JEE April 2019

Roll No.	PB05700617
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Application No	190310082890
Test Date	09/04/2019
Test Time	9:30 AM - 12:30 PM
Subject	Paper I EH

Section : **Physics**

Q.1 Determine the charge on the capacitor in the following circuit :
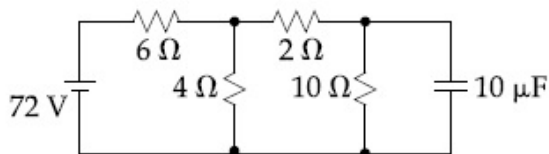
Options
1. $60 \ \mu C$
2. $2 \ \mu C$
3. $10 \ \mu C$
4. $200 \ \mu C$

Question Type : **MCQ**
Question ID : **41652913793**
Option 1 ID : **41652953952**
Option 2 ID : **41652953950**
Option 3 ID : **41652953953**
Option 4 ID : **41652953951**
Status : **Answered**
Chosen Option : **1**

Q.2 The following bodies are made to roll up (without slipping) the same inclined plane from a horizontal plane : (i) a ring of radius R, (ii) a solid cylinder of radius $\frac{R}{2}$ and (iii) a solid sphere of radius $\frac{R}{4}$. If, in each case, the speed of the center of mass at the bottom of the incline is same, the ratio of the maximum heights they climb is :

Options
1. $4 : 3 : 2$
2. $10 : 15 : 7$
3. $14 : 15 : 20$
4. $2 : 3 : 4$

Question Type : **MCQ**
Question ID : **41652913781**
Option 1 ID : **41652953902**
Option 2 ID : **41652953904**

Q.3 A simple pendulum oscillating in air has period T. The bob of the pendulum is completely immersed in a non-viscous liquid. The density of the liquid is $\dfrac{1}{16}$ th of the material of the bob. If the bob is inside liquid all the time, its period of oscillation in this liquid is :

Options

1. $2T\sqrt{\dfrac{1}{10}}$

2. $2T\sqrt{\dfrac{1}{14}}$

3. $4T\sqrt{\dfrac{1}{15}}$

4. $4T\sqrt{\dfrac{1}{14}}$

Q.4 An HCl molecule has rotational, translational and vibrational motions. If the rms velocity of HCl molecules in its gaseous phase is $\bar{v}$, m is its mass and k_B is Boltzmann constant, then its temperature will be :

Options

1. $\dfrac{m\bar{v}^2}{6k_B}$

2. $\dfrac{m\bar{v}^2}{3k_B}$

3. $\dfrac{m\bar{v}^2}{7k_B}$

4. $\dfrac{m\bar{v}^2}{5k_B}$

Question ID : **41652913787**
Option 1 ID : **41652953929**
Option 2 ID : **41652953928**
Option 3 ID : **41652953926**
Option 4 ID : **41652953927**
Status : **Answered**
Chosen Option : **2**

Q.5 A uniform cable of mass 'M' and length 'L' is placed on a horizontal surface such that its $\left(\dfrac{1}{n}\right)^{th}$ part is hanging below the edge of the surface. To lift the hanging part of the cable upto the surface, the work done should be :

Options

1. $\dfrac{MgL}{2n^2}$

2. $\dfrac{MgL}{n^2}$

3. $\dfrac{2MgL}{n^2}$

4. $nMgL$

Question Type : **MCQ**
Question ID : **41652913780**
Option 1 ID : **41652953900**
Option 2 ID : **41652953898**
Option 3 ID : **41652953899**
Option 4 ID : **41652953901**
Status : **Answered**
Chosen Option : **3**

Q.6 Taking the wavelength of first Balmer line in hydrogen spectrum ($n=3$ to $n=2$) as 660 nm, the wavelength of the 2nd Balmer line ($n=4$ to $n=2$) will be :

Options 1. 889.2 nm

2. 488.9 nm

3. 642.7 nm

4. 388.9 nm

Question Type : **MCQ**
Question ID : **41652913800**
Option 1 ID : **41652953979**
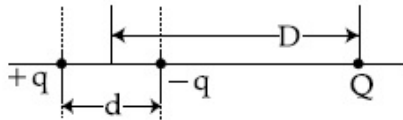Option 2 ID : **41652953978**
Option 3 ID : **41652953981**
Option 4 ID : **41652953980**
Status : **Answered**
Chosen Option : **2**

Q.7

A system of three charges are placed as shown in the figure :

If D >> d, the potential energy of the system is best given by :

Options

1. $\dfrac{1}{4\pi\epsilon_o}\left[-\dfrac{q^2}{d}-\dfrac{qQd}{2D^2}\right]$

2. $\dfrac{1}{4\pi\epsilon_o}\left[-\dfrac{q^2}{d}+\dfrac{2qQd}{D^2}\right]$

3. $\dfrac{1}{4\pi\epsilon_o}\left[+\dfrac{q^2}{d}+\dfrac{qQd}{D^2}\right]$

4. $\dfrac{1}{4\pi\epsilon_o}\left[-\dfrac{q^2}{d}-\dfrac{qQd}{D^2}\right]$

Question Type : **MCQ**

Question ID : **41652913791**

Option 1 ID : **41652953943**

Option 2 ID : **41652953944**

Option 3 ID : **41652953942**
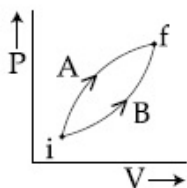
Option 4 ID : **41652953945**

Status : **Answered**

Chosen Option : **4**

Q.8 Following figure shows two processes A and B for a gas. If ΔQ_A and ΔQ_B are the amount of heat absorbed by the system in two cases, and ΔU_A and ΔU_B are changes in internal energies, respectively, then :

Options

1. $\Delta Q_A < \Delta Q_B , \Delta U_A < \Delta U_B$

2. $\Delta Q_A > \Delta Q_B , \Delta U_A > \Delta U_B$

3. $\Delta Q_A > \Delta Q_B , \Delta U_A = \Delta U_B$

4. $\Delta Q_A = \Delta Q_B ; \Delta U_A = \Delta U_B$

Question Type : **MCQ**

Question ID : **41652913786**

Option 1 ID : **41652953925**

Option 2 ID : **41652953923**

Option 3 ID : **41652953924**

Option 4 ID : **41652953922**

Status : **Answered**

Chosen Option : **3**

Q.9 The electric field of light wave is given as

$$\vec{E} = 10^{-3}\cos\left(\frac{2\pi x}{5 \times 10^{-7}} - 2\pi \times 6 \times 10^{14} \, t\right)\hat{x} \; \frac{N}{C}$$

This light falls on a metal plate of work function 2eV. The stopping potential of the photo-electrons is :

Given, E (in eV) = $\dfrac{12375}{\lambda(\text{in } \mathring{A})}$

Options 1. 2.0 V

2. 0.72 V

3. 0.48 V

4. 2.48 V

Question Type : **MCQ**

Question ID : **41652913801**

Option 1 ID : **41652953985**

Option 2 ID : **41652953982**

Option 3 ID : **41652953983**

Option 4 ID : **41652953984**

Status : **Answered**

Chosen Option : **4**

Q.10 A body of mass 2 kg makes an elastic collision with a second body at rest and continues to move in the original direction but with one fourth of its original speed. What is the mass of the second body ?

