°C , while it should have been -0.5°C for pure milk. How much water has been added to pure milk to make the diluted sample ?

- Options
1. 1 cup of water to 2 cups of pure milk
 2. 3 cups of water to 2 cups of pure milk
 3. 1 cup of water to 3 cups of pure milk
 4. 2 cups of water to 3 cups of pure milk

Question ID : 4165299201

Option 1 ID : 41652936262

Option 2 ID : 41652936264

Option 3 ID : 41652936265

Option 4 ID : 41652936263

Status : Answered

Chosen Option : 2

Q.15

If a reaction follows the Arrhenius equation, the plot $\ln k$ vs $1/(RT)$ gives straight line with a gradient ($-y$) unit. The energy required to activate the reactant is :

Options

1. y/R unit
2. y unit
3. yR unit
4. $-y$ unit

Question ID : 4165299204

Option 1 ID : 41652936277

Option 2 ID : 41652936275

Option 3 ID : 41652936274

Option 4 ID : 41652936276

Status : Answered

Chosen Option : 4

Q.16 A 10 mg effervescent tablet containing sodium bicarbonate and oxalic acid releases 0.25 ml of CO_2 at $T = 298.15\text{ K}$ and $p = 1\text{ bar}$. If molar volume of CO_2 is 25.0 L under such condition, what is the percentage of sodium bicarbonate in each tablet ?

[Molar mass of $\text{NaHCO}_3 = 84\text{ g mol}^{-1}$]

Options

1. 0.84
2. 33.6
3. 16.8
4. 8.4

Question ID : 4165299196

Option 1 ID : 41652936243

Option 2 ID : 41652936245

Option 3 ID : 41652936244

Option 4 ID : 41652936242

Status : Answered

Chosen Option : 4

Q.17 The amphoteric hydroxide is :

Options

1. Be(OH)_2
2. Ca(OH)_2
3. Mg(OH)_2
4. Sr(OH)_2

Question ID : 4165299190

Option 1 ID : 41652936218

Option 2 ID : 41652936220

Option 3 ID : 41652936219

Option 4 ID : 41652936221

Status : Answered

Chosen Option : 1

Q.18 Peroxyacetyl nitrate (PAN), an eye irritant is produced by :

Options 1. classical smog

2. acid rain

3. organic waste

4. photochemical smog

Question ID : 4165299195

Option 1 ID : 41652936241

Option 2 ID : 41652936238

Option 3 ID : 41652936239

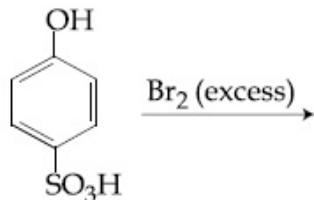
Option 4 ID : 41652936240

Status : Answered

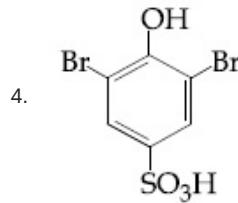
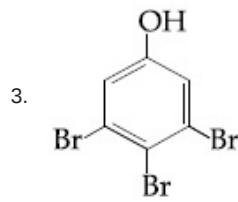
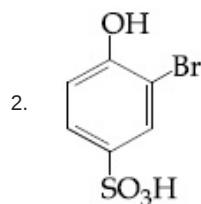
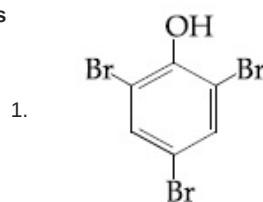
Chosen Option : 4

Q.19

The major product of the following reaction is :



Options



Question ID : 4165299179

Option 1 ID : 41652936177

Option 2 ID : 41652936175

Option 3 ID : 41652936176

Option 4 ID : 41652936174

Status : Answered

Q.20 An organic compound is estimated through Dumas method and was found to evolve 6 moles of CO_2 , 4 moles of H_2O and 1 mole of nitrogen gas. The formula of the compound is :

- Options
1. $\text{C}_{12}\text{H}_8\text{N}$
 2. $\text{C}_{12}\text{H}_8\text{N}_2$
 3. $\text{C}_6\text{H}_8\text{N}_2$
 4. $\text{C}_6\text{H}_8\text{N}$

