JEE April 2019

Test Date	10/04/2019
Test Time	2:30 PM - 5:30 PM
Subject	Paper I EH

Section : **Physics**

Q.1 In the formula $X = 5YZ^2$, X and Z have dimensions of capacitance and magnetic field, respectively. What are the dimensions of Y in SI units ?

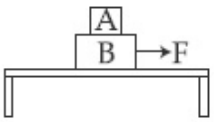
Options

1. $[M^{-1} L^{-2} T^4 A^2]$
2. $[M^{-2} L^0 T^{-4} A^{-2}]$
3. $[M^{-2} L^{-2} T^6 A^3]$
4. $[M^{-3} L^{-2} T^8 A^4]$ ✓

Question Type : **MCQ**
Question ID : **41652914316**
Option 1 ID : **41652956042**
Option 2 ID : **41652956045**
Option 3 ID : **41652956044**
Option 4 ID : **41652956043**
Status : **Answered**
Chosen Option : **3**

Q.2 Two blocks A and B of masses $m_A = 1$ kg and $m_B = 3$ kg are kept on the table as shown in figure. The coefficient of friction between A and B is 0.2 and between B and the surface of the table is also 0.2. The maximum force F that can be applied on B horizontally, so that the block A does not slide over the block B is :

[Take $g = 10$ m/s^2]



Options

1. 16 N ✓
2. 12 N

3. 40 N

4. 8 N

Question Type : **MCQ**
Question ID : **41652914319**
Option 1 ID : **41652956056**
Option 2 ID : **41652956055**
Option 3 ID : **41652956057**
Option 4 ID : **41652956054**
Status : **Answered**
Chosen Option : **4**

Q.3 A solid sphere of mass M and radius R is divided into two unequal parts. The first part has a mass of $\frac{7M}{8}$ and is converted into a uniform disc of radius 2R. The second part is converted into a uniform solid sphere. Let I_1 be the moment of inertia of the disc about its axis and I_2 be the moment of inertia of the new sphere about its axis. The ratio I_1/I_2 is given by :

Options

1. 140 ✓

2. 185

3. 65

4. 285

Question Type : **MCQ**
Question ID : **41652914321**
Option 1 ID : **41652956062**
Option 2 ID : **41652956065**
Option 3 ID : **41652956063**
Option 4 ID : **41652956064**
Status : **Answered**
Chosen Option : **1**

Q.4 One mole of an ideal gas passes through a process where pressure and volume obey the relation $P=P_o\left[1-\frac{1}{2}\left(\frac{V_o}{V}\right)^2\right]$. Here P_o and V_o are constants. Calculate the change in the temperature of the gas if its volume changes from V_o to $2V_o$.

Options

1. $\frac{1}{4}\frac{P_o V_o}{R}$

2. $\frac{5}{4}\frac{P_o V_o}{R}$ ✓

3. $\frac{1}{2}\frac{P_o V_o}{R}$

4. $\frac{3}{4}\frac{P_o V_o}{R}$

Question Type : **MCQ**
Question ID : **41652914326**
Option 1 ID : **41652956083**
Option 2 ID : **41652956085**
Option 3 ID : **41652956082**
Option 4 ID : **41652956084**
Status : **Answered**
Chosen Option : **2**

Q.5 A square loop is carrying a steady current I and the magnitude of its magnetic dipole moment is m. If this square loop is changed to a circular loop and it carries the same current, the magnitude of the magnetic dipole moment of circular loop will be :

Options

1. $\frac{4m}{\pi}$ ✓

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

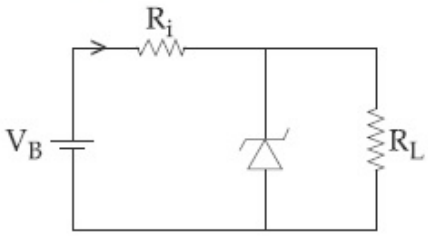
3. $\frac{2m}{\pi}$

4. $\frac{m}{\pi}$

Question Type : **MCQ**
Question ID : **41652914334**
Option 1 ID : **41652956117**
Option 2 ID : **41652956116**
Option 3 ID : **41652956115**
Option 4 ID : **41652956114**
Status : **Answered**
Chosen Option : **1**

Q.6

The figure represents a voltage regulator circuit using a Zener diode. The breakdown voltage of the Zener diode is 6 V and the load resistance is, $R_L = 4\ k\Omega$. The series resistance of the circuit is $R_i = 1\ k\Omega$. If the battery voltage V_B varies from 8 V to 16 V, what are the minimum and maximum values of the current through Zener diode ?



Options

1. 0.5 mA; 6 mA
2. 1 mA; 8.5 mA
3. 0.5 mA; 8.5 mA ✓
4. 1.5 mA; 8.5 mA

Question Type : **MCQ**
Question ID : **41652914342**
Option 1 ID : **41652956146**
Option 2 ID : **41652956149**
Option 3 ID : **41652956148**
Option 4 ID : **41652956147**
Status : **Answered**
Chosen Option : **3**

Q.7

A spaceship orbits around a planet at a height of 20 km from its surface. Assuming that only gravitational field of the planet acts on the spaceship, what will be the number of complete revolutions made by the spaceship in 24 hours around the planet ?

[Given : Mass of planet $= 8 \times 10^{22}$ kg,

Radius of planet $= 2 \times 10^{6}$ m,

Gravitational constant $G = 6.67 \times 10^{-11}$ Nm^2/kg^2]

Options

1. 17
2. 9
3. 13

4. 11 ✓

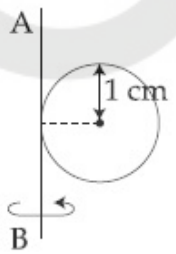
Question Type : **MCQ**
Question ID : **41652914323**
Option 1 ID : **41652956071**
Option 2 ID : **41652956072**
Option 3 ID : **41652956070**
Option 4 ID : **41652956073**
Status : **Answered**
Chosen Option : **1**

Q.8 Light is incident normally on a completely absorbing surface with an energy flux of 25 Wcm^{-2}. If the surface has an area of 25 cm^2, the momentum transferred to the surface in 40 min time duration will be :

Options
1. 6.3×10^{-4} Ns
2. 5.0×10^{-3} Ns ✓
3. 3.5×10^{-6} Ns
4. 1.4×10^{-6} Ns

Question Type : **MCQ**
Question ID : **41652914336**
Option 1 ID : **41652956125**
Option 2 ID : **41652956124**
Option 3 ID : **41652956123**
Option 4 ID : **41652956122**
Status : **Answered**
Chosen Option : **2**

Q.9 A metal coin of mass 5 g and radius 1 cm is fixed to a thin stick AB of negligible mass as shown in the figure. The system is initially at rest. The constant torque, that will make the system rotate about AB at 25 rotations per second in 5 s, is close to :



Options
1. 1.6×10^{-5} Nm
2. 2.0×10^{-5} Nm ✓
3. 7.9×10^{-6} Nm

4. 4.0×10^{-6} Nm

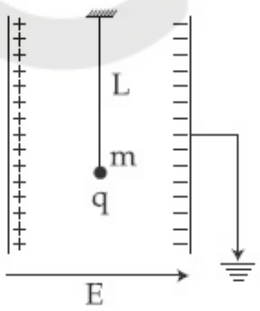
Question Type : **MCQ**
Question ID : **41652914322**
Option 1 ID : **41652956068**
Option 2 ID : **41652956069**
Option 3 ID : **41652956067**
Option 4 ID : **41652956066**
Status : **Answered**
Chosen Option : **1**

Q.10 A 2 mW laser operates at a wavelength of 500 nm. The number of photons that will be emitted per second is :
[Given Planck's constant $h=6.6\times10^{-34}$ Js, speed of light $c=3.0\times10^{8}$ m/s]

Options
1. 1.5×10^{16}
2. 5×10^{15} ✓
3. 2×10^{16}
4. 1×10^{16}

Question Type : **MCQ**
Question ID : **41652914339**
Option 1 ID : **41652956136**
Option 2 ID : **41652956134**
Option 3 ID : **41652956137**
Option 4 ID : **41652956135**
Status : **Answered**
Chosen Option : **2**

Q.11 A simple pendulum of length L is placed between the plates of a parallel plate capacitor having electric field E, as shown in figure. Its bob has mass m and charge q. The time period of the pendulum is given by :



Options

1. $2\pi\sqrt{\frac{L}{\sqrt{g^2+\left(\frac{qE}{m}\right)^2}}}$ ✓

2. $2\pi\sqrt{\frac{L}{\left(g+\frac{qE}{m}\right)}}$

3. $2\pi\sqrt{\frac{L}{\left(g-\frac{qE}{m}\right)}}$

4. $2\pi\sqrt{\frac{L}{\sqrt{g^2-\frac{q^2E^2}{m^2}}}}$

Question Type : **MCQ**
Question ID : **41652914331**
Option 1 ID : **41652956104**
Option 2 ID : **41652956102**
Option 3 ID : **41652956103**
Option 4 ID : **41652956105**
Status : **Answered**
Chosen Option : **4**

Q.12 The elastic limit of brass is 379 MPa. What should be the minimum diameter of a brass rod if it is to support a 400 N load without exceeding its elastic limit ?

