

NTA JEE 7th to 9th Jan 2020

Application No.	
Candidate Name	
Roll No.	
Test Date	07/01/2020
Test Time	9:30 AM - 12:30 PM
Subject	BTECH

Section : Physics

Q.1 A 60 HP electric motor lifts an elevator having a maximum total load capacity of 2000 kg. If the frictional force on the elevator is 4000 N, the speed of the elevator at full load is close to : (1 HP = 746 W, $g = 10 \text{ ms}^{-2}$)

Options

1. 1.5 ms^{-1}
2. 1.7 ms^{-1}
3. 2.0 ms^{-1}
4. 1.9 ms^{-1}

Question Type : **MCQ**

Question ID : **4050363**

Option 1 ID : **40503612**

Option 2 ID : **40503611**

Option 3 ID : **4050369**

Option 4 ID : **40503610**

Status : **Not Answered**

Chosen Option : --

Q.2 Consider a circular coil of wire carrying constant current I , forming a magnetic dipole. The magnetic flux through an infinite plane that contains the circular coil and excluding the circular coil area is given by ϕ_i . The magnetic flux through the area of the circular coil area is given by ϕ_0 . Which of the following option is correct ?

- Options
1. $\phi_i = \phi_0$
 2. $\phi_i < \phi_0$
 3. $\phi_i > \phi_0$
 4. $\phi_i = -\phi_0$

Question Type : **MCQ**

Question ID : **40503613**

Option 1 ID : **40503649**

Option 2 ID : **40503650**

Option 3 ID : **40503651**

Option 4 ID : **40503652**

Status : **Marked For Review**

Chosen Option : **2**

Q.3 A polarizer - analyser set is adjusted such that the intensity of light coming out of the analyser is just 10% of the original intensity. Assuming that the polarizer - analyser set does not absorb any light, the angle by which the analyser need to be rotated further to reduce the output intensity to be zero, is :

- Options
1. 71.6°
 2. 90°
 3. 18.4°
 4. 45°

Question Type : **MCQ**

Question ID : **40503617**

Option 1 ID : **40503667**

Option 2 ID : **40503665**

Option 3 ID : **40503666**

Option 4 ID : **40503668**

Status : **Not Answered**

Chosen Option : **--**

Q.4 A long solenoid of radius R carries a time (t) - dependent current $I(t) = I_0 t(1 - t)$. A ring of radius $2R$ is placed coaxially near its middle. During the time interval $0 \leq t \leq 1$, the induced current (I_R) and the induced EMF (V_R) in the ring change as :

- Options**
1. Direction of I_R remains unchanged and V_R is zero at $t = 0.25$
 2. Direction of I_R remains unchanged and V_R is maximum at $t = 0.5$
 3. At $t = 0.25$ direction of I_R reverses and V_R is maximum
 4. At $t = 0.5$ direction of I_R reverses and V_R is zero

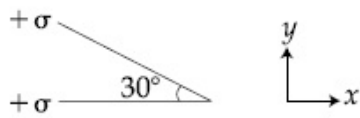
Question Type : **MCQ**
 Question ID : **40503614**
 Option 1 ID : **40503655**
 Option 2 ID : **40503653**
 Option 3 ID : **40503656**
 Option 4 ID : **40503654**
 Status : **Not Answered**
 Chosen Option : --

Q.5 The radius of gyration of a uniform rod of length l , about an axis passing through a point $\frac{l}{4}$ away from the centre of the rod, and perpendicular to it, is :

- Options**
1. $\frac{1}{8} l$
 2. $\sqrt{\frac{7}{48}} l$
 3. $\sqrt{\frac{3}{8}} l$
 4. $\frac{1}{4} l$

Question Type : **MCQ**
 Question ID : **4050365**
 Option 1 ID : **40503620**
 Option 2 ID : **40503619**
 Option 3 ID : **40503618**
 Option 4 ID : **40503617**
 Status : **Not Answered**
 Chosen Option : --

- Q.6 Two infinite planes each with uniform surface charge density $+\sigma$ are kept in such a way that the angle between them is 30° . The electric field in the region shown between them is given by :



Options

1. $\frac{\sigma}{\epsilon_0} \left[\left(1 + \frac{\sqrt{3}}{2} \right) \hat{y} + \frac{\hat{x}}{2} \right]$
2. $\frac{\sigma}{2\epsilon_0} \left[(1 + \sqrt{3}) \hat{y} + \frac{\hat{x}}{2} \right]$
3. $\frac{\sigma}{2\epsilon_0} \left[(1 + \sqrt{3}) \hat{y} - \frac{\hat{x}}{2} \right]$
4. $\frac{\sigma}{2\epsilon_0} \left[\left(1 - \frac{\sqrt{3}}{2} \right) \hat{y} - \frac{\hat{x}}{2} \right]$