Options 1. 1.0 kg

2. 1.5 kg

3. 1.8 kg

4. 1.2 kg

Question Type : **MCQ**

Question ID : **41652913779**

Option 1 ID : **41652953896**

Option 2 ID : **41652953894**

Option 3 ID : **41652953897**

Option 4 ID : **41652953895**

Status : **Answered**

Chosen Option : **4**

Q.11 In the density measurement of a cube, the mass and edge length are measured as (10.00 ± 0.10) kg and (0.10 ± 0.01) m, respectively. The error in the measurement of density is :

Options
1. $0.01 \ \text{kg}/\text{m}^3$

2. $0.10 \ \text{kg}/\text{m}^3$

3. $0.31 \ \text{kg}/\text{m}^3$

4. $0.07 \ \text{kg}/\text{m}^3$

Question Type : **MCQ**
Question ID : **41652913776**
Option 1 ID : **41652953885**
Option 2 ID : **41652953882**
Option 3 ID : **41652953884**
Option 4 ID : **41652953883**
Status : **Answered**
Chosen Option : **3**

Q.12 A string is clamped at both the ends and it is vibrating in its 4th harmonic. The equation of the stationary wave is $Y = 0.3 \ \sin(0.157x) \ \cos(200\pi t)$. The length of the string is : (All quantities are in SI units.)

Options
1. 20 m

2. 80 m

3. 40 m

4. 60 m

Question Type : **MCQ**
Question ID : **41652913788**
Option 1 ID : **41652953933**
Option 2 ID : **41652953930**
Option 3 ID : **41652953932**
Option 4 ID : **41652953931**
Status : **Answered**
Chosen Option : **4**

Q.13 A capacitor with capacitance 5 μF is charged to 5 μC. If the plates are pulled apart to reduce the capacitance to 2 μF, how much work is done ?

Options
1. $6.25 \times 10^{-6} \ \text{J}$

2. $3.75 \times 10^{-6} \ \text{J}$

3. $2.16 \times 10^{-6} \ \text{J}$

4. $2.55 \times 10^{-6} \ \text{J}$

Question Type : **MCQ**
Question ID : **41652913790**
Option 1 ID : **41652953938**
Option 2 ID : **41652953941**
Option 3 ID : **41652953939**
Option 4 ID : **41652953940**
Status : **Answered**

Chosen Option : **3**

Q.14 The total number of turns and cross-section area in a solenoid is fixed. However, its length L is varied by adjusting the separation between windings. The inductance of solenoid will be proportional to :

Options
1. L
2. L^2
3. $1/L^2$
4. $1/L$

Question Type : **MCQ**
Question ID : **41652913796**
Option 1 ID : **41652953962**
Option 2 ID : **41652953963**
Option 3 ID : **41652953964**
Option 4 ID : **41652953965**
Status : **Answered**
Chosen Option : **1**

Q.15 If 'M' is the mass of water that rises in a capillary tube of radius 'r', then mass of water which will rise in a capillary tube of radius '2r' is :

Options
1. M
2. $\dfrac{M}{2}$
3. 4 M
4. 2 M

Question Type : **MCQ**
Question ID : **41652913804**
Option 1 ID : **41652953996**
Option 2 ID : **41652953997**
Option 3 ID : **41652953994**
Option 4 ID : **41652953995**
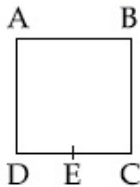Status : **Answered**
Chosen Option : **3**

Q.16 A stationary horizontal disc is free to rotate about its axis. When a torque is applied on it, its kinetic energy as a function of θ, where θ is the angle by which it has rotated, is given as $k\theta^2$. If its moment of inertia is I then the angular acceleration of the disc is :

Options
1. $\dfrac{k}{4I}\theta$

2. $\dfrac{k}{I}\theta$

3. $\dfrac{k}{2I}\theta$

4. $\dfrac{2k}{I}\theta$

Question Type : **MCQ**
Question ID : **41652913782**
Option 1 ID : **41652953909**
Option 2 ID : **41652953906**
Option 3 ID : **41652953908**
Option 4 ID : **41652953907**
Status : **Answered**
Chosen Option : **4**

Q.17 A wire of resistance R is bent to form a square ABCD as shown in the figure. The effective resistance between E and C is : (E is mid-point of arm CD)

Options 1. R

2. $\dfrac{7}{64} R$

3. $\dfrac{3}{4} R$

4. $\dfrac{1}{16} R$

Question Type : **MCQ**
Question ID : **41652913792**
Option 1 ID : **41652953949**
Option 2 ID : **41652953948**
Option 3 ID : **41652953946**
Option 4 ID : **41652953947**
Status : **Answered**
Chosen Option : **1**

Q.18 The pressure wave,
$P = 0.01 \sin[1000t - 3x]\,\mathrm{Nm}^{-2}$, corresponds to the sound produced by a vibrating blade on a day when atmospheric temperature is 0°C. On some other day when temperature is T, the speed of sound produced by the same blade and at the same frequency is found to be $336\ \mathrm{ms}^{-1}$. Approximate value of T is :

Options 1. 4°C

2. 11°C

3. 12°C

4. 15°C

Question Type : **MCQ**

Question ID : **41652913789**

Option 1 ID : **41652953937**

Option 2 ID : **41652953935**

Option 3 ID : **41652953934**

Option 4 ID : **41652953936**

Status : **Answered**

Chosen Option : **3**

Q.19 A solid sphere of mass 'M' and radius 'a' is surrounded by a uniform concentric spherical shell of thickness 2a and mass 2M. The gravitational field at distance '3a' from the centre will be :

Options

1. $\dfrac{2GM}{9a^2}$

2. $\dfrac{GM}{9a^2}$

3. $\dfrac{GM}{3a^2}$

4. $\dfrac{2GM}{3a^2}$

Question Type : **MCQ**

Question ID : **41652913783**

Option 1 ID : **41652953911**

Option 2 ID : **41652953910**

Option 3 ID : **41652953912**

Option 4 ID : **41652953913**

Status : **Answered**

Chosen Option : **3**

Q.20 For a given gas at 1 atm pressure, rms speed of the molecules is 200 m/s at 127 °C. At 2 atm pressure and at 227 °C, the rms speed of the molecules will be :

Options 1. 100 m/s

2. $80\sqrt{5}$ m/s

3. $100\sqrt{5}$ m/s

4. 80 m/s

Question Type : **MCQ**

Question ID : **41652913784**

Option 1 ID : **41652953916**

Option 2 ID : **41652953915**

Option 3 ID : **41652953914**
Option 4 ID : **41652953917**
Status : **Answered**
Chosen Option : **3**

Q.21 The magnetic field of a plane electromagnetic wave is given by :

$$\vec{B} = B_0\, \hat{i}\,\big[\cos(kz - \omega t)\big] + B_1\, \hat{j}\cos(kz + \omega t)$$

where $B_0 = 3 \times 10^{-5}$ T and $B_1 = 2 \times 10^{-6}$ T. The rms value of the force experienced by a stationary charge $Q = 10^{-4}$ C at $z = 0$ is closest to :

Options
1. 0.6 N

2. 0.1 N

3. 0.9 N

4. 3×10^{-2} N

Question Type : **MCQ**
Question ID : **41652913797**
Option 1 ID : **41652953966**
Option 2 ID : **41652953969**
Option 3 ID : **41652953968**
Option 4 ID : **41652953967**
Status : **Not Answered**
Chosen Option : **--**

Q.22 A moving coil galvanometer has resistance 50 Ω and it indicates full deflection at 4 mA current. A voltmeter is made using this galvanometer and a 5 kΩ resistance. The maximum voltage, that can be measured using this voltmeter, will be close to :

Options
1. 40 V

2. 15 V

3. 20 V

4. 10 V

Question Type : **MCQ**
Question ID : **41652913805**
Option 1 ID : **41652954001**
Option 2 ID : **41652953999**
Option 3 ID : **41652954000**
Option 4 ID : **41652953998**
Status : **Answered**
Chosen Option : **3**

Q.23

The stream of a river is flowing with a speed of 2 km/h. A swimmer can swim at a speed of 4 km/h. What should be the direction of the swimmer with respect to the flow of the river to cross the river straight ?