Options

1. 1.00 mm
2. 1.36 mm
3. 1.16 mm ✓
4. 0.90 mm

Question Type : **MCQ**
Question ID : **41652914324**
Option 1 ID : **41652956074**
Option 2 ID : **41652956077**
Option 3 ID : **41652956076**
Option 4 ID : **41652956075**
Status : **Answered**
Chosen Option : **1**

Q.13

A cubical block of side 0.5 m floats on water with 30% of its volume under water. What is the maximum weight that can be put on the block without fully submerging it under water ?

[Take, density of water = 10^3 kg/m^3]

Options

1. 87.5 kg ✓
2. 65.4 kg
3. 30.1 kg
4. 46.3 kg

Question Type : **MCQ**
Question ID : **41652914345**
Option 1 ID : **41652956159**
Option 2 ID : **41652956161**
Option 3 ID : **41652956158**
Option 4 ID : **41652956160**
Status : **Answered**
Chosen Option : **1**

Q.14 When heat Q is supplied to a diatomic gas of rigid molecules, at constant volume its temperature increases by ΔT. The heat required to produce the same change in temperature, at a constant pressure is :

Options

1. $\frac{3}{2}Q$
2. $\frac{7}{5}Q$ ✓
3. $\frac{5}{3}Q$
4. $\frac{2}{3}Q$

Question Type : **MCQ**
Question ID : **41652914327**
Option 1 ID : **41652956089**
Option 2 ID : **41652956087**
Option 3 ID : **41652956086**
Option 4 ID : **41652956088**
Status : **Answered**
Chosen Option : **2**

Q.15

In a Young's double slit experiment, the ratio of the slit's width is 4 : 1. The ratio of the intensity of maxima to minima, close to the central fringe on the screen, will be :

Options
1. 25 : 9
2. 9 : 1 ✓
3. $(\sqrt{3}+1)^4 : 16$
4. 4 : 1

Question Type : **MCQ**
Question ID : **41652914338**
Option 1 ID : **41652956133**
Option 2 ID : **41652956131**
Option 3 ID : **41652956132**
Option 4 ID : **41652956130**
Status : **Answered**
Chosen Option : **1**

Q.16

In an experiment, brass and steel wires of length 1 m each with areas of cross section 1 mm^2 are used. The wires are connected in series and one end of the combined wire is connected to a rigid support and other end is subjected to elongation. The stress required to produce a net elongation of 0.2 mm is,

[Given, the Young's Modulus for steel and brass are, respectively, 120×10^9 N/m^2 and 60×10^9 N/m^2]

Options
1. 4.0×10^6 N/m^2 ✓
2. 1.2×10^6 N/m^2
3. 0.2×10^6 N/m^2
4. 1.8×10^6 N/m^2

Question Type : **MCQ**
Question ID : **41652914344**
Option 1 ID : **41652956155**
Option 2 ID : **41652956156**
Option 3 ID : **41652956154**
Option 4 ID : **41652956157**
Status : **Answered**
Chosen Option : **3**

Q.17

A source of sound S is moving with a velocity of 50 m/s towards a stationary observer. The observer measures the frequency of the source as 1000 Hz. What will be the apparent frequency of the source when it is moving away from the observer after crossing him? (Take velocity of sound in air is 350 m/s)

Options

1. 750 Hz ✓
2. 857 Hz
3. 1143 Hz
4. 807 Hz

Question Type : **MCQ**
Question ID : **41652914329**
Option 1 ID : **41652956096**
Option 2 ID : **41652956094**
Option 3 ID : **41652956095**
Option 4 ID : **41652956097**
Status : **Answered**
Chosen Option : **1**

Q.18

A coil of self inductance 10 mH and resistance 0.1 Ω is connected through a switch to a battery of internal resistance 0.9 Ω. After the switch is closed, the time taken for the current to attain 80% of the saturation value is: [take $ln\,5 = 1.6$]

Options

1. 0.103 s
2. 0.002 s
3. 0.324 s
4. 0.016 s ✓

Question Type : **MCQ**
Question ID : **41652914335**
Option 1 ID : **41652956120**
Option 2 ID : **41652956119**
Option 3 ID : **41652956121**
Option 4 ID : **41652956118**
Status : **Answered**
Chosen Option : **4**

Q.19

Water from a tap emerges vertically downwards with an initial speed of $1.0\ ms^{-1}$. The cross-sectional area of the tap is $10^{-4}\ m^2$. Assume that the pressure is constant throughout the stream of water and that the flow is streamlined. The cross-sectional area of the stream, 0.15 m below the tap would be :
(Take $g = 10\ ms^{-2}$)

Options
1. $1\times10^{-5}\ m^2$
2. $5\times10^{-4}\ m^2$
3. $2\times10^{-5}\ m^2$
4. $5\times10^{-5}\ m^2$ ✓

Question Type : **MCQ**
Question ID : **41652914325**
Option 1 ID : **41652956078**
Option 2 ID : **41652956080**
Option 3 ID : **41652956079**
Option 4 ID : **41652956081**
Status : **Not Answered**
Chosen Option : **--**

Q.20

The time dependence of the position of a particle of mass $m = 2$ is given by $\vec{r}(t) = 2t\hat{i} - 3t^2\hat{j}$. Its angular momentum, with respect to the origin, at time $t = 2$ is :

Options
1. $36\ \hat{k}$
2. $48\ (\hat{i}+\hat{j})$
3. $-48\ \hat{k}$ ✓
4. $-34\ (\hat{k}-\hat{i})$

Question Type : **MCQ**
Question ID : **41652914318**
Option 1 ID : **41652956050**
Option 2 ID : **41652956053**
Option 3 ID : **41652956051**
Option 4 ID : **41652956052**
Status : **Answered**
Chosen Option : **2**

Q.21

In Li^{++}, electron in first Bohr orbit is excited to a level by a radiation of wavelength λ. When the ion gets deexcited to the ground state in all possible ways (including intermediate emissions), a total of six spectral lines are observed. What is the value of λ ?