Question Type : **MCQ**

Question ID : **40503610**

Option 1 ID : **40503638**

Option 2 ID : **40503639**

Option 3 ID : **40503640**

Option 4 ID : **40503637**

Status : **Not Answered**

Chosen Option : --

Q.7

Two moles of an ideal gas with $\frac{C_P}{C_V} = \frac{5}{3}$ are mixed with 3 moles of another ideal gas with $\frac{C_P}{C_V} = \frac{4}{3}$. The value of $\frac{C_P}{C_V}$ for the mixture is :

- Options
1. 1.50
 2. 1.45
 3. 1.47
 4. 1.42

Question Type : MCQ

Question ID : 4050367

Option 1 ID : 40503625

Option 2 ID : 40503628

Option 3 ID : 40503626

Option 4 ID : 40503627

Status : Answered

Chosen Option : 3

Q.8

Speed of a transverse wave on a straight wire (mass 6.0 g, length 60 cm and area of cross-section 1.0 mm^2) is 90 ms^{-1} . If the Young's modulus of wire is $16 \times 10^{11} \text{ Nm}^{-2}$, the extension of wire over its natural length is :

- Options
1. 0.03 mm
 2. 0.04 mm
 3. 0.02 mm
 4. 0.01 mm

Question Type : MCQ

Question ID : 4050369

Option 1 ID : 40503633

Option 2 ID : 40503636

Option 3 ID : 40503634

Option 4 ID : 40503635

Status : Not Answered

Chosen Option : --

Q.9 The time period of revolution of electron in its ground state orbit in a hydrogen atom is 1.6×10^{-16} s. The frequency of revolution of the electron in its first excited state (in s^{-1}) is :

- Options
1. 5.6×10^{12}
 2. 1.6×10^{14}
 3. 7.8×10^{14}
 4. 6.2×10^{15}

Question Type : **MCQ**

Question ID : **40503618**

Option 1 ID : **40503672**

Option 2 ID : **40503670**

Option 3 ID : **40503671**

Option 4 ID : **40503669**

Status : **Not Answered**

Chosen Option : --

Q.10 A satellite of mass m is launched vertically upwards with an initial speed u from the surface of the earth. After it reaches height R (R = radius of the earth), it ejects a rocket of mass $\frac{m}{10}$ so that subsequently the satellite moves in a circular orbit. The kinetic energy of the rocket is (G is the gravitational constant; M is the mass of the earth) :

- Options
1. $\frac{3m}{8} \left(u + \sqrt{\frac{5GM}{6R}} \right)^2$
 2. $\frac{m}{20} \left(u^2 + \frac{113}{200} \frac{GM}{R} \right)$
 3. $5m \left(u^2 - \frac{119}{200} \frac{GM}{R} \right)$
 4. $\frac{m}{20} \left(u - \sqrt{\frac{2GM}{3R}} \right)^2$

Question Type : **MCQ**

Question ID : **4050366**

Option 1 ID : **40503623**

Option 2 ID : **40503622**

Option 3 ID : **40503621**

Option 4 ID : **40503624**

Status : **Not Answered**

Chosen Option : --

Q.11 If we need a magnification of 375 from a compound microscope of tube length 150 mm and an objective of focal length 5 mm, the focal length of the eye-piece, should be close to :

- Options
1. 22 mm
 2. 12 mm
 3. 33 mm
 4. 2 mm

Question Type : **MCQ**

Question ID : **40503616**

Option 1 ID : **40503662**

Option 2 ID : **40503661**

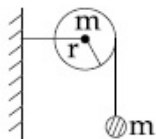
Option 3 ID : **40503663**

Option 4 ID : **40503664**

Status : **Not Answered**

Chosen Option : --

Q.12



As shown in the figure, a bob of mass m is tied by a massless string whose other end portion is wound on a fly wheel (disc) of radius r and mass m . When released from rest the bob starts falling vertically. When it has covered a distance of h , the angular speed of the wheel will be :

Options

1. $r\sqrt{\frac{3}{2gh}}$
2. $r\sqrt{\frac{3}{4gh}}$
3. $\frac{1}{r}\sqrt{\frac{4gh}{3}}$
4. $\frac{1}{r}\sqrt{\frac{2gh}{3}}$

Question Type : **MCQ**

Question ID : **4050362**

Option 1 ID : **4050368**

Option 2 ID : **4050366**

Option 3 ID : **4050365**

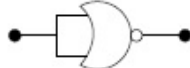
Option 4 ID : **4050367**

Status : **Not Answered**

Chosen Option : --

Q.13 Which of the following gives a reversible operation ?