Options 1. 90°

2. 150°

3. 120°

4. 60°

Question Type : **MCQ**
Question ID : **41652913777**
Option 1 ID : **41652953888**
Option 2 ID : **41652953886**
Option 3 ID : **41652953889**
Option 4 ID : **41652953887**
Status : **Answered**
Chosen Option : **3**

Q.24 An NPN transistor is used in common emitter configuration as an amplifier with 1 kΩ load resistance. Signal voltage of 10 mV is applied across the base-emitter. This produces a 3 mA change in the collector current and 15 μA change in the base current of the amplifier. The input resistance and voltage gain are :

Options 1. 0.33 kΩ, 1.5

2. 0.67 kΩ, 300

3. 0.67 kΩ, 200

4. 0.33 kΩ, 300

Question Type : **MCQ**
Question ID : **41652913802**
Option 1 ID : **41652953987**
Option 2 ID : **41652953988**
Option 3 ID : **41652953989**
Option 4 ID : **41652953986**
Status : **Answered**
Chosen Option : **1**

Q.25 A rectangular coil (Dimension 5 cm×2.5 cm) with 100 turns, carrying a current of 3 A in the clock-wise direction, is kept centered at the origin and in the X-Z plane. A magnetic field of 1 T is applied along X-axis. If the coil is tilted through 45° about Z-axis, then the torque on the coil is :

Options
1. 0.38 Nm

2. 0.55 Nm

3. 0.42 Nm

4. 0.27 Nm

Question Type : **MCQ**
Question ID : **41652913794**
Option 1 ID : **41652953956**
Option 2 ID : **41652953955**
Option 3 ID : **41652953957**
Option 4 ID : **41652953954**
Status : **Answered**
Chosen Option : **1**

Q.26 A signal $A\cos\omega t$ is transmitted using $v_0\sin\omega_0 t$ as carrier wave. The correct amplitude modulated (AM) signal is :

Options
1. $v_0\sin\omega_0 t + \dfrac{A}{2}\sin(\omega_0 - \omega)t + \dfrac{A}{2}\sin(\omega_0 + \omega)t$

2. $v_0\sin[\omega_0(1 + 0.01A\sin\omega t)t]$

3. $v_0\sin\omega_0 t + A\cos\omega t$

4. $(v_0 + A)\cos\omega t\ \sin\omega_0 t$

Question Type : **MCQ**
Question ID : **41652913803**
Option 1 ID : **41652953992**
Option 2 ID : **41652953993**
Option 3 ID : **41652953990**
Option 4 ID : **41652953991**
Status : **Answered**
Chosen Option : **2**

Q.27 A rigid square loop of side 'a' and carrying current I_2 is lying on a horizontal surface near a long current I_1 carrying wire in the same plane as shown in figure. The net force on the loop due to the wire will be :
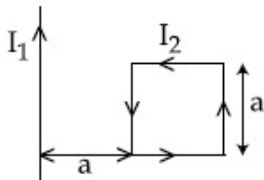
Options
1. Repulsive and equal to $\dfrac{\mu_o I_1 I_2}{2\pi}$

2. Attractive and equal to $\dfrac{\mu_o I_1 I_2}{3\pi}$

3. Repulsive and equal to $\dfrac{\mu_o I_1 I_2}{4\pi}$

4. Zero

Question Type : **MCQ**
Question ID : **41652913795**
Option 1 ID : **41652953961**
Option 2 ID : **41652953959**
Option 3 ID : **41652953960**
Option 4 ID : **41652953958**
Status : **Answered**
Chosen Option : **1**

Q.28 A concave mirror for face viewing has focal length of 0.4 m. The distance at which you hold the mirror from your face in order to see your image upright with a magnification of 5 is :

Options
1. 0.24 m

2. 1.60 m

3. 0.32 m

4. 0.16 m

Question Type : **MCQ**
Question ID : **41652913798**
Option 1 ID : **41652953973**
Option 2 ID : **41652953971**
Option 3 ID : **41652953972**
Option 4 ID : **41652953970**
Status : **Answered**
Chosen Option : **3**

Q.29 A ball is thrown vertically up (taken as $+z$-axis) from the ground. The correct momentum-height (p-h) diagram is :

Options

1.

2.

3.

4.

Question Type : **MCQ**
Question ID : **41652913778**
Option 1 ID : **41652953890**
Option 2 ID : **41652953891**

Option 3 ID : **41652953893**

Option 4 ID : **41652953892**

Status : **Answered**

Chosen Option : **4**

Q.30 The figure shows a Young's double slit experimental setup. It is observed that when a thin transparent sheet of thickness t and refractive index μ is put in front of one of the slits, the central maximum gets shifted by a distance equal to n fringe widths. If the wavelength of light used is λ, t will be :
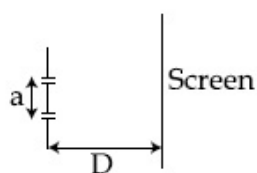
Options

1. $\dfrac{2nD\lambda}{a(\mu - 1)}$

2. $\dfrac{nD\lambda}{a(\mu - 1)}$

3. $\dfrac{D\lambda}{a(\mu - 1)}$

4. $\dfrac{2D\lambda}{a(\mu - 1)}$

Question Type : **MCQ**

Question ID : **41652913799**

Option 1 ID : **41652953977**

Option 2 ID : **41652953975**

Option 3 ID : **41652953974**

Option 4 ID : **41652953976**

Status : **Answered**

Chosen Option : **2**

Section : **Chemistry**

Q.1 The element having greatest difference between its first and second ionization energies, is :

Options

1. Ca

2. Sc

3. Ba

4. K

Question Type : **MCQ**

Question ID : **41652913816**

Option 1 ID : **41652954043**

Option 2 ID : **41652954045**

Option 3 ID : **41652954044**

Option 4 ID : **41652954042**
Status : **Answered**
Chosen Option : **4**

Q.2 The increasing order of reactivity of the following compounds towards aromatic electrophilic substitution reaction is :
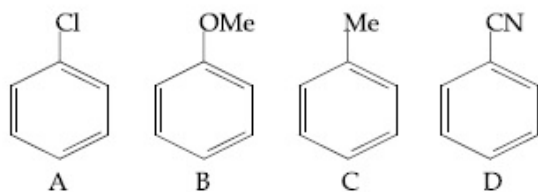
A   B   C   D

Options 1. $D < A < C < B$

2. $B < C < A < D$

3. $A < B < C < D$

4. $D < B < A < C$

Question Type : **MCQ**
Question ID : **41652913807**
Option 1 ID : **41652954007**
Option 2 ID : **41652954009**
Option 3 ID : **41652954006**
Option 4 ID : **41652954008**
Status : **Answered**
Chosen Option : **1**

Q.3 Consider the van der Waals constants, a and b, for the following gases.

Gas	Ar	Ne	Kr	Xe
$a/(\text{atm dm}^6 \text{ mol}^{-2})$	1.3	0.2	5.1	4.1
$b/(10^{-2} \text{ dm}^3 \text{ mol}^{-1})$	3.2	1.7	1.0	5.0

Which gas is expected to have the highest critical temperature ?