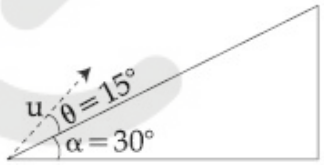
(Given : $h = 6.63 \times 10^{-34}$ Js; $c = 3 \times 10^{8}$ ms^{-1})

Options
1. 10.8 nm ✓
2. 9.4 nm
3. 11.4 nm
4. 12.3 nm

Question Type : **MCQ**
Question ID : **41652914340**
Option 1 ID : **41652956139**
Option 2 ID : **41652956138**
Option 3 ID : **41652956140**
Option 4 ID : **41652956141**
Status : **Answered**
Chosen Option : **3**

Q.22 A plane is inclined at an angle $\alpha = 30°$ with respect to the horizontal. A particle is projected with a speed $u = 2$ ms^{-1}, from the base of the plane, making an angle $\theta = 15°$ with respect to the plane as shown in the figure. The distance from the base, at which the particle hits the plane is close to :

(Take $g = 10$ ms^{-2})



Options
1. 20 cm ✓
2. 18 cm
3. 14 cm
4. 26 cm

Question Type : **MCQ**
Question ID : **41652914317**
Option 1 ID : **41652956048**

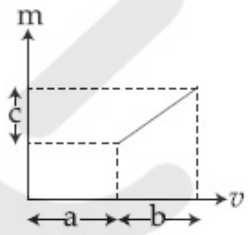
Option 2 ID : **41652956047**
Option 3 ID : **41652956046**
Option 4 ID : **41652956049**
Status : **Answered**
Chosen Option : **3**

Q.23 Two radioactive substances A and B have decay constants 5λ and λ respectively. At $t=0$, a sample has the same number of the two nuclei. The time taken for the ratio of the number of nuclei to become $\left(\frac{1}{e}\right)^2$ will be :

Options
1. $1/\lambda$
2. $1/2\lambda$ ✓
3. $2/\lambda$
4. $1/4\lambda$

Question Type : **MCQ**
Question ID : **41652914341**
Option 1 ID : **41652956142**
Option 2 ID : **41652956144**
Option 3 ID : **41652956143**
Option 4 ID : **41652956145**
Status : **Answered**
Chosen Option : **2**

Q.24 The graph shows how the magnification m produced by a thin lens varies with image distance v. What is the focal length of the lens used ?



Options
1. $\frac{b}{c}$ ✓
2. $\frac{a}{c}$
3. $\frac{b^2c}{a}$

4. $\frac{b^2}{ac}$

Question Type : **MCQ**
Question ID : **41652914337**
Option 1 ID : **41652956129**
Option 2 ID : **41652956127**
Option 3 ID : **41652956128**
Option 4 ID : **41652956126**
Status : **Not Answered**
Chosen Option : **--**

Q.25 In free space, a particle A of charge 1 μC is held fixed at a point P. Another particle B of the same charge and mass 4 μg is kept at a distance of 1 mm from P. If B is released, then its velocity at a distance of 9 mm from P is :

$\left[\text{Take } \frac{1}{4\pi\epsilon_o} = 9\times10^9 \text{ Nm}^2\text{C}^{-2}\right]$

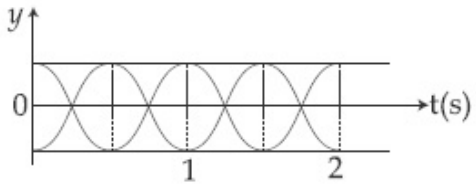
Options

1. 1.0 m/s
2. $1.5\times10^2\text{ m/s}$
3. $2.0\times10^3\text{ m/s}$ ✓
4. $3.0\times10^4\text{ m/s}$

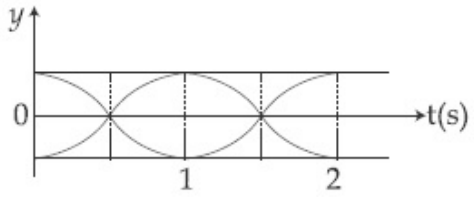
Question Type : **MCQ**
Question ID : **41652914330**
Option 1 ID : **41652956101**
Option 2 ID : **41652956100**
Option 3 ID : **41652956099**
Option 4 ID : **41652956098**
Status : **Answered**
Chosen Option : **2**

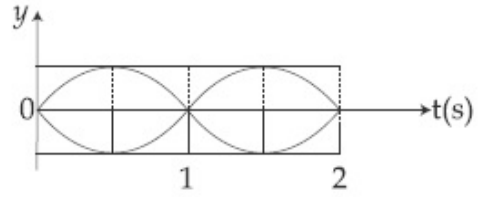
Q.26 The correct figure that shows, schematically, the wave pattern produced by superposition of two waves of frequencies 9 Hz and 11 Hz, is :

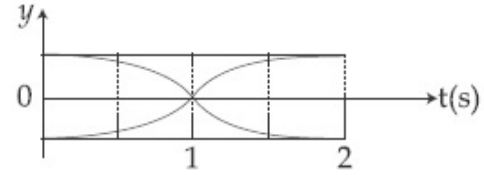
Options

1. 

✓

2.


3.


4.


Question Type : **MCQ**
Question ID : **41652914343**
Option 1 ID : **41652956151**
Option 2 ID : **41652956150**
Option 3 ID : **41652956153**
Option 4 ID : **41652956152**
Status : **Answered**
Chosen Option : **3**

Q.27 Space between two concentric conducting spheres of radii a and b (b > a) is filled with a medium of resistivity ρ. The resistance between the two spheres will be :

Options

1. $\frac{\rho}{4\pi}\left(\frac{1}{a}+\frac{1}{b}\right)$

2. $\frac{\rho}{2\pi}\left(\frac{1}{a}+\frac{1}{b}\right)$

3. $\frac{\rho}{4\pi}\left(\frac{1}{a}-\frac{1}{b}\right)$ ✓

4. $\frac{\rho}{2\pi}\left(\frac{1}{a}-\frac{1}{b}\right)$

Question Type : **MCQ**
Question ID : **41652914332**
Option 1 ID : **41652956106**
Option 2 ID : **41652956108**
Option 3 ID : **41652956107**
Option 4 ID : **41652956109**
Status : **Answered**
Chosen Option : **3**

Q.28

A submarine experiences a pressure of 5.05×10^6 Pa at a depth of d_1 in a sea. When it goes further to a depth of d_2, it experiences a pressure of 8.08×10^6 Pa. Then $d_2 - d_1$ is approximately (density of water $= 10^3$ kg/m^3 and acceleration due to gravity $= 10$ ms^{-2}) :

Options

1. 600 m
2. 500 m
3. 300 m ✓
4. 400 m

Question Type : **MCQ**
Question ID : **41652914328**
Option 1 ID : **41652956091**
Option 2 ID : **41652956092**
Option 3 ID : **41652956090**
Option 4 ID : **41652956093**
Status : **Answered**
Chosen Option : **3**

Q.29

The magnitude of the magnetic field at the center of an equilateral triangular loop of side 1 m which is carrying a current of 10 A is :
[Take $\mu_o = 4\pi \times 10^{-7}$ NA^{-2}]

Options

1. 3 μT
2. 1 μT
3. 18 μT ✓
4. 9 μT

Question Type : **MCQ**
Question ID : **41652914333**
Option 1 ID : **41652956111**
Option 2 ID : **41652956110**
Option 3 ID : **41652956113**
Option 4 ID : **41652956112**
Status : **Not Answered**
Chosen Option : **--**

Q.30

A bullet of mass 20 g has an initial speed of $1\ ms^{-1}$, just before it starts penetrating a mud wall of thickness 20 cm. If the wall offers a mean resistance of 2.5×10^{-2} N, the speed of the bullet after emerging from the other side of the wall is close to :

Options

1. $0.7\ ms^{-1}$ ✓
2. $0.3\ ms^{-1}$
3. $0.1\ ms^{-1}$
4. $0.4\ ms^{-1}$

Question Type : **MCQ**
Question ID : **41652914320**
Option 1 ID : **41652956058**
Option 2 ID : **41652956059**
Option 3 ID : **41652956061**
Option 4 ID : **41652956060**
Status : **Answered**
Chosen Option : **2**

Section : **Chemistry**

Q.1 The INCORRECT statement is :

Options

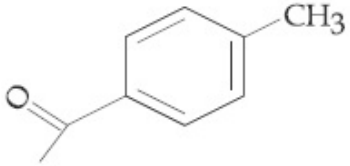
1. the spin-only magnetic moments of $[Fe(H_2O)_6]^{2+}$ and $[Cr(H_2O)_6]^{2+}$ are nearly similar.
2. the spin-only magnetic moment of $[Ni(NH_3)_4(H_2O)_2]^{2+}$ is 2.83 BM.
3. the gemstone, ruby, has Cr^{3+} ions occupying the octahedral sites of beryl. ✓
4. the color of $[CoCl(NH_3)_5]^{2+}$ is violet as it absorbs the yellow light.