Options

1. 
2. 
3. 
4. 

Question Type : MCQ

Question ID : 40503619

Option 1 ID : 40503676

Option 2 ID : 40503673

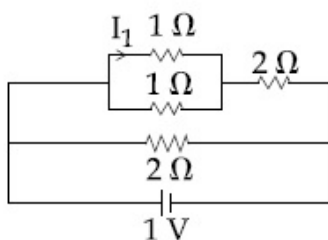
Option 3 ID : 40503675

Option 4 ID : 40503674

Status : Not Answered

Chosen Option : --

Q.14 The current I_1 (in A) flowing through $1\ \Omega$ resistor in the following circuit is :



Options

1. 0.4
2. 0.25
3. 0.2
4. 0.5

Question Type : MCQ

Question ID : 40503612

Option 1 ID : 40503645

Option 2 ID : 40503648

Option 3 ID : 40503647

Option 4 ID : 40503646

Status : Not Answered

Chosen Option : --

Q.15 A LCR circuit behaves like a damped harmonic oscillator. Comparing it with a physical spring-mass damped oscillator having damping constant 'b', the correct equivalence would be :

Options

1. $L \leftrightarrow k, C \leftrightarrow b, R \leftrightarrow m$
2. $L \leftrightarrow m, C \leftrightarrow k, R \leftrightarrow b$
3. $L \leftrightarrow m, C \leftrightarrow \frac{1}{k}, R \leftrightarrow b$
4. $L \leftrightarrow \frac{1}{b}, C \leftrightarrow \frac{1}{m}, R \leftrightarrow \frac{1}{k}$

Question Type : **MCQ**

Question ID : **4050361**

Option 1 ID : **4050363**

Option 2 ID : **4050361**

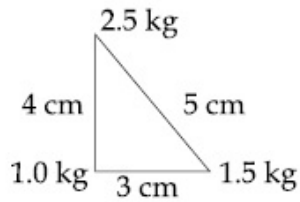
Option 3 ID : **4050362**

Option 4 ID : **4050364**

Status : **Not Answered**

Chosen Option : --

- Q.16 Three point particles of masses 1.0 kg, 1.5 kg and 2.5 kg are placed at three corners of a right angle triangle of sides 4.0 cm, 3.0 cm and 5.0 cm as shown in the figure. The center of mass of the system is at a point :



- Options
1. 2.0 cm right and 0.9 cm above 1 kg mass
 2. 0.9 cm right and 2.0 cm above 1 kg mass
 3. 0.6 cm right and 2.0 cm above 1 kg mass
 4. 1.5 cm right and 1.2 cm above 1 kg mass

Question Type : MCQ

Question ID : 4050364

Option 1 ID : 40503614

Option 2 ID : 40503613

Option 3 ID : 40503615

Option 4 ID : 40503616

Status : Not Answered

Chosen Option : --

Q.17 If the magnetic field in a plane electromagnetic wave is given by

$$\vec{B} = 3 \times 10^{-8} \sin(1.6 \times 10^3 x + 48 \times 10^{10} t) \hat{j} \text{ T},$$
then what will be expression for electric field ?

- Options
1. $\vec{E} = (9 \sin(1.6 \times 10^3 x + 48 \times 10^{10} t) \hat{k} \text{ V/m})$
 2. $\vec{E} = (60 \sin(1.6 \times 10^3 x + 48 \times 10^{10} t) \hat{k} \text{ V/m})$
 3. $\vec{E} = (3 \times 10^{-8} \sin(1.6 \times 10^3 x + 48 \times 10^{10} t) \hat{i} \text{ V/m})$
 4. $\vec{E} = (3 \times 10^{-8} \sin(1.6 \times 10^3 x + 48 \times 10^{10} t) \hat{j} \text{ V/m})$

Question Type : MCQ

Question ID : 40503615

Option 1 ID : 40503658

Option 2 ID : 40503660

Option 3 ID : 40503659

Option 4 ID : 40503657

Status : Not Answered

Chosen Option : --

Q.18 Visible light of wavelength $6000 \times 10^{-8} \text{ cm}$ falls normally on a single slit and produces a diffraction pattern. It is found that the second diffraction minimum is at 60° from the central maximum. If the first minimum is produced at θ_1 , then θ_1 is close to :