Question ID : 4165299185

Option 1 ID : 41652936199

Option 2 ID : 41652936198

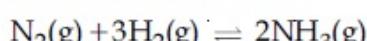
Option 3 ID : 41652936200

Option 4 ID : 41652936201

Status : Answered

Chosen Option : 3

Q.21 Consider the reaction



The equilibrium constant of the above reaction is K_p . If pure ammonia is left to dissociate, the partial pressure of ammonia at equilibrium is given by (Assume that

$$P_{\text{NH}_3} \ll P_{\text{total}} \text{ at equilibrium}$$

- Options

$$1. \frac{3^{\frac{3}{2}} K_p^{\frac{1}{2}} P^2}{16}$$

$$2. \frac{K_p^{\frac{1}{2}} P^2}{16}$$

$$3. \frac{K_p^{\frac{1}{2}} P^2}{4}$$

$$4. \frac{3^{\frac{3}{2}} K_p^{\frac{1}{2}} P^2}{4}$$

Question ID : 4165299202

Option 1 ID : 41652936269

Option 2 ID : 41652936266

Option 3 ID : 41652936268

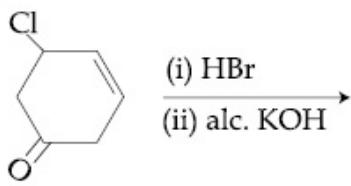
Option 4 ID : 41652936267

Status : Not Attempted and Marked For Review

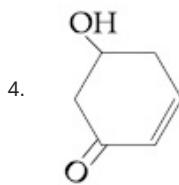
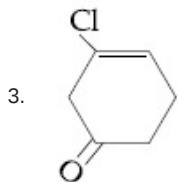
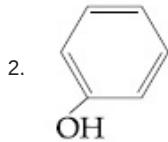
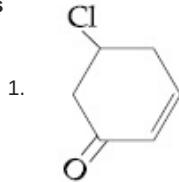
Chosen Option : --

Q.22

The major product of the following reaction is :



Options



Question ID : **4165299180**

Option 1 ID : **41652936179**

Option 2 ID : **41652936180**

Option 3 ID : **41652936181**

Option 4 ID : **41652936178**

Status : **Answered**

Chosen Option : **1**

Q.23 Two blocks of the same metal having same mass and at temperature T_1 and T_2 , respectively, are brought in contact with each other and allowed to attain thermal equilibrium at constant pressure. The change in entropy, ΔS , for this process is :

Options

1. $C_p \ln \left[\frac{(T_1 + T_2)^2}{4T_1 T_2} \right]$

2. $2C_p \ln \left[\frac{(T_1 + T_2)^{\frac{1}{2}}}{T_1 T_2} \right]$

3. $2C_p \ln \left(\frac{T_1 + T_2}{4T_1 T_2} \right)$

$$4. \quad 2C_p \ln \left[\frac{T_1 + T_2}{2T_1 T_2} \right]$$

Question ID : 4165299200

Option 1 ID : 41652936259

Option 2 ID : 41652936261

Option 3 ID : 41652936258

Option 4 ID : 41652936260

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.24

Match the metals (**column I**) with the coordination compound(s)/enzyme(s) (**column II**):

(**column I**) (**column II**)

Metals	Coordination compound(s)/enzyme(s)
---------------	-------------------------------------------

- | | |
|--------|-------------------------------|
| (A) Co | (i) Wilkinson catalyst |
| (B) Zn | (ii) Chlorophyll |
| (C) Rh | (iii) Vitamin B ₁₂ |
| (D) Mg | (iv) Carbonic anhydrase |

Options 1. (A)-(iii); (B)-(iv); (C)-(i); (D)-(ii)

2. (A)-(i); (B)-(ii); (C)-(iii); (D)-(iv)

3. (A)-(ii); (B)-(i); (C)-(iv); (D)-(iii)

4. (A)-(iv); (B)-(iii); (C)-(i); (D)-(ii)

Question ID : 4165299193

Option 1 ID : 41652936233

Option 2 ID : 41652936232

Option 3 ID : 41652936230

Option 4 ID : 41652936231

Status : Marked For Review

Chosen Option : 1

Q.25

For the chemical reaction $X = Y$, the standard reaction Gibbs energy depends on temperature T (in K) as

$$\Delta_r G^\circ \text{ (in kJ mol}^{-1}\text{)} = 120 - \frac{3}{8} T.$$

The major component of the reaction mixture at T is :