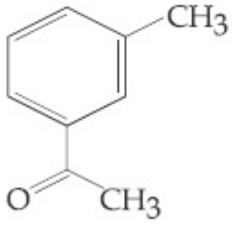
Question Type : **MCQ**
Question ID : **41652914364**
Option 1 ID : **41652956235**
Option 2 ID : **41652956234**
Option 3 ID : **41652956237**
Option 4 ID : **41652956236**
Status : **Answered**
Chosen Option : **1**

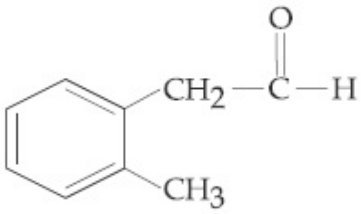
Q.2

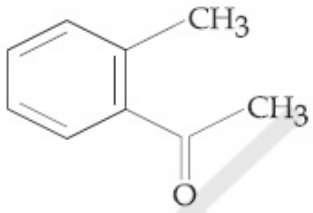
Compound A($C_9H_{10}O$) shows positive iodoform test. Oxidation of A with $KMnO_4/KOH$ gives acid B($C_8H_6O_4$). Anhydride of B is used for the preparation of phenolphthalein. Compound A is :

Options

1. 

2. 

3. 

4.  ✓

Question Type : **MCQ**
Question ID : **41652914351**
Option 1 ID : **41652956182**
Option 2 ID : **41652956184**
Option 3 ID : **41652956185**
Option 4 ID : **41652956183**
Status : **Answered**
Chosen Option : **1**

Q.3 The correct order of the first ionization enthalpies is :

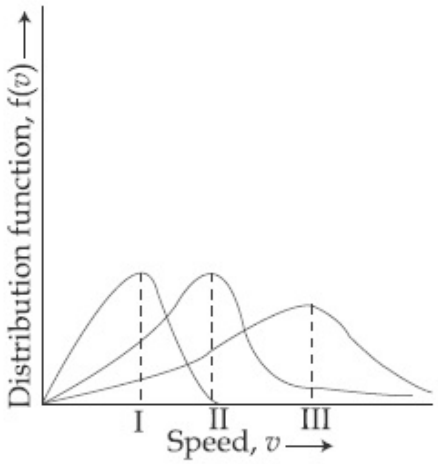
Options

1. $Ti < Mn < Zn < Ni$
2. $Ti < Mn < Ni < Zn$ ✓
3. $Mn < Ti < Zn < Ni$
4. $Zn < Ni < Mn < Ti$

Question Type : **MCQ**
Question ID : **41652914356**
Option 1 ID : **41652956204**

Option 2 ID : **41652956202**
Option 3 ID : **41652956203**
Option 4 ID : **41652956205**
Status : **Answered**
Chosen Option : **1**

Q.4 Points I, II and III in the following plot respectively correspond to
(V_{mp} : most probable velocity)



Options

1. V_{mp} of N_2 (300 K); V_{mp} of H_2 (300 K); V_{mp} of O_2 (400 K)

2. V_{mp} of H_2 (300 K); V_{mp} of N_2 (300 K); V_{mp} of O_2 (400 K)

3. V_{mp} of N_2 (300 K); V_{mp} of O_2 (400 K); V_{mp} of H_2 (300 K) ✓

4. V_{mp} of O_2 (400 K); V_{mp} of N_2 (300 K); V_{mp} of H_2 (300 K)

Question Type : **MCQ**
Question ID : **41652914367**
Option 1 ID : **41652956249**
Option 2 ID : **41652956246**
Option 3 ID : **41652956248**
Option 4 ID : **41652956247**
Status : **Answered**
Chosen Option : **3**

Q.5

For the reaction,

$2\,SO_2(g) + O_2(g) \rightleftharpoons 2\,SO_3(g)$,

$\Delta H = -57.2\ kJ\ mol^{-1}$ and

$K_c = 1.7 \times 10^{16}$.

Which of the following statement is INCORRECT ?

Options

1. The equilibrium constant is large suggestive of reaction going to completion and so no catalyst is required. ✓
2. The equilibrium will shift in forward direction as the pressure increases.
3. The equilibrium constant decreases as the temperature increases.
4. The addition of inert gas at constant volume will not affect the equilibrium constant.

Question Type : **MCQ**
Question ID : **41652914371**
Option 1 ID : **41652956265**
Option 2 ID : **41652956263**
Option 3 ID : **41652956262**
Option 4 ID : **41652956264**
Status : **Answered**
Chosen Option : **4**

Q.6 The crystal field stabilization energy (CFSE) of $[Fe(H_2O)_6]Cl_2$ and $K_2[NiCl_4]$, respectively, are :

Options

1. $-0.4\Delta_o$ and $-1.2\Delta_t$
2. $-2.4\Delta_o$ and $-1.2\Delta_t$
3. $-0.4\Delta_o$ and $-0.8\Delta_t$ ✓
4. $-0.6\Delta_o$ and $-0.8\Delta_t$

Question Type : **MCQ**
Question ID : **41652914363**
Option 1 ID : **41652956233**
Option 2 ID : **41652956232**
Option 3 ID : **41652956231**
Option 4 ID : **41652956230**
Status : **Answered**
Chosen Option : **3**

Q.7

The increasing order of nucleophilicity of the following nucleophiles is :

(a) $CH_3CO_2^{\ominus}$

(b) H_2O

(c) $CH_3SO_3^{\ominus}$

(d) $\overset{\ominus}{O}H$

Options

1. (a) < (d) < (c) < (b)
2. (b) < (c) < (d) < (a)
3. (d) < (a) < (c) < (b)
4. (b) < (c) < (a) < (d) ✓

Question Type : **MCQ**
Question ID : **41652914354**
Option 1 ID : **41652956195**
Option 2 ID : **41652956194**
Option 3 ID : **41652956197**
Option 4 ID : **41652956196**
Status : **Answered**
Chosen Option : **3**

Q.8 Number of stereo centers present in linear and cyclic structures of glucose are respectively :

Options

1. 4 & 4
2. 5 & 5
3. 4 & 5 ✓
4. 5 & 4

Question Type : **MCQ**
Question ID : **41652914349**
Option 1 ID : **41652956174**
Option 2 ID : **41652956177**
Option 3 ID : **41652956175**
Option 4 ID : **41652956176**
Status : **Answered**
Chosen Option : **3**

Q.9

The correct match between Item - I and Item - II is :

	Item - I		Item - II
(a)	High density polythene	(I)	Peroxide catalyst
(b)	Polyacrylonitrile	(II)	Condensation at high temperature & pressure
(c)	Novolac	(III)	Ziegler-Natta Catalyst
(d)	Nylon 6	(IV)	Acid or base catalyst

Options

1. (a) → (IV), (b) → (II), (c) → (I), (d) → (III)
2. (a) → (III), (b) → (I), (c) → (IV), (d) → (II) ✓
3. (a) → (III), (b) → (I), (c) → (II), (d) → (IV)
4. (a) → (II), (b) → (IV), (c) → (I), (d) → (III)

Question Type : **MCQ**
Question ID : **41652914350**
Option 1 ID : **41652956178**
Option 2 ID : **41652956181**
Option 3 ID : **41652956180**
Option 4 ID : **41652956179**
Status : **Answered**
Chosen Option : **1**

Q.10 In chromatography, which of the following statements is INCORRECT for R_f?

Options

1. Higher R_f value means higher adsorption. ✓
2. The value of R_f can not be more than one.
3. R_f value depends on the type of chromatography.
4. R_f value is dependent on the mobile phase.