- Options
1. 45°
 2. 30°
 3. 25°
 4. 20°

Question Type : MCQ

Question ID : 40503620

Option 1 ID : 40503677

Option 2 ID : 40503678

Option 3 ID : 40503679

Option 4 ID : 40503680

Status : Not Answered

Chosen Option : --

Q.19



A parallel plate capacitor has plates of area A separated by distance ' d ' between them. It is filled with a dielectric which has a dielectric constant that varies as $k(x) = K(1 + \alpha x)$ where ' x ' is the distance measured from one of the plates. If $(\alpha d) \ll 1$, the total capacitance of the system is best given by the expression :

Options

1. $\frac{A\epsilon_0 K}{d} \left(1 + \left(\frac{\alpha d}{2} \right)^2 \right)$
2. $\frac{AK\epsilon_0}{d} \left(1 + \frac{\alpha d}{2} \right)$
3. $\frac{A\epsilon_0 K}{d} \left(1 + \frac{\alpha^2 d^2}{2} \right)$
4. $\frac{AK\epsilon_0}{d} (1 + \alpha d)$

Question Type : MCQ

Question ID : 40503611

Option 1 ID : 40503643

Option 2 ID : 40503644

Option 3 ID : 40503641

Option 4 ID : 40503642

Status : Not Answered

Chosen Option : --

Q.20

A litre of dry air at STP expands adiabatically to a volume of 3 litres. If $\gamma = 1.40$, the work done by air is : $(3^{1.4} = 4.6555)$ [Take air to be an ideal gas]

Options

1. 60.7 J
2. 100.8 J
3. 90.5 J
4. 48 J

Question Type : MCQ

Question ID : 4050368

Option 1 ID : 40503630

Option 2 ID : 40503632

Option 3 ID : 40503631

Option 4 ID : 40503629

Status : Not Answered

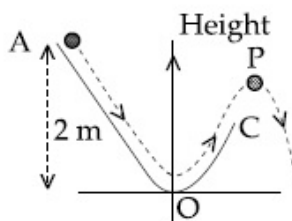
Chosen Option : --

Q.21 A non-isotropic solid metal cube has coefficients of linear expansion as : $5 \times 10^{-5}/^{\circ}\text{C}$ along the x -axis and $5 \times 10^{-6}/^{\circ}\text{C}$ along the y and the z -axis. If the coefficient of volume expansion of the solid is $C \times 10^{-6}/^{\circ}\text{C}$ then the value of C is _____.

Given 25
Answer :

Question Type : SA
Question ID : 40503622
Status : Answered

Q.22 A particle ($m=1$ kg) slides down a frictionless track (AOC) starting from rest at a point A (height 2 m). After reaching C, the particle continues to move freely in air as a projectile. When it reaching its highest point P (height 1 m), the kinetic energy of the particle (in J) is : (Figure drawn is schematic and not to scale; take $g=10 \text{ ms}^{-2}$) _____.



Given 10
Answer :

Question Type : SA
Question ID : 40503621
Status : Answered

Q.23 A Carnot engine operates between two reservoirs of temperatures 900 K and 300 K. The engine performs 1200 J of work per cycle. The heat energy (in J) delivered by the engine to the low temperature reservoir, in a cycle, is _____.

Given 500
Answer :

Question Type : SA
Question ID : 40503623
Status : Answered

Q.24 A beam of electromagnetic radiation of intensity $6.4 \times 10^{-5} \text{ W/cm}^2$ is comprised of wavelength, $\lambda = 310 \text{ nm}$. It falls normally on a metal (work function $\phi = 2\text{eV}$) of surface area of 1 cm^2 . If one in 10^3 photons ejects an electron, total number of electrons ejected in 1 s is 10^x . ($hc = 1240 \text{ eVnm}$, $1\text{eV} = 1.6 \times 10^{-19} \text{ J}$), then x is _____.

Given 4
Answer :

Question Type : **SA**
Question ID : **40503625**
Status : **Answered**

Q.25 A loop ABCDEFA of straight edges has six corner points $A(0, 0, 0)$, $B(5, 0, 0)$, $C(5, 5, 0)$, $D(0, 5, 0)$, $E(0, 5, 5)$ and $F(0, 0, 5)$. The magnetic field in this region is $\vec{B} = (3\hat{i} + 4\hat{k})\text{T}$. The quantity of flux through the loop ABCDEFA (in Wb) is _____.