Options 1. Y if T = 300 K

2. Y if T = 280 K

3. X if T = 350 K

4. X if T = 315 K

Question ID : 4165299199

Option 1 ID : 41652936255

Option 2 ID : 41652936257

Option 3 ID : 41652936254

Option 4 ID : 41652936256

Status : Answered

Q.26 Match the ores (**column A**) with the metals (**column B**) :

(Column A)	(Column B)
Ores	Metals
(I) Siderite	(a) Zinc
(II) Kaolinite	(b) Copper
(III) Malachite	(c) Iron
(IV) Calamine	(d) Aluminium

Options 1. (I) - (a); (II) - (b); (III) - (c); (IV) - (d)

2. (I) - (c); (II) - (d); (III) - (b); (IV) - (a)

3. (I) - (c); (II) - (d); (III) - (a); (IV) - (b)

4. (I) - (b); (II) - (c); (III) - (d); (IV) - (a)

Question ID : 4165299187

Option 1 ID : 41652936206

Option 2 ID : 41652936207

Option 3 ID : 41652936209

Option 4 ID : 41652936208

Status : Answered

Chosen Option : 2

Q.27 Heat treatment of muscular pain involves radiation of wavelength of about 900 nm. Which spectral line of H-atom is suitable for this purpose ?

$$[R_H = 1 \times 10^5 \text{ cm}^{-1}, h = 6.6 \times 10^{-34} \text{ Js}, c = 3 \times 10^8 \text{ ms}^{-1}]$$

Options 1. Paschen, $\infty \rightarrow 3$

2. Paschen, $5 \rightarrow 3$

3. Balmer, $\infty \rightarrow 2$

4. Lyman, $\infty \rightarrow 1$

Question ID : 4165299198

Option 1 ID : 41652936253

Option 2 ID : 41652936252

Option 3 ID : 41652936251

Option 4 ID : 41652936250

Status : Answered

Chosen Option : 1

Q.28 The chloride that CANNOT get hydrolysed is :

Options 1. PbCl_4

2. CCl_4

3. SnCl_4

4. SiCl_4

Question ID : 4165299191

Option 1 ID : 41652936225

Option 2 ID : 41652936222

Option 3 ID : 41652936224

Option 4 ID : 41652936223

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.29 The correct order of the atomic radii of C, Cs, Al, and S is :

Options 1. $C < S < Al < Cs$

2. $S < C < Cs < Al$

3. $S < C < Al < Cs$

4. $C < S < Cs < Al$

Question ID : 4165299186

Option 1 ID : 41652936203

Option 2 ID : 41652936202

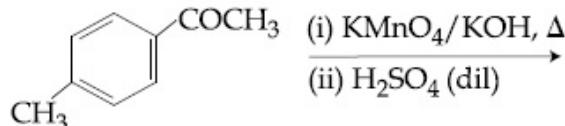
Option 3 ID : 41652936205

Option 4 ID : 41652936204

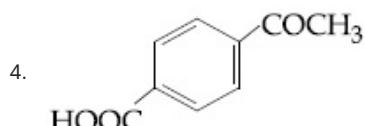
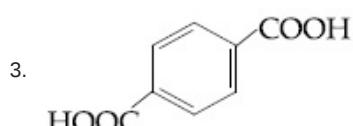
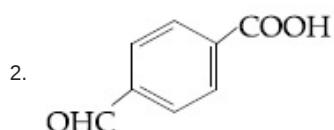
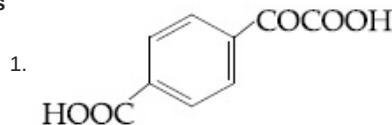
Status : Answered

Chosen Option : 1

Q.30 The major product of the following reaction is



Options



Question ID : 4165299178

Option 1 ID : 41652936170

Option 2 ID : 41652936172

Option 3 ID : 41652936171

Option 4 ID : 41652936173

Status : Answered

Chosen Option : 2

Section : Mathematics

Q.1

If the system of linear equations

$$2x + 2y + 3z = a$$

$$3x - y + 5z = b$$

$$x - 3y + 2z = c$$

where a, b, c are non-zero real numbers, has more than one solution, then :