Options 1. Kr

2. Ne

3. Xe

4. Ar

Question Type : **MCQ**
Question ID : **41652913827**
Option 1 ID : **41652954088**
Option 2 ID : **41652954087**
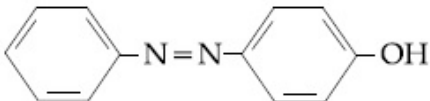Option 3 ID : **41652954089**
Option 4 ID : **41652954086**
Status : **Answered**
Chosen Option : **3**

Q.4

The given plots represent the variation of the concentration of a reactant R with time for two different reactions (i) and (ii). The respective orders of the reactions are :
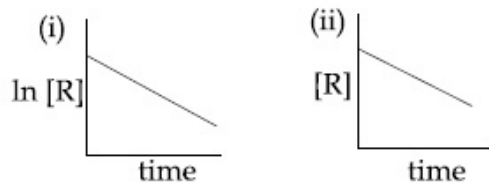
Options
1. 1, 0
2. 1, 1
3. 0, 1
4. 0, 2

Question Type : **MCQ**
Question ID : **41652913834**
Option 1 ID : **41652954115**
Option 2 ID : **41652954116**
Option 3 ID : **41652954114**
Option 4 ID : **41652954117**
Status : **Answered**
Chosen Option : **1**

Q.5 Among the following, the set of parameters that represents path functions, is :

(A) q + w
(B) q
(C) w
(D) H − TS

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

Question Type : **MCQ**
Question ID : **41652913830**
Option 1 ID : **41652954099**
Option 2 ID : **41652954100**
Option 3 ID : **41652954098**
Option 4 ID : **41652954101**
Status : **Answered**
Chosen Option : **1**

Q.6 The ore that contains the metal in the form of fluoride is :

Options
1. cryolite
2. malachite
3. magnetite

4. sphalerite

Question Type : **MCQ**
Question ID : **41652913817**
Option 1 ID : **41652954047**
Option 2 ID : **41652954049**
Option 3 ID : **41652954048**
Option 4 ID : **41652954046**
Status : **Answered**
Chosen Option : **1**

Q.7 Excessive release of CO_2 into the atmosphere results in :

Options
1. global warming

2. polar vortex

3. formation of smog

4. depletion of ozone

Question Type : **MCQ**
Question ID : **41652913825**
Option 1 ID : **41652954080**
Option 2 ID : **41652954081**
Option 3 ID : **41652954079**
Option 4 ID : **41652954078**
Status : **Answered**
Chosen Option : **1**
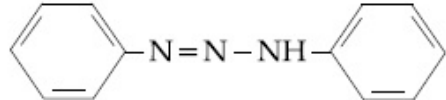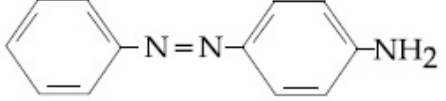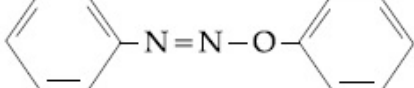
Q.8 Aniline dissolved in dilute HCl is reacted with sodium nitrite at 0°C . This solution was added dropwise to a solution containing equimolar mixture of aniline and phenol in dil. HCl. The structure of the major product is :

Options

1. (phenyl)—N=N—(phenyl)—OH

2. (phenyl)—N=N—NH—(phenyl)

3. (phenyl)—N=N—(phenyl)—NH$_2$

4. (phenyl)—N=N—O—(phenyl)

Question Type : **MCQ**
Question ID : **41652913815**
Option 1 ID : **41652954041**
Option 2 ID : **41652954038**
Option 3 ID : **41652954040**
Option 4 ID : **41652954039**
Status : **Answered**

Chosen Option : **1**

Q.9 Among the following, the molecule expected to be stabilized by anion formation is :

C_2, O_2, NO, F_2

Options 1. C_2

2. F_2

3. NO

4. O_2

Question Type : **MCQ**
Question ID : **41652913829**
Option 1 ID : **41652954095**
Option 2 ID : **41652954097**
Option 3 ID : **41652954096**
Option 4 ID : **41652954094**
Status : **Answered**
Chosen Option : **1**

Q.10 The **correct** order of the oxidation states of nitrogen in NO, N_2O, NO_2 and N_2O_3 is :

Options 1. $NO_2 < NO < N_2O_3 < N_2O$

2. $NO_2 < N_2O_3 < NO < N_2O$

3. $N_2O < N_2O_3 < NO < NO_2$

4. $N_2O < NO < N_2O_3 < NO_2$

Question Type : **MCQ**
Question ID : **41652913820**
Option 1 ID : **41652954058**
Option 2 ID : **41652954059**
Option 3 ID : **41652954061**
Option 4 ID : **41652954060**
Status : **Answered**
Chosen Option : **4**

Q.11 Liquid 'M' and liquid 'N' form an ideal solution. The vapour pressures of pure liquids 'M' and 'N' are 450 and 700 mmHg, respectively, at the same temperature. Then **correct** statement is :

(x_M = Mole fraction of 'M' in solution;

x_N = Mole fraction of 'N' in solution;

y_M = Mole fraction of 'M' in vapour phase;

y_N = Mole fraction of 'N' in vapour phase)

Options 1. $\dfrac{x_M}{x_N} = \dfrac{y_M}{y_N}$

2. $(x_M - y_M) < (x_N - y_N)$

3. $\dfrac{x_M}{x_N} < \dfrac{y_M}{y_N}$

4. $\dfrac{x_M}{x_N} > \dfrac{y_M}{y_N}$

Question Type : **MCQ**
Question ID : **41652913831**
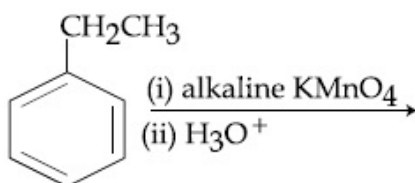Option 1 ID : **41652954102**
Option 2 ID : **41652954105**
Option 3 ID : **41652954104**
Option 4 ID : **41652954103**
Status : **Answered**
Chosen Option : **4**

Q.12 The osmotic pressure of a dilute solution of an ionic compound XY in water is four times that of a solution of 0.01 M $BaCl_2$ in water. Assuming complete dissociation of the given ionic compounds in water, the concentration of XY (in $mol\,L^{-1}$) in solution is :

Options 1. 4×10^{-2}

2. 6×10^{-2}

3. 4×10^{-4}

4. 16×10^{-4}

Question Type : **MCQ**
Question ID : **41652913832**
Option 1 ID : **41652954106**
Option 2 ID : **41652954108**
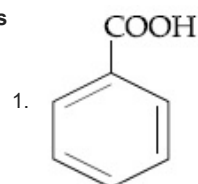Option 3 ID : **41652954109**
Option 4 ID : **41652954107**
Status : **Answered**
Chosen Option : **2**

Q.13 The number of water molecule(s) **not** coordinated to copper ion directly in $CuSO_4 \cdot 5H_2O$, is :

Options 1. 2

2. 3

3. 1

4. 4

Question Type : **MCQ**
Question ID : **41652913818**
Option 1 ID : **41652954051**
Option 2 ID : **41652954052**
Option 3 ID : **41652954050**
Option 4 ID : **41652954053**
Status : **Answered**

	Chosen Option : **2**

Q.14

The standard Gibbs energy for the given cell reaction in kJ mol^{-1} at 298 K is :

$Zn(s) + Cu^{2+}(aq) \rightarrow Zn^{2+}(aq) + Cu(s),$
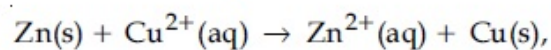
$E^o = 2$ V at 298 K