Given 5
Answer :

Question Type : **SA**
Question ID : **40503624**
Status : **Answered**

Section : Chemistry

Q.1 At 35°C, the vapour pressure of CS₂ is 512 mm Hg and that of acetone is 344 mm Hg. A solution of CS₂ in acetone has a total vapour pressure of 600 mm Hg. The false statement amongst the following is :

- Options
1. heat must be absorbed in order to produce the solution at 35°C
 2. a mixture of 100 mL CS₂ and 100 mL acetone has a volume < 200 mL
 3. CS₂ and acetone are less attracted to each other than to themselves
 4. Raoult's law is not obeyed by this system

Question Type : MCQ

Question ID : 40503626

Option 1 ID : 40503686

Option 2 ID : 40503687

Option 3 ID : 40503688

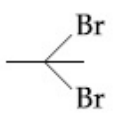
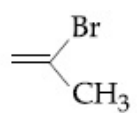
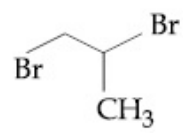
Option 4 ID : 40503689

Status : Not Answered

Chosen Option : --

Q.2 1-methyl ethylene oxide when treated with an excess of HBr produces :

Options

1. 
2. 
3. 
4. 

Question Type : MCQ

Question ID : 40503644

Option 1 ID : 405036161

Option 2 ID : 405036159

Option 3 ID : 405036160

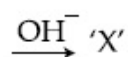
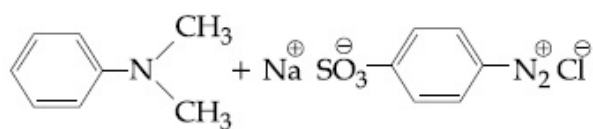
Option 4 ID : 405036158

Status : Not Answered

Chosen Option : --

Q.3

Consider the following reaction :



The product 'X' is used :

Options

1. in protein estimation as an alternative to ninhydrin
2. in laboratory test for phenols
3. as food grade colourant
4. in acid base titration as an indicator

Question Type : MCQ

Question ID : 40503639

Option 1 ID : 405036139

Option 2 ID : 405036141

Option 3 ID : 405036138

Option 4 ID : 405036140

Status : Not Answered

Chosen Option : --

Q.4 A solution of m-chloroaniline, m-chlorophenol and m-chlorobenzoic acid in ethyl acetate was extracted initially with a saturated solution of NaHCO_3 to give fraction A. The left over organic phase was extracted with dilute NaOH solution to give fraction B. The final organic layer was labelled as fraction C. Fractions A, B and C, contain respectively :

- Options
1. m-chlorobenzoic acid, m-chloroaniline and m-chlorophenol
 2. m-chlorobenzoic acid, m-chlorophenol and m-chloroaniline
 3. m-chlorophenol, m-chlorobenzoic acid and m-chloroaniline
 4. m-chloroaniline, m-chlorobenzoic acid and m-chlorophenol

Question Type : **MCQ**

Question ID : **40503641**

Option 1 ID : **405036147**

Option 2 ID : **405036148**

Option 3 ID : **405036149**

Option 4 ID : **405036146**

Status : **Not Answered**

Chosen Option : --

Q.5 The purest form of commercial iron is :

- Options
1. wrought iron
 2. pig iron
 3. scrap iron and pig iron
 4. cast iron

Question Type : **MCQ**

Question ID : **40503633**

Option 1 ID : **405036114**

Option 2 ID : **405036115**

Option 3 ID : **405036117**

Option 4 ID : **405036116**

Status : **Not Answered**

Chosen Option : --

Q.6 Amongst the following statements, that which was not proposed by Dalton was :

- Options
1. all the atoms of a given element have identical properties including identical mass. Atoms of different elements differ in mass.
 2. matter consists of indivisible atoms.
 3. when gases combine or reproduced in a chemical reaction they do so in a simple ratio by volume provided all gases are at the same T & P.
 4. chemical reactions involve reorganization of atoms. These are neither created nor destroyed in a chemical reaction.

Question Type : **MCQ**
Question ID : **40503631**
Option 1 ID : **405036107**
Option 2 ID : **405036106**
Option 3 ID : **405036108**
Option 4 ID : **405036109**
Status : **Not Answered**
Chosen Option : --

Q.7 The atomic radius of Ag is closest to :

- Options
1. Au
 2. Ni
 3. Hg
 4. Cu

Question Type : **MCQ**
Question ID : **40503636**
Option 1 ID : **405036129**
Option 2 ID : **405036126**
Option 3 ID : **405036128**
Option 4 ID : **405036127**
Status : **Not Answered**
Chosen Option : --

Q.8 The IUPAC name of the complex $[\text{Pt}(\text{NH}_3)_2\text{Cl}(\text{NH}_2\text{CH}_3)]\text{Cl}$ is :