Options 1. $b - c + a = 0$

2. $b - c - a = 0$

3. $a + b + c = 0$

4. $b + c - a = 0$

Question ID : 4165299210

Option 1 ID : 41652936299

Option 2 ID : 41652936300

Option 3 ID : 41652936301

Option 4 ID : 41652936298

Status : Not Answered

Chosen Option : --

Q.2

Let $f_k(x) = \frac{1}{k}(\sin^k x + \cos^k x)$ for

$k = 1, 2, 3, \dots$. Then for all $x \in \mathbb{R}$, the value of $f_4(x) - f_6(x)$ is equal to :

Options

1. $\frac{1}{12}$

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

3. $\frac{-1}{12}$

4. $\frac{5}{12}$

Question ID : 4165299233

Option 1 ID : 41652936390

Option 2 ID : 41652936392

Option 3 ID : 41652936391

Option 4 ID : 41652936393

Status : Answered

Chosen Option : 1

Q.3

A square is inscribed in the circle $x^2 + y^2 - 6x + 8y - 103 = 0$ with its sides parallel to the coordinate axes. Then the distance of the vertex of this square which is nearest to the origin is :

Options 1. 6

2. $\sqrt{137}$

3. $\sqrt{41}$

4. 13

Question ID : 4165299225
 Option 1 ID : 41652936358
 Option 2 ID : 41652936361
 Option 3 ID : 41652936359
 Option 4 ID : 41652936360
 Status : Answered
 Chosen Option : 1

Q.4 If q is false and $p \wedge q \leftrightarrow r$ is true, then which one of the following statements is a tautology ?

- Options
1. $(p \vee r) \rightarrow (p \wedge r)$
 2. $(p \wedge r) \rightarrow (p \vee r)$
 3. $p \wedge r$
 4. $p \vee r$

Question ID : 4165299235
 Option 1 ID : 41652936401
 Option 2 ID : 41652936400
 Option 3 ID : 41652936398
 Option 4 ID : 41652936399
 Status : Answered
 Chosen Option : 2

Q.5 The area (in sq.units) of the region bounded by the curve $x^2=4y$ and the straight line $x=4y-2$ is :

- Options
1. $\frac{5}{4}$
 2. $\frac{9}{8}$
 3. $\frac{7}{8}$
 4. $\frac{3}{4}$

Question ID : 4165299221
 Option 1 ID : 41652936344
 Option 2 ID : 41652936343
 Option 3 ID : 41652936345
 Option 4 ID : 41652936342
 Status : Answered
 Chosen Option : 2

Q.6

The value of the integral
$$\int_{-2}^2 \frac{\sin^2 x}{\left[\frac{x}{\pi} \right] + \frac{1}{2}} dx$$

(where $[x]$ denotes the greatest integer less than or equal to x) is :

Options

1. 0
2. $\sin 4$
3. 4
4. $4 - \sin 4$

Question ID : 4165299220

Option 1 ID : 41652936339

Option 2 ID : 41652936341

Option 3 ID : 41652936340

Option 4 ID : 41652936338

Status : Answered

Chosen Option : 4

Q.7 The outcome of each of 30 items was observed ; 10 items gave an outcome

$\frac{1}{2} - d$ each, 10 items gave outcome

$\frac{1}{2}$ each and the remaining 10 items gave

outcome $\frac{1}{2} + d$ each. If the variance of this

outcome data is $\frac{4}{3}$ then $|d|$ equals :

Options

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

Question ID : 4165299231

Option 1 ID : 41652936385

Option 2 ID : 41652936383

Option 3 ID : 41652936384

Option 4 ID : 41652936382

Status : Answered

Chosen Option : 4

Q.8 The plane containing the line

$$\frac{x-3}{2} = \frac{y+2}{-1} = \frac{z-1}{3} \quad \text{and also}$$

containing its projection on the plane $2x+3y-z=5$, contains which one of the following points ?