Question Type : **MCQ**
Question ID : **41652914348**
Option 1 ID : **41652956170**
Option 2 ID : **41652956172**
Option 3 ID : **41652956171**
Option 4 ID : **41652956173**
Status : **Answered**

Chosen Option : **3**

Q.11 For the reaction of H_2 with I_2, the rate constant is 2.5×10^{-4} dm^3 mol^{-1} s^{-1} at 327 °C and 1.0 dm^3 mol^{-1} s^{-1} at 527 °C. The activation energy for the reaction, in kJ mol^{-1} is :

($R = 8.314$ J K^{-1} mol^{-1})

Options
1. 166 ✓
2. 59
3. 72
4. 150

Question Type : **MCQ**
Question ID : **41652914374**
Option 1 ID : **41652956277**
Option 2 ID : **41652956274**
Option 3 ID : **41652956275**
Option 4 ID : **41652956276**
Status : **Answered**
Chosen Option : **1**

Q.12 The number of pentagons in C_{60} and trigons (triangles) in white phosphorus, respectively, are :

Options
1. 12 and 3
2. 20 and 4
3. 20 and 3
4. 12 and 4 ✓

Question Type : **MCQ**
Question ID : **41652914361**
Option 1 ID : **41652956223**
Option 2 ID : **41652956225**
Option 3 ID : **41652956224**
Option 4 ID : **41652956222**
Status : **Answered**
Chosen Option : **2**

Q.13 The ratio of the shortest wavelength of two spectral series of hydrogen spectrum is found to be about 9. The spectral series are :

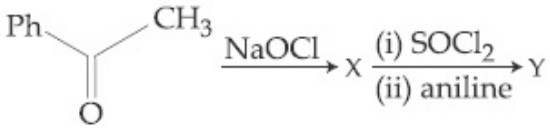
Options
1. Paschen and Pfund
2. Balmer and Brackett

3. Lyman and Paschen ✓

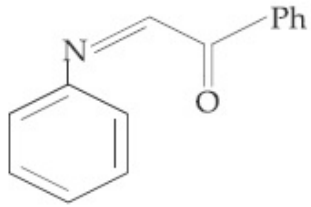
4. Brackett and Pfund

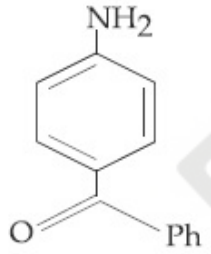
Question Type : **MCQ**
Question ID : **41652914368**
Option 1 ID : **41652956252**
Option 2 ID : **41652956250**
Option 3 ID : **41652956251**
Option 4 ID : **41652956253**
Status : **Answered**
Chosen Option : **4**

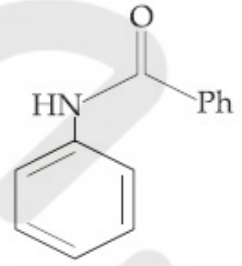
Q.14 The major product 'Y' in the following reaction is :



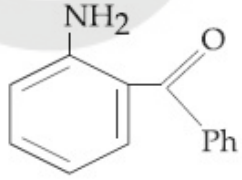
Options

1. 

2. 

3. 

✓

4. 

Question Type : **MCQ**
Question ID : **41652914346**
Option 1 ID : **41652956163**
Option 2 ID : **41652956165**
Option 3 ID : **41652956164**
Option 4 ID : **41652956162**

Status : **Answered**
Chosen Option : **2**

Q.15 Which of these factors does not govern the stability of a conformation in acyclic compounds ?

Options
1. Steric interactions
2. Angle strain ✓
3. Torsional strain
4. Electrostatic forces of interaction

Question Type : **MCQ**
Question ID : **41652914347**
Option 1 ID : **41652956166**
Option 2 ID : **41652956167**
Option 3 ID : **41652956168**
Option 4 ID : **41652956169**
Status : **Answered**
Chosen Option : **4**

Q.16 1 g of a non-volatile non-electrolyte solute is dissolved in 100 g of two different solvents A and B whose ebullioscopic constants are in the ratio of 1 : 5. The ratio of the elevation in their boiling points, $\frac{\Delta T_b(A)}{\Delta T_b(B)}$, is :

Options
1. 10 : 1
2. 1 : 5 ✓
3. 1 : 0.2
4. 5 : 1

Question Type : **MCQ**
Question ID : **41652914370**
Option 1 ID : **41652956261**
Option 2 ID : **41652956260**
Option 3 ID : **41652956258**
Option 4 ID : **41652956259**
Status : **Answered**
Chosen Option : **3**

Q.17

The correct statements among (a) to (d) are :

(a) saline hydrides produce H_2 gas when reacted with H_2O.

(b) reaction of $LiAlH_4$ with BF_3 leads to B_2H_6.

(c) PH_3 and CH_4 are electron - rich and electron - precise hydrides, respectively.

(d) HF and CH_4 are called as molecular hydrides.

Options

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

Question Type : **MCQ**
Question ID : **41652914358**
Option 1 ID : **41652956212**
Option 2 ID : **41652956211**
Option 3 ID : **41652956210**
Option 4 ID : **41652956213**
Status : **Answered**
Chosen Option : **4**

Q.18 The difference between ΔH and ΔU ($\Delta H - \Delta U$), when the combustion of one mole of heptane(l) is carried out at a temperature T, is equal to :

Options

1. $-4\,RT$ ✓
2. $3\,RT$
3. $4\,RT$
4. $-3\,RT$

Question Type : **MCQ**
Question ID : **41652914369**
Option 1 ID : **41652956256**
Option 2 ID : **41652956255**
Option 3 ID : **41652956254**
Option 4 ID : **41652956257**
Status : **Answered**
Chosen Option : **1**

Q.19 The correct statement is :

Options
1. aniline is a froth stabilizer. ✓
2. zone refining process is used for the refining of titanium.
3. zincite is a carbonate ore.
4. sodium cyanide cannot be used in the metallurgy of silver.

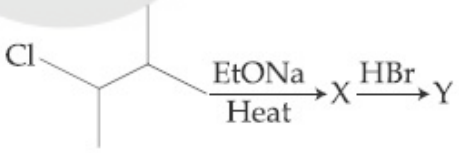
Question Type : **MCQ**
Question ID : **41652914357**
Option 1 ID : **41652956206**
Option 2 ID : **41652956209**
Option 3 ID : **41652956208**
Option 4 ID : **41652956207**
Status : **Answered**
Chosen Option : **3**

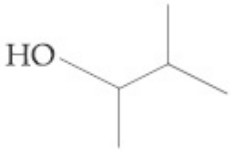
Q.20 The minimum amount of $O_2(g)$ consumed per gram of reactant is for the reaction :
(Given atomic mass : Fe = 56, O = 16, Mg = 24, P = 31, C = 12, H = 1)

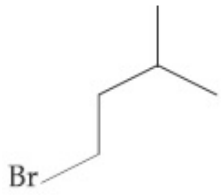
Options
1. $P_4(s) + 5\ O_2(g) \rightarrow P_4O_{10}(s)$
2. $2\ Mg(s) + O_2(g) \rightarrow 2\ MgO(s)$
3. $4\ Fe(s) + 3\ O_2(g) \rightarrow 2\ Fe_2O_3(s)$ ✓
4. $C_3H_8(g) + 5O_2(g) \rightarrow 3CO_2(g) + 4\ H_2O(l)$

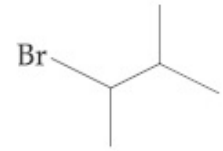
Question Type : **MCQ**
Question ID : **41652914366**
Option 1 ID : **41652956244**
Option 2 ID : **41652956243**
Option 3 ID : **41652956242**
Option 4 ID : **41652956245**
Status : **Answered**
Chosen Option : **4**

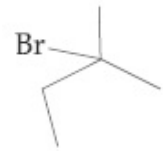
Q.21 The major product 'Y' in the following reaction is :



Options
1. 

2. 

3. 

4. 

✓

Question Type : **MCQ**
Question ID : **41652914352**
Option 1 ID : **41652956187**
Option 2 ID : **41652956189**
Option 3 ID : **41652956186**
Option 4 ID : **41652956188**
Status : **Answered**
Chosen Option : **2**

Q.22 The highest possible oxidation states of uranium and plutonium, respectively, are :

Options
1. 4 and 6
2. 7 and 6
3. 6 and 4
4. 6 and 7 ✓

Question Type : **MCQ**
Question ID : **41652914362**
Option 1 ID : **41652956229**
Option 2 ID : **41652956226**
Option 3 ID : **41652956228**
Option 4 ID : **41652956227**
Status : **Answered**
Chosen Option : **4**

Q.23 Air pollution that occurs in sunlight is :

Options
1. acid rain
2. reducing smog
3. fog
4. oxidising smog ✓

Question Type : **MCQ**
Question ID : **41652914365**
Option 1 ID : **41652956238**
Option 2 ID : **41652956240**
Option 3 ID : **41652956239**
Option 4 ID : **41652956241**
Status : **Answered**
Chosen Option : **3**

Q.24 The correct option among the following is :

Options

1. Brownian motion in colloidal solution is faster if the viscosity of the solution is very high.
2. Colloidal particles in lyophobic sols can be precipitated by electrophoresis. ✓
3. Colloidal medicines are more effective because they have small surface area.
4. Addition of alum to water makes it unfit for drinking.