- Options**
1. Diammine(methanamine)chlorido platinum(II)chloride
 2. Diamminechlorido(methanamine) platinum(II)chloride
 3. Diamminechlorido(aminomethane) platinum(II)chloride
 4. Bisammine(methanamine)chlorido platinum(II)chloride

Question Type : **MCQ**

Question ID : **40503638**

Option 1 ID : **405036135**

Option 2 ID : **405036136**

Option 3 ID : **405036137**

Option 4 ID : **405036134**

Status : **Not Answered**

Chosen Option : --

Q.9 The theory that can completely/properly explain the nature of bonding in $[\text{Ni}(\text{Co})_4]$ is :

- Options**
1. Molecular orbital theory
 2. Crystal field theory
 3. Werner's theory
 4. Valence bond theory

Question Type : **MCQ**

Question ID : **40503637**

Option 1 ID : **405036133**

Option 2 ID : **405036132**

Option 3 ID : **405036130**

Option 4 ID : **405036131**

Status : **Answered**

Chosen Option : **2**

Q.10 Match the following :

- | | |
|--------------------|-----------------|
| (i) Riboflavin | (a) Beriberi |
| (ii) Thiamine | (b) Scurvy |
| (iii) Pyridoxine | (c) Cheilosis |
| (iv) Ascorbic acid | (d) Convulsions |

Options 1. (i)-(a), (ii)-(d), (iii)-(c), (iv)-(b)

2. (i)-(c), (ii)-(a), (iii)-(d), (iv)-(b)

3. (i)-(c), (ii)-(d), (iii)-(a), (iv)-(b)

4. (i)-(d), (ii)-(b), (iii)-(a), (iv)-(c)

Question Type : **MCQ**

Question ID : **40503642**

Option 1 ID : **405036153**

Option 2 ID : **405036150**

Option 3 ID : **405036152**

Option 4 ID : **405036151**

Status : **Answered**

Chosen Option : **2**

Q.11 The dipole moments of CCl_4 , CHCl_3 and CH_4 are in the order :

Options 1. $\text{CH}_4 = \text{CCl}_4 < \text{CHCl}_3$

2. $\text{CHCl}_3 < \text{CH}_4 = \text{CCl}_4$

3. $\text{CH}_4 < \text{CCl}_4 < \text{CHCl}_3$

4. $\text{CCl}_4 < \text{CH}_4 < \text{CHCl}_3$

Question Type : **MCQ**

Question ID : **40503628**

Option 1 ID : **40503696**

Option 2 ID : **40503697**

Option 3 ID : **40503694**

Option 4 ID : **40503695**

Status : **Not Attempted and
Marked For Review**

Chosen Option : **--**

Q.12 Given that the standard potentials (E°) of Cu^{2+}/Cu and Cu^+/Cu are 0.34 V and 0.522 V respectively, the E° of $\text{Cu}^{2+}/\text{Cu}^+$ is :

- Options**
1. -0.182 V
 2. +0.158 V
 3. -0.158 V
 4. 0.182 V

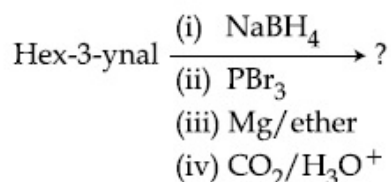
Question Type : **MCQ**
Question ID : **40503627**
Option 1 ID : **40503691**
Option 2 ID : **40503692**
Option 3 ID : **40503693**
Option 4 ID : **40503690**
Status : **Answered**
Chosen Option : **1**

Q.13 The electron gain enthalpy (in kJ/mol) of fluorine, chlorine, bromine and iodine, respectively, are :

- Options**
1. -333, -349, -325 and -296
 2. -349, -333, -325 and -296
 3. -296, -325, -333 and -349
 4. -333, -325, -349 and -296

Question Type : **MCQ**
Question ID : **40503632**
Option 1 ID : **405036110**
Option 2 ID : **405036111**
Option 3 ID : **405036113**
Option 4 ID : **405036112**
Status : **Answered**
Chosen Option : **1**

Q.14 What is the product of following reaction ?



- Options
1.  CCCC#CCCC(=O)O
 2.  CCCC#CCCC(=O)O
 3.  CCCC#CCCC(=O)O
 4.  CCCCCC(=O)O

Question Type : MCQ

Question ID : 40503643

Option 1 ID : 405036156

Option 2 ID : 405036157

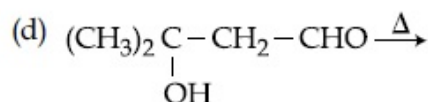
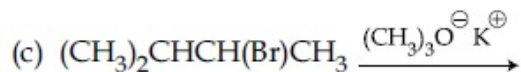
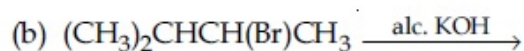
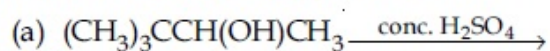
Option 3 ID : 405036154

Option 4 ID : 405036155

Status : Not Answered

Chosen Option : --

Q.15 Consider the following reactions :



Which of these reaction(s) will not produce Saytzeff product ?