Options

1. (2, 2, 0)
2. (-2, 2, 2)
3. (0, -2, 2)
4. (2, 0, -2)

Question ID : 4165299229

Option 1 ID : 41652936376

Option 2 ID : 41652936377

Option 3 ID : 41652936374

Option 4 ID : 41652936375

Status : Not Attempted and Marked For Review

Chosen Option : --

- Q.9** Two integers are selected at random from the set {1, 2, ..., 11}. Given that the sum of selected numbers is even, the conditional probability that both the numbers are even is :

Options

1. $\frac{7}{10}$

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

3. $\frac{2}{5}$

4. $\frac{3}{5}$

Question ID : 4165299232

Option 1 ID : 41652936389

Option 2 ID : 41652936387

Option 3 ID : 41652936386

Option 4 ID : 41652936388

Status : Not Answered

Chosen Option : --

- Q.10** Two circles with equal radii are intersecting at the points (0, 1) and (0, -1). The tangent at the point (0, 1) to one of the circles passes through the centre of the other circle. Then the distance between the centres of these circles is :

Options

1. 1

2. 2

3. $2\sqrt{2}$ 4. $\sqrt{2}$

Question ID : 4165299223

Option 1 ID : 41652936351

Option 2 ID : 41652936352

Option 3 ID : 41652936350

Option 4 ID : 41652936353

Status : Answered

Chosen Option : 2

- Q.11** The value of r for which ${}^{20}C_0 {}^{20}C_0 + {}^{20}C_{r-1} {}^{20}C_1 + {}^{20}C_{r-2} {}^{20}C_2 + \dots + {}^{20}C_0 {}^{20}C_r$ is maximum, is :

Options 1. 15

2. 20

3. 11

4. 10

Question ID : 4165299214

Option 1 ID : 41652936315

Option 2 ID : 41652936317

Option 3 ID : 41652936314

Option 4 ID : 41652936316

Status : Answered

Chosen Option : 4

Q.12 If tangents are drawn to the ellipse $x^2 + 2y^2 = 2$ at all points on the ellipse other than its four vertices then the mid points of the tangents intercepted between the coordinate axes lie on the curve :

Options

$$1. \frac{1}{4x^2} + \frac{1}{2y^2} = 1$$

$$2. \frac{x^2}{4} + \frac{y^2}{2} = 1$$

$$3. \frac{1}{2x^2} + \frac{1}{4y^2} = 1$$

$$4. \frac{x^2}{2} + \frac{y^2}{4} = 1$$

Question ID : 4165299227

Option 1 ID : 41652936367

Option 2 ID : 41652936369

Option 3 ID : 41652936366

Option 4 ID : 41652936368

Status : Answered

Chosen Option : 3

Q.13

Let $f(x) = \begin{cases} -1, & -2 \leq x < 0 \\ x^2 - 1, & 0 \leq x \leq 2 \end{cases}$ and

$g(x) = |f(x)| + f(|x|)$. Then, in the interval $(-2, 2)$, g is :

Options

1. differentiable at all points

2. not continuous

3. not differentiable at two points

4. not differentiable at one point

Question ID : 4165299217

Option 1 ID : 41652936329

Option 2 ID : 41652936326

Option 3 ID : 41652936328

Option 4 ID : 41652936327

Status : Answered

Chosen Option : 3

Q.14 If $x \log_e (\log_e x) - x^2 + y^2 = 4$ ($y > 0$), then

$\frac{dy}{dx}$ at $x=e$ is equal to :

Options

1. $\frac{(1+2e)}{2\sqrt{4+e^2}}$

2. $\frac{(2e-1)}{2\sqrt{4+e^2}}$

3. $\frac{(1+2e)}{\sqrt{4+e^2}}$

4. $\frac{e}{\sqrt{4+e^2}}$

Question ID : 4165299216

Option 1 ID : 41652936324

Option 2 ID : 41652936322

Option 3 ID : 41652936325

Option 4 ID : 41652936323

Status : Answered

Chosen Option : 2

Q.15

$$\text{If } \int \frac{\sqrt{1-x^2}}{x^4} dx = A(x) \left(\sqrt{1-x^2} \right)^m + C ,$$

for a suitable chosen integer m and a function $A(x)$, where C is a constant of integration, then $(A(x))^m$ equals :