Question Type : **MCQ**
Question ID : **41652914375**
Option 1 ID : **41652956281**
Option 2 ID : **41652956280**
Option 3 ID : **41652956279**
Option 4 ID : **41652956278**
Status : **Answered**
Chosen Option : **1**

Q.25 A hydrated solid X on heating initially gives a monohydrated compound Y. Y upon heating above 373 K leads to an anhydrous white powder Z. X and Z, respectively, are :

Options

1. Washing soda and soda ash. ✓
2. Baking soda and soda ash.
3. Washing soda and dead burnt plaster.
4. Baking soda and dead burnt plaster.

Question Type : **MCQ**
Question ID : **41652914359**
Option 1 ID : **41652956216**

Option 2 ID : **41652956214**
Option 3 ID : **41652956215**
Option 4 ID : **41652956217**
Status : **Answered**
Chosen Option : **3**

Q.26 The noble gas that does NOT occur in the atmosphere is :

Options
1. Kr
2. Ne
3. Ra ✓
4. He

Question Type : **MCQ**
Question ID : **41652914360**
Option 1 ID : **41652956220**
Option 2 ID : **41652956219**
Option 3 ID : **41652956221**
Option 4 ID : **41652956218**
Status : **Answered**
Chosen Option : **3**

Q.27 Which of the following is NOT a correct method of the preparation of benzylamine from cyanobenzene ?

Options
1. H_2/Ni
2. (i) HCl/H_2O (ii) $NaBH_4$ ✓
3. (i) $SnCl_2 + HCl(gas)$ (ii) $NaBH_4$
4. (i) $LiAlH_4$ (ii) H_3O^+

Question Type : **MCQ**
Question ID : **41652914355**
Option 1 ID : **41652956200**
Option 2 ID : **41652956198**
Option 3 ID : **41652956201**
Option 4 ID : **41652956199**
Status : **Answered**
Chosen Option : **4**

Q.28 The pH of a 0.02 M NH_4Cl solution will be [given $K_b(NH_4OH) = 10^{-5}$ and $\log 2 = 0.301$]

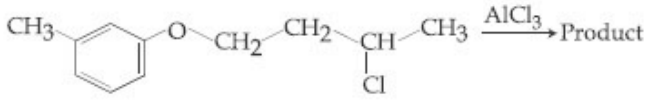
Options
1. 4.65
2. 2.65
3. 4.35
4. 5.35 ✓

Question Type : **MCQ**

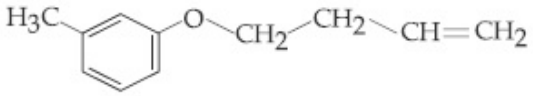
Question ID : **41652914372**
Option 1 ID : **41652956266**
Option 2 ID : **41652956267**
Option 3 ID : **41652956269**
Option 4 ID : **41652956268**
Status : **Answered**
Chosen Option : **3**

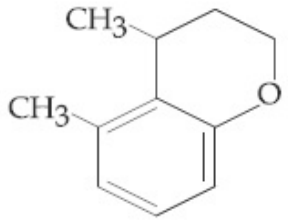
Q.29

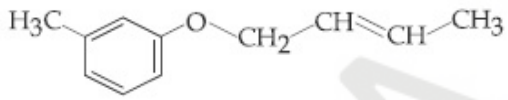
The major product obtained in the given reaction is :

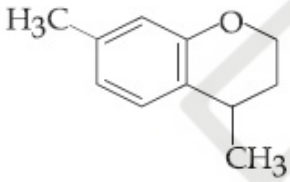


Options

1. 

2. 

3. 

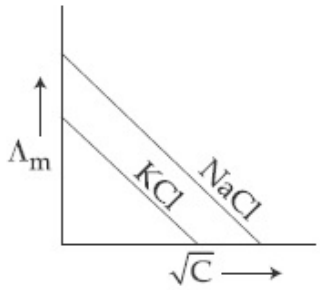
4. 

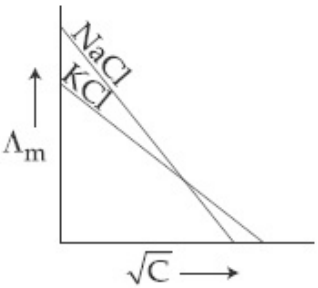
Question Type : **MCQ**
Question ID : **41652914353**
Option 1 ID : **41652956193**
Option 2 ID : **41652956190**
Option 3 ID : **41652956191**
Option 4 ID : **41652956192**
Status : **Answered**
Chosen Option : **2**

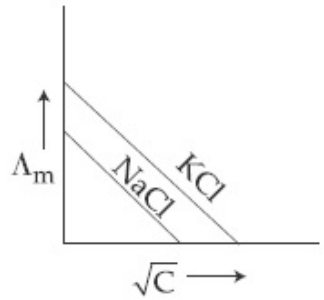
Q.30

Which one of the following graphs between molar conductivity(Λ_m) versus $\sqrt{C}$ is correct ?

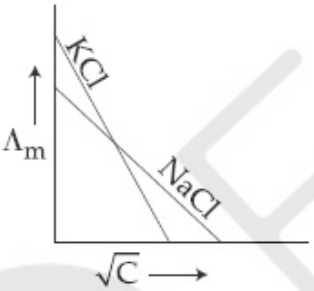
Options

1. 

2. 

3. 

✓

4. 

Question Type : **MCQ**
Question ID : **41652914373**
Option 1 ID : **41652956271**
Option 2 ID : **41652956272**
Option 3 ID : **41652956270**
Option 4 ID : **41652956273**
Status : **Not Answered**
Chosen Option : **--**

Section : **Mathematics**

Q.1

The sum $1 + \frac{1^3+2^3}{1+2} + \frac{1^3+2^3+3^3}{1+2+3} + ...$

$+ \frac{1^3+2^3+3^3+...+15^3}{1+2+3+...+15} - \frac{1}{2}(1+2+3+...+15)$

is equal to :

Options
1. 620 ✓
2. 1240
3. 1860
4. 660

Question Type : **MCQ**
Question ID : **41652914384**
Option 1 ID : **41652956314**
Option 2 ID : **41652956316**
Option 3 ID : **41652956317**
Option 4 ID : **41652956315**
Status : **Answered**
Chosen Option : **1**

Q.2 Lines are drawn parallel to the line $4x-3y+2=0$, at a distance $\frac{3}{5}$ from the origin. Then which one of the following points lies on any of these lines ?

Options
1. $\left(\frac{1}{4}, -\frac{1}{3}\right)$
2. $\left(-\frac{1}{4}, \frac{2}{3}\right)$ ✓
3. $\left(-\frac{1}{4}, -\frac{2}{3}\right)$
4. $\left(\frac{1}{4}, \frac{1}{3}\right)$

Question Type : **MCQ**
Question ID : **41652914393**
Option 1 ID : **41652956351**
Option 2 ID : **41652956353**
Option 3 ID : **41652956352**
Option 4 ID : **41652956350**
Status : **Answered**
Chosen Option : **2**

Q.3 The distance of the point having position vector $-\hat{i}+2\hat{j}+6\hat{k}$ from the straight line passing through the point $(2, 3, -4)$ and parallel to the vector, $6\hat{i}+3\hat{j}-4\hat{k}$ is :

Options
1. $4\sqrt{3}$

2. 6
3. $2\sqrt{13}$
4. 7 ✓

Question Type : **MCQ**
Question ID : **41652914400**
Option 1 ID : **41652956381**
Option 2 ID : **41652956378**
Option 3 ID : **41652956380**
Option 4 ID : **41652956379**
Status : **Answered**
Chosen Option : **3**

Q.4 The area (in sq. units) of the region bounded by the curves $y=2^x$ and $y=|x+1|$, in the first quadrant is :

Options

1. $\frac{3}{2}-\frac{1}{\log_e 2}$ ✓
2. $\frac{1}{2}$
3. $\log_e 2+\frac{3}{2}$
4. $\frac{3}{2}$