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

Question Type : MCQ

Question ID : 40503645

Option 1 ID : 405036165

Option 2 ID : 405036163

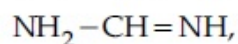
Option 3 ID : 405036164

Option 4 ID : 405036162

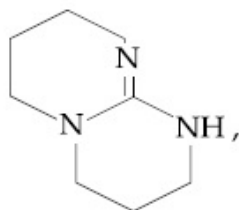
Status : Not Answered

Chosen Option : --

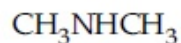
Q.16 The increasing order of pK_b for the following compounds will be :



(A)



(B)



(C)

- Options
1. (B) < (C) < (A)
 2. (C) < (A) < (B)
 3. (A) < (B) < (C)
 4. (B) < (A) < (C)

Question Type : MCQ

Question ID : 40503640

Option 1 ID : 405036143

Option 2 ID : 405036144

Option 3 ID : 405036142

Option 4 ID : 405036145

Status : Answered

Chosen Option : 2

Q.17 The number of orbitals associated with quantum numbers $n=5$, $m_s = +\frac{1}{2}$ is :

- Options
1. 25
 2. 11
 3. 15
 4. 50

Question Type : MCQ

Question ID : 40503629

Option 1 ID : 405036100

Option 2 ID : 405036101

Option 3 ID : 40503699

Option 4 ID : 40503698

Status : Not Answered

Chosen Option : --

Q.18 The relative strength of interionic/ intermolecular forces in decreasing order is :

- Options**
1. ion-dipole > dipole-dipole > ion-ion
 2. ion-ion > ion-dipole > dipole-dipole
 3. ion-dipole > ion-ion > dipole-dipole
 4. dipole-dipole > ion-dipole > ion-ion

Question Type : **MCQ**

Question ID : **40503630**

Option 1 ID : **405036104**

Option 2 ID : **405036103**

Option 3 ID : **405036102**

Option 4 ID : **405036105**

Status : **Answered**

Chosen Option : **2**

Q.19 In comparison to the zeolite process for the removal of permanent hardness, the synthetic resins method is :

- Options**
1. less efficient as the resins cannot be regenerated
 2. less efficient as it exchanges only anions
 3. more efficient as it can exchange only cations
 4. more efficient as it can exchange both cations as well as anions

Question Type : **MCQ**

Question ID : **40503634**

Option 1 ID : **405036121**

Option 2 ID : **405036118**

Option 3 ID : **405036120**

Option 4 ID : **405036119**

Status : **Not Answered**

Chosen Option : **--**

Q.20 Oxidation number of potassium in K_2O , K_2O_2 and KO_2 , respectively, is :

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

Question Type : **MCQ**

Question ID : **40503635**

Option 1 ID : **405036125**

Option 2 ID : **405036124**

Option 3 ID : **405036122**

Option 4 ID : **405036123**

Status : **Answered**

Chosen Option : **3**

Q.21 Two solutions, A and B, each of 100 L was made by dissolving 4 g of NaOH and 9.8 g of H_2SO_4 in water, respectively. The pH of the resultant solution obtained from mixing 40 L of solution A and 10 L of solution B is _____.

Given 5
Answer :

Question Type : **SA**

Question ID : **40503647**

Status : **Answered**

Q.22 The number of chiral carbons in chloramphenicol is _____.

Given 2
Answer :

Question Type : **SA**

Question ID : **40503650**

Status : **Answered**

Q.23 For the reaction ;
 $A(l) \rightarrow 2B(g)$
 $\Delta U = 2.1 \text{ kcal}$, $\Delta S = 20 \text{ cal K}^{-1}$ at 300 K.
Hence ΔG in kcal is _____.

Given 6002.1
Answer :

Question Type : **SA**

Question ID : **40503648**

Status : **Answered**

Q.24 During the nuclear explosion, one of the products is ^{90}Sr with half life of 6.93 years. If $1\text{ }\mu\text{g}$ of ^{90}Sr was absorbed in the bones of a newly born baby in place of Ca, how much time, in years, is required to reduce it by 90% if it is not lost metabolically _____.