(Faraday's constant, $F = 96000$ C mol^{-1})

Options
1. -384

2. 384

3. 192

4. -192
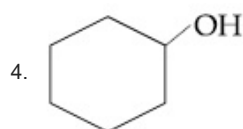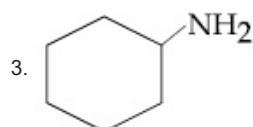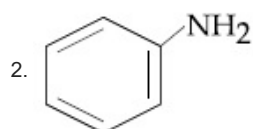
Question Type : **MCQ**
Question ID : **41652913833**
Option 1 ID : **41652954112**
Option 2 ID : **41652954111**
Option 3 ID : **41652954110**
Option 4 ID : **41652954113**
Status : **Answered**
Chosen Option : **1**

Q.15

The major product of the following reaction is :

$\xrightarrow[\text{(ii) } H_3O^+]{\text{(i) alkaline } KMnO_4}$

Options

1. (COOH on benzene ring)

2. (CH$_2$CHO on benzene ring)

3. (CH$_2$COOH on benzene ring)

4. (COCH$_3$ on benzene ring)
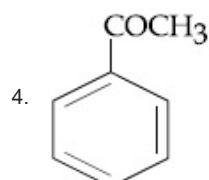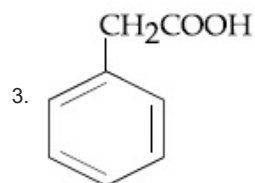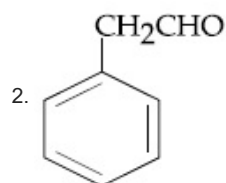
Question Type : **MCQ**
Question ID : **41652913812**
Option 1 ID : **41652954027**
Option 2 ID : **41652954028**
Option 3 ID : **41652954029**
Option 4 ID : **41652954026**
Status : **Answered**
Chosen Option : **1**

Q.16 For any given series of spectral lines of atomic hydrogen, let $\Delta\bar{v} = \bar{v}_{max} - \bar{v}_{min}$ be the difference in maximum and minimum frequencies in cm^{-1}. The ratio $\Delta\bar{v}_{Lyman}/\Delta\bar{v}_{Balmer}$ is :

Options
1. $4:1$
2. $9:4$
3. $5:4$
4. $27:5$

Question Type : **MCQ**
Question ID : **41652913828**
Option 1 ID : **41652954091**
Option 2 ID : **41652954092**
Option 3 ID : **41652954093**
Option 4 ID : **41652954090**
Status : **Answered**
Chosen Option : **2**

Q.17 The organic compound that gives following qualitative analysis is :

	Test	Inference
(a)	Dil. HCl	Insoluble
(b)	NaOH solution	soluble
(c)	Br_2/water	Decolourization

Options

1.

2.

3.

4.
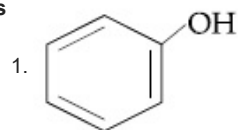
Question Type : **MCQ**

Question ID : **41652913813**
Option 1 ID : **41652954032**
Option 2 ID : **41652954031**
Option 3 ID : **41652954033**
Option 4 ID : **41652954030**
Status : **Answered**
Chosen Option : **1**

Q.18 C_{60}, an allotrope of carbon contains :

Options 1. 12 hexagons and 20 pentagons.

2. 18 hexagons and 14 pentagons.

3. 16 hexagons and 16 pentagons.

4. 20 hexagons and 12 pentagons.

Question Type : **MCQ**
Question ID : **41652913821**
Option 1 ID : **41652954063**
Option 2 ID : **41652954065**
Option 3 ID : **41652954064**
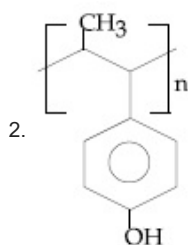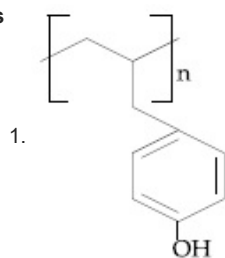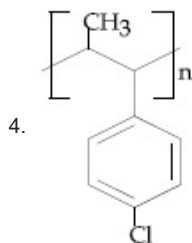Option 4 ID : **41652954062**
Status : **Answered**
Chosen Option : **4**

Q.19 The major product of the following reaction is :
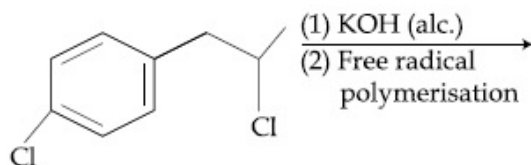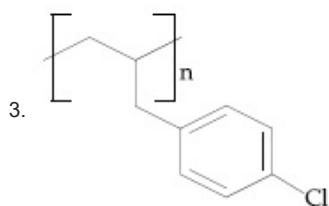
Options

1.

2.

3.

4.

Q.20 The one that will show optical activity is :

(en = ethane-1,2-diamine)

Options
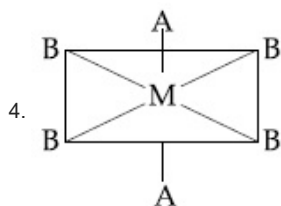
1.

2.

3.

4.

Q.21

The **correct** IUPAC name of the following compound is :

Options
1. 5-chloro-4-methyl-1-nitrobenzene

2. 2-chloro-1-methyl-4-nitrobenzene
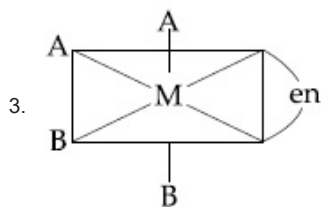
3. 3-chloro-4-methyl-1-nitrobenzene
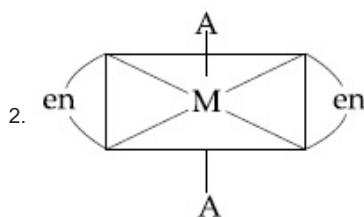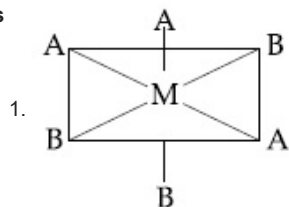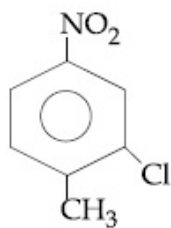
4. 2-methyl-5-nitro-1-chlorobenzene

Question Type : **MCQ**
Question ID : **41652913814**
Option 1 ID : **41652954034**
Option 2 ID : **41652954035**
Option 3 ID : **41652954037**
Option 4 ID : **41652954036**
Status : **Answered**
Chosen Option : **3**

Q.22 Match the catalysts (**Column I**) with products (**Column II**).

	Column I		Column II
	Catalyst		Product
(A)	V_2O_5	(i)	Polyethylene
(B)	$TiCl_4/Al(Me)_3$	(ii)	ethanal
(C)	$PdCl_2$	(iii)	H_2SO_4
(D)	Iron Oxide	(iv)	NH_3

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

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

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

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

Question Type : **MCQ**
Question ID : **41652913822**
Option 1 ID : **41652954068**
Option 2 ID : **41652954066**
Option 3 ID : **41652954069**
Option 4 ID : **41652954067**
Status : **Answered**
Chosen Option : **3**

Q.23 Which of the following statements is **not** true about sucrose ?