Question Type : **MCQ**
Question ID : **41652914391**
Option 1 ID : **41652956343**
Option 2 ID : **41652956344**
Option 3 ID : **41652956342**
Option 4 ID : **41652956345**
Status : **Answered**
Chosen Option : **1**

Q.5 If the tangent to the curve $y=\frac{x}{x^2-3}$, $x \in \mathbf{R}$, $\left(x \neq \pm\sqrt{3}\right)$, at a point $(\alpha, \beta) \neq (0, 0)$ on it is parallel to the line $2x+6y-11=0$, then :

Options

1. $|2\alpha + 6\beta| = 19$
2. $|2\alpha + 6\beta| = 11$
3. $|6\alpha + 2\beta| = 19$ ✓
4. $|6\alpha + 2\beta| = 9$

Question Type : **MCQ**
Question ID : **41652914388**
Option 1 ID : **41652956333**
Option 2 ID : **41652956331**
Option 3 ID : **41652956330**
Option 4 ID : **41652956332**
Status : **Answered**
Chosen Option : **3**

Q.6 If z and w are two complex numbers such that $|zw| = 1$ and $\arg(z) - \arg(w) = \frac{\pi}{2}$, then :

Options

1. $z\overline{w} = \frac{1-i}{\sqrt{2}}$
2. $\overline{z}w = i$
3. $z\overline{w} = \frac{-1+i}{\sqrt{2}}$
4. $\overline{z}w = -i$ ✓

Question Type : **MCQ**
Question ID : **41652914377**
Option 1 ID : **41652956289**
Option 2 ID : **41652956288**
Option 3 ID : **41652956287**
Option 4 ID : **41652956286**
Status : **Answered**
Chosen Option : **3**

Q.7 If $5x + 9 = 0$ is the directrix of the hyperbola $16x^2 - 9y^2 = 144$, then its corresponding focus is :

Options

1. $(-5, 0)$ ✓
2. $(5, 0)$
3. $\left(-\frac{5}{3}, 0\right)$
4. $\left(\frac{5}{3}, 0\right)$

Question Type : **MCQ**
Question ID : **41652914397**
Option 1 ID : **41652956366**
Option 2 ID : **41652956367**
Option 3 ID : **41652956368**
Option 4 ID : **41652956369**
Status : **Answered**
Chosen Option : **3**

Q.8 The tangent and normal to the ellipse $3x^2+5y^2=32$ at the point P(2, 2) meet the x-axis at Q and R, respectively. Then the area (in sq. units) of the triangle PQR is :

Options

1. $\frac{68}{15}$ ✓
2. $\frac{16}{3}$
3. $\frac{14}{3}$
4. $\frac{34}{15}$

Question Type : **MCQ**
Question ID : **41652914396**
Option 1 ID : **41652956365**
Option 2 ID : **41652956363**
Option 3 ID : **41652956364**
Option 4 ID : **41652956362**
Status : **Answered**
Chosen Option : **1**

Q.9 The negation of the Boolean expression $\sim s \vee (\sim r \wedge s)$ is equivalent to :

Options

1. r
2. $s \wedge r$ ✓
3. $s \vee r$
4. $\sim s \wedge \sim r$

Question Type : **MCQ**
Question ID : **41652914405**
Option 1 ID : **41652956400**
Option 2 ID : **41652956399**
Option 3 ID : **41652956398**
Option 4 ID : **41652956401**
Status : **Answered**
Chosen Option : **4**

Q.10 The sum of the real roots of the equation

$$\begin{vmatrix} x & -6 & -1 \\ 2 & -3x & x-3 \\ -3 & 2x & x+2 \end{vmatrix} = 0,$$ is equal to :

Options

1. 0 ✓
2. -4

3. 6

4. 1

Question Type : **MCQ**
Question ID : **41652914379**
Option 1 ID : **41652956295**
Option 2 ID : **41652956294**
Option 3 ID : **41652956297**
Option 4 ID : **41652956296**
Status : **Answered**
Chosen Option : **1**

Q.11 If both the mean and the standard deviation of 50 observations $x_1, x_2, ..., x_{50}$ are equal to 16, then the mean of $(x_1-4)^2, (x_2-4)^2, ...,$ $(x_{50}-4)^2$ is :

Options

1. 525

2. 480

3. 400 ✓

4. 380

Question Type : **MCQ**
Question ID : **41652914401**
Option 1 ID : **41652956385**
Option 2 ID : **41652956384**
Option 3 ID : **41652956383**
Option 4 ID : **41652956382**
Status : **Answered**
Chosen Option : **3**

Q.12 The smallest natural number n, such that the coefficient of x in the expansion of $\left(x^2+\frac{1}{x^3}\right)^n$ is ${}^nC_{23}$, is :

Options

1. 58

2. 38 ✓

3. 35

4. 23

Question Type : **MCQ**
Question ID : **41652914382**
Option 1 ID : **41652956309**
Option 2 ID : **41652956307**
Option 3 ID : **41652956308**
Option 4 ID : **41652956306**
Status : **Answered**
Chosen Option : **1**

Q.13 The angles A, B and C of a triangle ABC are in A.P. and a : b = 1 : $\sqrt{3}$. If c = 4 cm, then the area (in sq.cm) of this triangle is :

Options

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

Question Type : **MCQ**
Question ID : **41652914404**
Option 1 ID : **41652956395**
Option 2 ID : **41652956397**
Option 3 ID : **41652956396**
Option 4 ID : **41652956394**
Status : **Answered**
Chosen Option : **1**

Q.14 If $\int x^5 e^{-x^2} dx = g(x)e^{-x^2} + c$, where c is a constant of integration, then $g(-1)$ is equal to :

Options

1. $-\frac{5}{2}$ ✓
2. -1
3. 1
4. $-\frac{1}{2}$

Question Type : **MCQ**
Question ID : **41652914389**
Option 1 ID : **41652956334**
Option 2 ID : **41652956335**
Option 3 ID : **41652956337**
Option 4 ID : **41652956336**
Status : **Answered**
Chosen Option : **1**

Q.15 Suppose that 20 pillars of the same height have been erected along the boundary of a circular stadium. If the top of each pillar has been connected by beams with the top of all its non-adjacent pillars, then the total number of beams is :

Options
1. 170 ✓
2. 180
3. 210
4. 190

Question Type : **MCQ**
Question ID : **41652914381**
Option 1 ID : **41652956302**
Option 2 ID : **41652956304**
Option 3 ID : **41652956305**
Option 4 ID : **41652956303**
Status : **Answered**
Chosen Option : **1**

Q.16

If $\lim\limits_{x\to 1} \dfrac{x^2 - ax + b}{x - 1} = 5$, then $a + b$ is equal to :

Options
1. 1
2. 5
3. -4
4. -7 ✓

Question Type : **MCQ**
Question ID : **41652914385**
Option 1 ID : **41652956318**
Option 2 ID : **41652956319**
Option 3 ID : **41652956320**
Option 4 ID : **41652956321**
Status : **Answered**
Chosen Option : **4**

Q.17

Let $a_1, a_2, a_3, \ldots$ be an A.P. with $a_6 = 2$. Then the common difference of this A.P., which maximises the product $a_1 a_4 a_5$, is :

Options
1. $\dfrac{2}{3}$
2. $\dfrac{3}{2}$
3. $\dfrac{6}{5}$
4. $\dfrac{8}{5}$ ✓

Question Type : **MCQ**
Question ID : **41652914386**
Option 1 ID : **41652956322**
Option 2 ID : **41652956325**

Option 3 ID : **41652956324**
Option 4 ID : **41652956323**
Status : **Answered**
Chosen Option : **4**

Q.18 Let $y = y(x)$ be the solution of the differential equation, $\frac{dy}{dx} + y\tan x = 2x + x^2\tan x$, $x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$, such that $y(0) = 1$. Then :

Options

1. $y'\left(\frac{\pi}{4}\right) - y'\left(-\frac{\pi}{4}\right) = \pi - \sqrt{2}$ ✓
2. $y'\left(\frac{\pi}{4}\right) + y'\left(-\frac{\pi}{4}\right) = -\sqrt{2}$
3. $y\left(\frac{\pi}{4}\right) - y\left(-\frac{\pi}{4}\right) = \sqrt{2}$
4. $y\left(\frac{\pi}{4}\right) + y\left(-\frac{\pi}{4}\right) = \frac{\pi^2}{2} + 2$