Options

1. $\frac{-1}{27x^9}$

2. $\frac{-1}{3x^3}$

3. $\frac{1}{27x^6}$

4. $\frac{1}{9x^4}$

Question ID : 4165299219

Option 1 ID : 41652936336

Option 2 ID : 41652936335

Option 3 ID : 41652936337

Option 4 ID : 41652936334

Status : Answered

Chosen Option : 4

Q.16

Let $[x]$ denote the greatest integer less than or equal to x . Then :

$$\lim_{x \rightarrow 0} \frac{\tan(\pi \sin^2 x) + (|x| - \sin(x[x]))^2}{x^2} :$$

Options 1. does not exist

- 2. equals π
- 3. equals $\pi + 1$
- 4. equals 0

Question ID : 4165299215

Option 1 ID : 41652936321

Option 2 ID : 41652936318

Option 3 ID : 41652936320

Option 4 ID : 41652936319

Status : Not Answered

Chosen Option : --

Q.17

The maximum value of the function $f(x) = 3x^3 - 18x^2 + 27x - 40$ on the set $S = \{x \in \mathbb{R} : x^2 + 30 \leq 11x\}$ is :

Options 1. -122
2. -222
3. 122
4. 222

Question ID : 4165299218

Option 1 ID : 41652936331

Option 2 ID : 41652936333

Option 3 ID : 41652936330

Option 4 ID : 41652936332

Status : Answered

Chosen Option : 3

Q.18

Let $f : \mathbb{R} \rightarrow \mathbb{R}$ be defined by $f(x) = \frac{x}{1+x^2}$,
 $x \in \mathbb{R}$. Then the range of f is :

Options

- 1. $\left[-\frac{1}{2}, \frac{1}{2}\right]$
- 2. $\mathbb{R} - [-1, 1]$
- 3. $\mathbb{R} - \left[-\frac{1}{2}, \frac{1}{2}\right]$
- 4. $(-1, 1) - \{0\}$

Question ID : 4165299206

Option 1 ID : 41652936285

Option 2 ID : 41652936283

Option 3 ID : 41652936282

Option 4 ID : 41652936284

Status : Answered

Chosen Option : 1

Q.19

The sum of an infinite geometric series with positive terms is 3 and the sum of the cubes

of its terms is $\frac{27}{19}$. Then the common ratio of this series is :

Options

1. $\frac{1}{3}$
2. $\frac{2}{3}$
3. $\frac{2}{9}$
4. $\frac{4}{9}$

Question ID : 4165299213

Option 1 ID : 41652936312

Option 2 ID : 41652936313

Option 3 ID : 41652936311

Option 4 ID : 41652936310

Status : Answered

Chosen Option : 2

Q.20

The straight line $x + 2y = 1$ meets the coordinate axes at A and B. A circle is drawn through A, B and the origin. Then the sum of perpendicular distances from A and B on the tangent to the circle at the origin is :

Options

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

Question ID : 4165299224

Option 1 ID : 41652936357

Option 2 ID : 41652936356

Option 3 ID : 41652936355

Option 4 ID : 41652936354

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.21

In a triangle, the sum of lengths of two sides is x and the product of the lengths of the same two sides is y . If $x^2 - c^2 = y$, where c is the length of the third side of the triangle, then the circumradius of the triangle is :

Options

1. $\frac{3}{2}y$

2. $\frac{c}{\sqrt{3}}$

3. $\frac{c}{3}$

4. $\frac{y}{\sqrt{3}}$

Question ID : 4165299234

Option 1 ID : 41652936397

Option 2 ID : 41652936395

Option 3 ID : 41652936394

Option 4 ID : 41652936396

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.22 Equation of a common tangent to the parabola $y^2 = 4x$ and the hyperbola $xy = 2$ is :

Options 1. $x + y + 1 = 0$

2. $x - 2y + 4 = 0$

3. $x + 2y + 4 = 0$

4. $4x + 2y + 1 = 0$

Question ID : 4165299226

Option 1 ID : 41652936363

Option 2 ID : 41652936362

Option 3 ID : 41652936365

Option 4 ID : 41652936364

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.23 The sum of the real values of x for which the middle term in the binomial expansion

of $\left(\frac{x^3}{3} + \frac{3}{x}\right)^8$ equals 5670 is :