Options
1. It is a non reducing sugar

The glycosidic linkage is present
2. between C_1 of α-glucose and C_1 of β-fructose

3. It is also named as invert sugar

4. On hydrolysis, it produces glucose and fructose

Question Type : **MCQ**
Question ID : **41652913809**
Option 1 ID : **41652954015**
Option 2 ID : **41652954016**
Option 3 ID : **41652954017**
Option 4 ID : **41652954014**
Status : **Answered**
Chosen Option : **2**

Q.24 Magnesium powder burns in air to give :

Options
1. $Mg(NO_3)_2$ and Mg_3N_2

2. MgO and Mg_3N_2

3. MgO only

4. MgO and $Mg(NO_3)_2$

Question Type : **MCQ**
Question ID : **41652913819**
Option 1 ID : **41652954055**
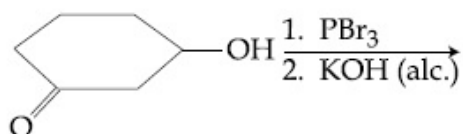Option 2 ID : **41652954056**
Option 3 ID : **41652954054**
Option 4 ID : **41652954057**
Status : **Answered**
Chosen Option : **2**

Q.25 The major product of the following reaction is :

Options

1.

2.

3.

4.

Q.26 The major product of the following reaction
is :

$$CH_3C\equiv CH \xrightarrow[\text{(ii) DI}]{\text{(i) DCl (1 equiv.)}}$$
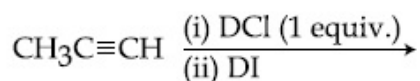
Options
1. $CH_3CD(I)CHD(Cl)$

2. $CH_3CD(Cl)CHD(I)$

3. $CH_3CD_2CH(Cl)(I)$

4. $CH_3C(I)(Cl)CHD_2$

Q.27 The major product of the following reaction
is :

$$CH_3CH=CHCO_2CH_3 \xrightarrow{\text{LiAlH}_4}$$

Options
1. $CH_3CH_2CH_2CO_2CH_3$

2. $CH_3CH=CHCH_2OH$

3. $CH_3CH_2CH_2CH_2OH$

4. $CH_3CH_2CH_2CHO$

Q.28

The degenerate orbitals of $[Cr(H_2O)_6]^{3+}$ are :

Options 1. d_{xz} and d_{yz}

2. d_{yz} and d_{z^2}

3. d_{z^2} and d_{xz}

4. $d_{x^2-y^2}$ and d_{xy}

Question Type : **MCQ**

Question ID : **41652913824**

Option 1 ID : **41652954075**

Option 2 ID : **41652954077**

Option 3 ID : **41652954076**
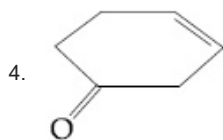
Option 4 ID : **41652954074**

Status : **Answered**

Chosen Option : **1**

Q.29   The aerosol is a kind of colloid in which :

Options 1. solid is dispersed in gas

2. gas is dispersed in solid

3. gas is dispersed in liquid

4. liquid is dispersed in water

Question Type : **MCQ**

Question ID : **41652913835**

Option 1 ID : **41652954121**

Option 2 ID : **41652954120**

Option 3 ID : **41652954119**

Option 4 ID : **41652954118**

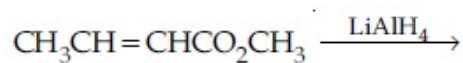Status : **Answered**

Chosen Option : **3**

Q.30   For a reaction,

$N_2(g) + 3\,H_2(g) \rightarrow 2\,NH_3(g)$;   identify dihydrogen (H_2) as a limiting reagent in the following reaction mixtures.

Options 1. 56 g of N_2 + 10 g of H_2

2. 35 g of N_2 + 8 g of H_2

3. 28 g of N_2 + 6 g of H_2

4. 14 g of N_2 + 4 g of H_2

Question Type : **MCQ**

Question ID : **41652913826**

Option 1 ID : **41652954085**

Option 2 ID : **41652954084**

Option 3 ID : **41652954083**

Option 4 ID : **41652954082**

Status : **Answered**

Chosen Option : **1**

Section : **Mathematics**

Q.1 Slope of a line passing through P(2, 3) and intersecting the line, $x + y = 7$ at a distance of 4 units from P, is :

Options

1. $\dfrac{1-\sqrt{5}}{1+\sqrt{5}}$

2. $\dfrac{1-\sqrt{7}}{1+\sqrt{7}}$

3. $\dfrac{\sqrt{7}-1}{\sqrt{7}+1}$

4. $\dfrac{\sqrt{5}-1}{\sqrt{5}+1}$

Question Type : **MCQ**
Question ID : **41652913854**
Option 1 ID : **41652954195**
Option 2 ID : **41652954197**
Option 3 ID : **41652954196**
Option 4 ID : **41652954194**
Status : **Answered**
Chosen Option : **2**

Q.2 If the standard deviation of the numbers $-1, 0, 1, k$ is $\sqrt{5}$ where $k > 0$, then k is equal to :

Options

1. $2\sqrt{6}$

2. $2\sqrt{\dfrac{10}{3}}$

3. $4\sqrt{\dfrac{5}{3}}$

4. $\sqrt{6}$

Question Type : **MCQ**
Question ID : **41652913862**
Option 1 ID : **41652954228**
Option 2 ID : **41652954227**
Option 3 ID : **41652954229**
Option 4 ID : **41652954226**
Status : **Answered**
Chosen Option : **1**

Q.3 If $f(x)$ is a non-zero polynomial of degree four, having local extreme points at $x = -1, 0, 1$; then the set

$$S = \{x \in \mathbf{R} : f(x) = f(0)\}$$

contains exactly :

Options 1. four irrational numbers.

2. four rational numbers.

3. two irrational and two rational numbers.

4. two irrational and one rational number.

Question Type : **MCQ**

Question ID : **41652913848**

Option 1 ID : **41652954173**

Option 2 ID : **41652954172**

Option 3 ID : **41652954170**

Option 4 ID : **41652954171**

Status : **Answered**

Chosen Option : **3**

Q.4 The integral $\int \sec^{2/3}x \, \csc^{4/3}x \, dx$ is equal to :

(Here C is a constant of integration)

Options 1. $-3 \tan^{-1/3}x + C$

2. $-\dfrac{3}{4} \tan^{-4/3}x + C$

3. $-3 \cot^{-1/3}x + C$

4. $3 \tan^{-1/3}x + C$

Question Type : **MCQ**

Question ID : **41652913849**

Option 1 ID : **41652954175**

Option 2 ID : **41652954176**

Option 3 ID : **41652954174**

Option 4 ID : **41652954177**

Status : **Answered**

Chosen Option : **1**

Q.5 Four persons can hit a target correctly with probabilities $\dfrac{1}{2}, \dfrac{1}{3}, \dfrac{1}{4}$ and $\dfrac{1}{8}$ respectively.

If all hit at the target independently, then the probability that the target would be hit, is :

Options 1. $\dfrac{25}{192}$

2. $\dfrac{7}{32}$

3. $\dfrac{1}{192}$

4. $\dfrac{25}{32}$

Q.6

If the line, $\dfrac{x-1}{2} = \dfrac{y+1}{3} = \dfrac{z-2}{4}$ meets the plane, $x+2y+3z=15$ at a point P, then the distance of P from the origin is :

Options 1. $\sqrt{5}/2$

2. $2\sqrt{5}$

3. $9/2$

4. $7/2$

Q.7

If the tangent to the curve, $y = x^3 + ax - b$ at the point $(1, -5)$ is perpendicular to the line, $-x + y + 4 = 0$, then which one of the following points lies on the curve ?