Question Type : **MCQ**
Question ID : **41652914392**
Option 1 ID : **41652956348**
Option 2 ID : **41652956349**
Option 3 ID : **41652956346**
Option 4 ID : **41652956347**
Status : **Answered**
Chosen Option : **1**

Q.19 If $\cos^{-1}x - \cos^{-1}\frac{y}{2} = \alpha$, where $-1 \le x \le 1$, $-2 \le y \le 2$, $x \le \frac{y}{2}$, then for all x, y, $4x^2 - 4xy\cos\alpha + y^2$ is equal to :

Options

1. $4\cos^2\alpha + 2x^2y^2$
2. $4\sin^2\alpha - 2x^2y^2$
3. $2\sin^2\alpha$
4. $4\sin^2\alpha$ ✓

Question Type : **MCQ**
Question ID : **41652914403**
Option 1 ID : **41652956393**
Option 2 ID : **41652956391**
Option 3 ID : **41652956390**
Option 4 ID : **41652956392**
Status : **Answered**

Chosen Option : **4**

Q.20 If the plane $2x-y+2z+3=0$ has the distances $\frac{1}{3}$ and $\frac{2}{3}$ units from the planes $4x-2y+4z+\lambda=0$ and $2x-y+2z+\mu=0$, respectively, then the maximum value of $\lambda+\mu$ is equal to :

Options
1. 9
2. 15
3. 13 ✓
4. 5

Question Type : **MCQ**
Question ID : **41652914399**
Option 1 ID : **41652956375**
Option 2 ID : **41652956377**
Option 3 ID : **41652956376**
Option 4 ID : **41652956374**
Status : **Answered**
Chosen Option : **3**

Q.21 If the line $ax+y=c$, touches both the curves $x^2+y^2=1$ and $y^2=4\sqrt{2}x$, then $|c|$ is equal to :

Options
1. $\frac{1}{2}$
2. $\sqrt{2}$ ✓
3. $\frac{1}{\sqrt{2}}$
4. 2

Question Type : **MCQ**
Question ID : **41652914395**
Option 1 ID : **41652956360**
Option 2 ID : **41652956358**
Option 3 ID : **41652956359**
Option 4 ID : **41652956361**
Status : **Answered**
Chosen Option : **2**

Q.22 The integral $\int_{\pi/6}^{\pi/3} \sec^{2/3}x \operatorname{cosec}^{4/3}x\,dx$ is equal to :

Options

1. $3^{7/6} - 3^{5/6}$ ✓
2. $3^{4/3} - 3^{1/3}$
3. $3^{5/6} - 3^{2/3}$
4. $3^{5/3} - 3^{1/3}$

Question Type : **MCQ**
Question ID : **41652914390**
Option 1 ID : **41652956341**
Option 2 ID : **41652956339**
Option 3 ID : **41652956340**
Option 4 ID : **41652956338**
Status : **Not Answered**
Chosen Option : **--**

Q.23 The number of real roots of the equation $5 + |2^x - 1| = 2^x(2^x - 2)$ is :

Options
1. 2
2. 3
3. 1 ✓
4. 4

Question Type : **MCQ**
Question ID : **41652914378**
Option 1 ID : **41652956292**
Option 2 ID : **41652956293**
Option 3 ID : **41652956291**
Option 4 ID : **41652956290**
Status : **Answered**
Chosen Option : **1**

Q.24 Minimum number of times a fair coin must be tossed so that the probability of getting at least one head is more than 99% is :

Options
1. 8
2. 6
3. 5
4. 7 ✓

Question Type : **MCQ**
Question ID : **41652914402**
Option 1 ID : **41652956389**
Option 2 ID : **41652956387**
Option 3 ID : **41652956386**
Option 4 ID : **41652956388**
Status : **Answered**
Chosen Option : **4**

Q.25 A perpendicular is drawn from a point on the line $\frac{x-1}{2} = \frac{y+1}{-1} = \frac{z}{1}$ to the plane $x+y+z=3$ such that the foot of the perpendicular Q also lies on the plane $x-y+z=3$. Then the co-ordinates of Q are :

Options
1. $(2, 0, 1)$ ✓
2. $(-1, 0, 4)$
3. $(4, 0, -1)$
4. $(1, 0, 2)$

Question Type : **MCQ**
Question ID : **41652914398**
Option 1 ID : **41652956370**
Option 2 ID : **41652956372**
Option 3 ID : **41652956373**
Option 4 ID : **41652956371**
Status : **Answered**
Chosen Option : **3**

Q.26 Let a, b and c be in G.P. with common ratio r, where $a \neq 0$ and $0 < r \leq \frac{1}{2}$. If 3a, 7b and 15c are the first three terms of an A.P., then the 4^{th} term of this A.P. is :

Options
1. a ✓
2. $\frac{7}{3}a$
3. 5 a
4. $\frac{2}{3}a$

Question Type : **MCQ**
Question ID : **41652914383**
Option 1 ID : **41652956311**
Option 2 ID : **41652956312**
Option 3 ID : **41652956313**
Option 4 ID : **41652956310**
Status : **Answered**
Chosen Option : **1**

Q.27

A spherical iron ball of radius 10 cm is coated with a layer of ice of uniform thickness that melts at a rate of $50\,cm^3/min$. When the thickness of the ice is 5 cm, then the rate at which the thickness (in cm/min) of the ice decreases, is :

Options

1. $\frac{1}{9\pi}$
2. $\frac{1}{36\pi}$
3. $\frac{1}{18\pi}$ ✓
4. $\frac{5}{6\pi}$

Question Type : **MCQ**
Question ID : **41652914387**
Option 1 ID : **41652956329**
Option 2 ID : **41652956326**
Option 3 ID : **41652956328**
Option 4 ID : **41652956327**
Status : **Answered**
Chosen Option : **2**

Q.28

Let λ be a real number for which the system of linear equations

$x+y+z=6$

$4x+\lambda y-\lambda z=\lambda-2$

$3x+2y-4z=-5$

has infinitely many solutions. Then λ is a root of the quadratic equation :

Options

1. $\lambda^2+3\lambda-4=0$
2. $\lambda^2-\lambda-6=0$ ✓
3. $\lambda^2-3\lambda-4=0$
4. $\lambda^2+\lambda-6=0$

Question Type : **MCQ**
Question ID : **41652914380**
Option 1 ID : **41652956298**
Option 2 ID : **41652956301**
Option 3 ID : **41652956299**
Option 4 ID : **41652956300**
Status : **Answered**
Chosen Option : **2**

Q.29 Let $f(x)=\log_e(\sin x)$, $(0 < x < \pi)$ and $g(x)=\sin^{-1}(e^{-x})$, $(x \geq 0)$. If α is a positive real number such that $a=(fog)'(\alpha)$ and $b=(fog)(\alpha)$, then :

Options

1. $a\alpha^2+b\alpha+a=0$
2. $a\alpha^2+b\alpha-a=-2\alpha^2$
3. $a\alpha^2-b\alpha-a=0$
4. $a\alpha^2-b\alpha-a=1$ ✓

Question Type : **MCQ**
Question ID : **41652914376**
Option 1 ID : **41652956283**
Option 2 ID : **41652956284**
Option 3 ID : **41652956282**
Option 4 ID : **41652956285**
Status : **Answered**
Chosen Option : **4**

Q.30 The locus of the centres of the circles, which touch the circle, $x^2+y^2=1$ externally, also touch the y-axis and lie in the first quadrant, is :

Options

1. $y=\sqrt{1+2x},\ x \geq 0$ ✓
2. $y=\sqrt{1+4x},\ x \geq 0$
3. $x=\sqrt{1+2y},\ y \geq 0$
4. $x=\sqrt{1+4y},\ y \geq 0$

Question Type : **MCQ**
Question ID : **41652914394**
Option 1 ID : **41652956354**
Option 2 ID : **41652956355**
Option 3 ID : **41652956357**
Option 4 ID : **41652956356**
Status : **Answered**
Chosen Option : **3**