Options 1. 0

2. 6

3. 4

4. 8

Question ID : 4165299211

Option 1 ID : 41652936302

Option 2 ID : 41652936304

Option 3 ID : 41652936303

Option 4 ID : 41652936305

Status : Answered

Chosen Option : 1

Q.24

Let a_1, a_2, \dots, a_{10} be a G.P. If $\frac{a_3}{a_1} = 25$, then

$\frac{a_9}{a_5}$ equals :

Options 1. 5^4

2. $4(5^2)$

3. 5^3

4. $2(5^2)$

Question ID : 4165299212

Option 1 ID : 41652936309

Option 2 ID : 41652936307

Option 3 ID : 41652936308

Option 4 ID : 41652936306

Status : Answered

Chosen Option : 1

Q.25

Let $A = \begin{pmatrix} 0 & 2q & r \\ p & q & -r \\ p & -q & r \end{pmatrix}$. If $AA^T = I_3$, then

$|p|$ is :

Options

1. $\frac{1}{\sqrt{5}}$

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

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

4. $\frac{1}{\sqrt{6}}$

Question ID : 4165299209

Option 1 ID : 41652936296

Option 2 ID : 41652936295

Option 3 ID : 41652936294

Option 4 ID : 41652936297

Status : Answered

Chosen Option : 3

Q.26

If $y(x)$ is the solution of the differential

$$\text{equation } \frac{dy}{dx} + \left(\frac{2x+1}{x} \right) y = e^{-2x}, x > 0,$$

where $y(1) = \frac{1}{2}e^{-2}$, then:

Options

1. $y(\log_e 2) = \log_e 4$
2. $y(\log_e 2) = \frac{\log_e 2}{4}$
3. $y(x)$ is decreasing in $\left(\frac{1}{2}, 1\right)$
4. $y(x)$ is decreasing in $(0, 1)$

Question ID : 4165299222

Option 1 ID : 41652936347

Option 2 ID : 41652936346

Option 3 ID : 41652936349

Option 4 ID : 41652936348

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.27

The direction ratios of normal to the plane through the points $(0, -1, 0)$ and $(0, 0, 1)$

and making an angle $\frac{\pi}{4}$ with the plane

$y - z + 5 = 0$ are :

Options

1. $2, -1, 1$
2. $2, \sqrt{2}, -\sqrt{2}$
3. $\sqrt{2}, 1, -1$
4. $2\sqrt{3}, 1, -1$

Question ID : 4165299228

Option 1 ID : 41652936372

Option 2 ID : 41652936373

Option 3 ID : 41652936370

Option 4 ID : 41652936371

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.28

Let $\vec{a} = \hat{i} + 2\hat{j} + 4\hat{k}$, $\vec{b} = \hat{i} + \lambda\hat{j} + 4\hat{k}$ and

$\vec{c} = 2\hat{i} + 4\hat{j} + (\lambda^2 - 1)\hat{k}$ be coplanar

vectors. Then the non-zero vector $\vec{a} \times \vec{c}$ is :

Options

1. $-\hat{10}\hat{i} - \hat{5}\hat{j}$

2. $-\hat{14}\hat{i} - \hat{5}\hat{j}$

3. $-\hat{14}\hat{i} + \hat{5}\hat{j}$

4. $-\hat{10}\hat{i} + \hat{5}\hat{j}$

Question ID : 4165299230

Option 1 ID : 41652936378

Option 2 ID : 41652936379

Option 3 ID : 41652936381

Option 4 ID : 41652936380

Status : Answered

Chosen Option : 4

Q.29 If one real root of the quadratic equation $81x^2 + kx + 256 = 0$ is cube of the other root, then a value of k is :

Options 1. -81

2. 100

3. 144

4. -300

Question ID : 4165299207

Option 1 ID : 41652936289

Option 2 ID : 41652936287

Option 3 ID : 41652936288

Option 4 ID : 41652936286

Status : Answered

Chosen Option : 4

Q.30

Let $\left(-2 - \frac{1}{3}i\right)^3 = \frac{x+iy}{27}$ ($i = \sqrt{-1}$), where

x and y are real numbers, then $y-x$ equals :

Options 1. 91

2. -85

3. 85

4. -91

Question ID : 4165299208

Option 1 ID : 41652936290

Option 2 ID : 41652936293

Option 3 ID : 41652936291

Option 4 ID : 41652936292

Status : Answered

Chosen Option : 4