Options 1. $(-2, 1)$

2. $(-2, 2)$

3. $(2, -1)$

4. $(2, -2)$

Q.8

The value of $\displaystyle\int_{0}^{\pi/2} \dfrac{\sin^3 x}{\sin x + \cos x}\, dx$ is :

Options 1. $\dfrac{\pi - 2}{8}$

2. $\dfrac{\pi-1}{4}$

3. $\dfrac{\pi-2}{4}$

4. $\dfrac{\pi-1}{2}$

Question Type : **MCQ**
Question ID : **41652913850**
Option 1 ID : **41652954180**
Option 2 ID : **41652954179**
Option 3 ID : **41652954181**
Option 4 ID : **41652954178**
Status : **Answered**
Chosen Option : **2**

Q.9 The value of

$\cos^2 10° - \cos 10° \cos 50° + \cos^2 50°$ is :

Options

1. $\dfrac{3}{4} + \cos 20°$

2. $3/4$

3. $\dfrac{3}{2}(1 + \cos 20°)$

4. $3/2$

Question Type : **MCQ**
Question ID : **41652913863**
Option 1 ID : **41652954230**
Option 2 ID : **41652954231**
Option 3 ID : **41652954232**
Option 4 ID : **41652954233**
Status : **Answered**
Chosen Option : **2**

Q.10 If the line $y = mx + 7\sqrt{3}$ is normal to the

hyperbola $\dfrac{x^2}{24} - \dfrac{y^2}{18} = 1$, then a value of

m is :

Options

1. $\dfrac{\sqrt{5}}{2}$

2. $\dfrac{\sqrt{15}}{2}$

3. $\dfrac{2}{\sqrt{5}}$

4. $\dfrac{3}{\sqrt{5}}$

Question Type : **MCQ**
Question ID : **41652913857**
Option 1 ID : **41652954207**

Option 2 ID : **41652954209**
Option 3 ID : **41652954206**
Option 4 ID : **41652954208**
Status : **Answered**
Chosen Option : **1**

Q.11
The solution of the differential equation

$$x\frac{dy}{dx} + 2y = x^2 \ (x \neq 0) \text{ with } y(1) = 1, \text{ is :}$$

Options

1. $y = \dfrac{4}{5}x^3 + \dfrac{1}{5x^2}$

2. $y = \dfrac{x^3}{5} + \dfrac{1}{5x^2}$

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

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

Question Type : **MCQ**
Question ID : **41652913852**
Option 1 ID : **41652954187**
Option 2 ID : **41652954189**
Option 3 ID : **41652954188**
Option 4 ID : **41652954186**
Status : **Answered**
Chosen Option : **3**

Q.12
For any two statements p and q, the negation of the expression $p \vee (\sim p \wedge q)$ is :

Options 1. $\sim p \wedge \sim q$

2. $p \wedge q$

3. $p \leftrightarrow q$

4. $\sim p \vee \sim q$

Question Type : **MCQ**
Question ID : **41652913865**
Option 1 ID : **41652954238**
Option 2 ID : **41652954240**
Option 3 ID : **41652954241**
Option 4 ID : **41652954239**
Status : **Answered**
Chosen Option : **4**

Q.13
All the points in the set

$$S = \left\{ \frac{\alpha + i}{\alpha - i} : \alpha \in \mathbf{R} \right\} \ (i = \sqrt{-1}) \text{ lie on a :}$$

Options 1. straight line whose slope is 1.

2. circle whose radius is 1.

3. circle whose radius is $\sqrt{2}$.

4. straight line whose slope is -1.

Question Type : **MCQ**	
Question ID : **41652913837**	
Option 1 ID : **41652954128**	
Option 2 ID : **41652954127**	
Option 3 ID : **41652954126**	
Option 4 ID : **41652954129**	
Status : **Answered**	
Chosen Option : **2**	

Q.14 If the fourth term in the Binomial expansion

of $\left(\dfrac{2}{x} + x^{\log_8 x}\right)^6$ ($x > 0$) is 20×8^7, then a

value of x is :

Options 1. 8^3

2. 8^2

3. 8

4. 8^{-2}

Question Type : **MCQ**	
Question ID : **41652913844**	
Option 1 ID : **41652954156**	
Option 2 ID : **41652954154**	
Option 3 ID : **41652954155**	
Option 4 ID : **41652954157**	
Status : **Answered**	
Chosen Option : **2**	

Q.15

If the function f defined on $\left(\dfrac{\pi}{6}, \dfrac{\pi}{3}\right)$ by

$$f(x) = \begin{cases} \dfrac{\sqrt{2}\cos x - 1}{\cot x - 1}, & x \neq \dfrac{\pi}{4} \\ k, & x = \dfrac{\pi}{4} \end{cases}$$

is continuous, then k is equal to :

Options 1. 2

2. $\dfrac{1}{2}$

3. 1

4. $\dfrac{1}{\sqrt{2}}$

Question Type : **MCQ**	
Question ID : **41652913845**	
Option 1 ID : **41652954158**	
Option 2 ID : **41652954159**	
Option 3 ID : **41652954160**	

Option 4 ID : **41652954161**

Status : **Answered**

Chosen Option : **4**

Q.16 If the function $f : \mathbf{R} - \{1, -1\} \to A$ defined

by $f(x) = \dfrac{x^2}{1 - x^2}$, is surjective, then A is

equal to :

Options 1. $\mathbf{R} - \{-1\}$

2. $[0, \infty)$

3. $\mathbf{R} - [-1, 0)$

4. $\mathbf{R} - (-1, 0)$

Question Type : **MCQ**

Question ID : **41652913836**

Option 1 ID : **41652954123**

Option 2 ID : **41652954125**

Option 3 ID : **41652954122**

Option 4 ID : **41652954124**

Status : **Answered**

Chosen Option : **3**

Q.17 A plane passing through the points
$(0, -1, 0)$ and $(0, 0, 1)$ and making an angle

$\dfrac{\pi}{4}$ with the plane $y - z + 5 = 0$, also passes

through the point :

Options 1. $(-\sqrt{2}, 1, -4)$

2. $(\sqrt{2}, -1, 4)$

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

4. $(\sqrt{2}, 1, 4)$

Question Type : **MCQ**

Question ID : **41652913859**

Option 1 ID : **41652954216**

Option 2 ID : **41652954214**

Option 3 ID : **41652954215**

Option 4 ID : **41652954217**

Status : **Answered**

Chosen Option : **2**

Q.18 Let the sum of the first n terms of a
non-constant A.P., $a_1, a_2, a_3, \ldots\ldots$ be

$50n + \dfrac{n(n-7)}{2}A$, where A is a constant.

If d is the common difference of this A.P.,
then the ordered pair (d, a_{50}) is equal to :

Options 1. $(50, 50 + 46A)$

2. $(50, 50+45A)$

3. $(A, 50+45A)$

4. $(A, 50+46A)$

Question Type : **MCQ**
Question ID : **41652913842**
Option 1 ID : **41652954146**
Option 2 ID : **41652954149**
Option 3 ID : **41652954148**
Option 4 ID : **41652954147**
Status : **Answered**
Chosen Option : **4**

Q.19 Let $S=\{\theta \epsilon [-2\pi, 2\pi] : 2\cos^2\theta + 3\sin\theta = 0\}$.

Then the sum of the elements of S is :

Options

1. $\dfrac{13\pi}{6}$

2. $\dfrac{5\pi}{3}$

3. 2π

4. π

Question Type : **MCQ**
Question ID : **41652913864**
Option 1 ID : **41652954234**
Option 2 ID : **41652954235**
Option 3 ID : **41652954236**
Option 4 ID : **41652954237**
Status : **Answered**
Chosen Option : **3**

Q.20 Let $p, q \in R$. If $2 - \sqrt{3}$ is a root of the quadratic equation, $x^2 + px + q = 0$, then :

Options
1. $p^2 - 4q + 12 = 0$

2. $q^2 - 4p - 16 = 0$

3. $q^2 + 4p + 14 = 0$

4. $p^2 - 4q - 12 = 0$

Question Type : **MCQ**
Question ID : **41652913838**
Option 1 ID : **41652954130**
Option 2 ID : **41652954131**
Option 3 ID : **41652954133**
Option 4 ID : **41652954132**
Status : **Answered**
Chosen Option : **4**

Q.21 Let $f(x)=15-|x-10|$; $x \in R$. Then the set of all values of x, at which the function, $g(x) = f(f(x))$ is not differentiable, is :

Options 1. $\{5, 10, 15\}$

2. $\{10, 15\}$

3. $\{5, 10, 15, 20\}$

4. $\{10\}$

Question Type : **MCQ**
Question ID : **41652913846**
Option 1 ID : **41652954164**
Option 2 ID : **41652954163**
Option 3 ID : **41652954165**
Option 4 ID : **41652954162**
Status : **Answered**
Chosen Option : **1**

Q.22 Let S be the set of all values of x for which the tangent to the curve $y=f(x)=x^3-x^2-2x$ at (x, y) is parallel to the line segment joining the points $(1, f(1))$ and $(-1, f(-1))$, then S is equal to :

Options

1. $\left\{\dfrac{1}{3}, 1\right\}$

2. $\left\{-\dfrac{1}{3}, -1\right\}$

3. $\left\{\dfrac{1}{3}, -1\right\}$

4. $\left\{-\dfrac{1}{3}, 1\right\}$

Question Type : **MCQ**
Question ID : **41652913847**
Option 1 ID : **41652954166**
Option 2 ID : **41652954168**
Option 3 ID : **41652954167**
Option 4 ID : **41652954169**
Status : **Answered**
Chosen Option : **4**

Q.23 If a tangent to the circle $x^2+y^2=1$ intersects the coordinate axes at distinct points P and Q, then the locus of the mid-point of PQ is :

Options 1. $x^2+y^2-4x^2y^2=0$

2. $x^2+y^2-2xy=0$

3. $x^2+y^2-16x^2y^2=0$

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

Question Type : **MCQ**
Question ID : **41652913855**
Option 1 ID : **41652954200**

Option 2 ID : **41652954198**
Option 3 ID : **41652954201**
Option 4 ID : **41652954199**
Status : **Answered**
Chosen Option : **2**

Q.24

Let $\vec{\alpha} = 3\hat{i} + \hat{j}$ and $\vec{\beta} = 2\hat{i} - \hat{j} + 3\hat{k}$. If

$\vec{\beta} = \vec{\beta}_1 - \vec{\beta}_2$, where $\vec{\beta}_1$ is parallel to $\vec{\alpha}$

and $\vec{\beta}_2$ is perpendicular to $\vec{\alpha}$, then

$\vec{\beta}_1 \times \vec{\beta}_2$ is equal to :

Options

1. $-3\hat{i} + 9\hat{j} + 5\hat{k}$

2. $3\hat{i} - 9\hat{j} - 5\hat{k}$

3. $\dfrac{1}{2}(-3\hat{i} + 9\hat{j} + 5\hat{k})$

4. $\dfrac{1}{2}(3\hat{i} - 9\hat{j} + 5\hat{k})$

Question Type : **MCQ**
Question ID : **41652913860**
Option 1 ID : **41652954220**
Option 2 ID : **41652954221**
Option 3 ID : **41652954218**
Option 4 ID : **41652954219**
Status : **Answered**
Chosen Option : **3**

Q.25

The area (in sq. units) of the region
$A = \{(x, y) : x^2 \le y \le x + 2\}$ is :

Options

1. $\dfrac{10}{3}$

2. $\dfrac{9}{2}$

3. $\dfrac{31}{6}$

4. $\dfrac{13}{6}$

Question Type : **MCQ**
Question ID : **41652913851**
Option 1 ID : **41652954183**
Option 2 ID : **41652954185**
Option 3 ID : **41652954182**
Option 4 ID : **41652954184**
Status : **Answered**
Chosen Option : **2**

Q.26

If

$$\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix} \cdots \begin{bmatrix} 1 & n-1 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 78 \\ 0 & 1 \end{bmatrix},$$

then the inverse of $\begin{bmatrix} 1 & n \\ 0 & 1 \end{bmatrix}$ is :

Options

1. $\begin{bmatrix} 1 & 0 \\ 12 & 1 \end{bmatrix}$

2. $\begin{bmatrix} 1 & -13 \\ 0 & 1 \end{bmatrix}$

3. $\begin{bmatrix} 1 & -12 \\ 0 & 1 \end{bmatrix}$

4. $\begin{bmatrix} 1 & 0 \\ 13 & 1 \end{bmatrix}$

Question Type : **MCQ**
Question ID : **41652913840**
Option 1 ID : **41652954138**
Option 2 ID : **41652954140**
Option 3 ID : **41652954141**
Option 4 ID : **41652954139**
Status : **Answered**
Chosen Option : **2**

Q.27

Let $\displaystyle\sum_{k=1}^{10} f(a+k) = 16(2^{10}-1)$, where the

function f satisfies $f(x+y) = f(x)\,f(y)$ for all natural numbers x, y and $f(1) = 2$. Then the natural number 'a' is :

Options
1. 2

2. 16

3. 4

4. 3

Question Type : **MCQ**
Question ID : **41652913843**
Option 1 ID : **41652954150**
Option 2 ID : **41652954153**
Option 3 ID : **41652954152**
Option 4 ID : **41652954151**
Status : **Answered**
Chosen Option : **4**

Q.28

A committee of 11 members is to be formed from 8 males and 5 females. If m is the number of ways the committee is formed with at least 6 males and n is the number of ways the committee is formed with at least 3 females, then :

Options
1. $m + n = 68$

2. $m = n = 78$

3. $n = m - 8$

4. $m = n = 68$

Question Type : **MCQ**
Question ID : **41652913841**
Option 1 ID : **41652954145**
Option 2 ID : **41652954143**
Option 3 ID : **41652954142**
Option 4 ID : **41652954144**
Status : **Answered**
Chosen Option : **2**

Q.29 Let α and β be the roots of the equation $x^2 + x + 1 = 0$. Then for $y \neq 0$ in **R**,

$$\begin{vmatrix} y+1 & \alpha & \beta \\ \alpha & y+\beta & 1 \\ \beta & 1 & y+\alpha \end{vmatrix}$$ is equal to :

Options
1. $y(y^2 - 1)$

2. $y(y^2 - 3)$

3. y^3

4. $y^3 - 1$

Question Type : **MCQ**
Question ID : **41652913839**
Option 1 ID : **41652954136**
Option 2 ID : **41652954134**
Option 3 ID : **41652954137**
Option 4 ID : **41652954135**
Status : **Not Answered**
Chosen Option : **--**

Q.30 If one end of a focal chord of the parabola, $y^2 = 16x$ is at (1, 4), then the length of this focal chord is :

Options
1. 25

2. 22

3. 24

4. 20

Question Type : **MCQ**

Question ID : **41652913856**
Option 1 ID : **41652954202**
Option 2 ID : **41652954204**
Option 3 ID : **41652954203**
Option 4 ID : **41652954205**
Status : **Answered**
Chosen Option : **1**