Given **9.9**
Answer :

Question Type : **SA**
Question ID : **40503646**
Status : **Answered**

Q.25 Chlorine reacts with hot and concentrated NaOH and produces compounds (X) and (Y). Compound (X) gives white precipitate with silver nitrate solution. The average bond order between Cl and O atoms in (Y) is _____.

Given **3**
Answer :

Question Type : **SA**
Question ID : **40503649**
Status : **Answered**

Section : Mathematics

Q.1 The area of the region, enclosed by the circle $x^2 + y^2 = 2$ which is not common to the region bounded by the parabola $y^2 = x$ and the straight line $y = x$, is :

- Options
1. $\frac{1}{3}(12\pi - 1)$
 2. $\frac{1}{6}(12\pi - 1)$
 3. $\frac{1}{3}(6\pi - 1)$
 4. $\frac{1}{6}(24\pi - 1)$

Question Type : **MCQ**
Question ID : **40503661**
Option 1 ID : **405036214**
Option 2 ID : **405036212**
Option 3 ID : **405036213**
Option 4 ID : **405036211**
Status : **Not Answered**
Chosen Option : --

Q.2 Total number of 6-digit numbers in which only and all the five digits 1, 3, 5, 7 and 9 appear, is :

- Options
1. 5^6
 2. $\frac{1}{2}(6!)$
 3. $6!$
 4. $\frac{5}{2}(6!)$

Question Type : **MCQ**

Question ID : **40503655**

Option 1 ID : **405036190**

Option 2 ID : **405036188**

Option 3 ID : **405036187**

Option 4 ID : **405036189**

Status : **Not Answered**

Chosen Option : --

Q.3 An unbiased coin is tossed 5 times. Suppose that a variable X is assigned the value k when k consecutive heads are obtained for k=3, 4, 5, otherwise X takes the value -1. Then the expected value of X, is :

- Options
1. $\frac{1}{8}$
 2. $\frac{3}{16}$
 3. $-\frac{1}{8}$
 4. $-\frac{3}{16}$

Question Type : **MCQ**

Question ID : **40503668**

Option 1 ID : **405036242**

Option 2 ID : **405036239**

Option 3 ID : **405036241**

Option 4 ID : **405036240**

Status : **Not Answered**

Chosen Option : --

Q.4

If $\operatorname{Re}\left(\frac{z-1}{2z+i}\right) = 1$, where $z = x + iy$, then the point (x, y) lies on a :

Options

1. circle whose centre is at $\left(-\frac{1}{2}, -\frac{3}{2}\right)$.
2. straight line whose slope is $\frac{3}{2}$.
3. circle whose diameter is $\frac{\sqrt{5}}{2}$.
4. straight line whose slope is $-\frac{2}{3}$.

Question Type : MCQ

Question ID : 40503652

Option 1 ID : 405036177

Option 2 ID : 405036176

Option 3 ID : 405036178

Option 4 ID : 405036175

Status : Not Attempted and Marked For Review

Chosen Option : --

Q.5

If $f(a+b+1-x) = f(x)$, for all x , where a and b are fixed positive real numbers, then $\frac{1}{a+b} \int_a^b x(f(x) + f(x+1))dx$ is equal to :

Options

1. $\int_{a-1}^{b-1} f(x)dx$
2. $\int_{a+1}^{b+1} f(x+1)dx$
3. $\int_{a-1}^{b-1} f(x+1)dx$
4. $\int_{a+1}^{b+1} f(x)dx$

Question Type : MCQ

Question ID : 40503660

Option 1 ID : 405036207

Option 2 ID : 405036210

Option 3 ID : 405036208

Option 4 ID : 405036209

Status : Not Answered

Chosen Option : --

Q.6 If the distance between the foci of an ellipse is 6 and the distance between its directrices is 12, then the length of its latus rectum is :

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

Question Type : MCQ

Question ID : 40503664

Option 1 ID : 405036224

Option 2 ID : 405036226

Option 3 ID : 405036223

Option 4 ID : 405036225

Status : Answered

Chosen Option : 4

Q.7 The logical statement $(p \Rightarrow q) \wedge (q \Rightarrow \sim p)$ is equivalent to :

- Options
1. $\sim p$
 2. p
 3. q
 4. $\sim q$

Question Type : MCQ

Question ID : 40503670

Option 1 ID : 405036249

Option 2 ID : 405036247

Option 3 ID : 405036248

Option 4 ID : 405036250

Status : Answered

Chosen Option : 1

Q.8 The greatest positive integer k , for which $49^k + 1$ is a factor of the sum $49^{125} + 49^{124} + \dots + 49^2 + 49 + 1$, is :

Options 1. 32

2. 60

3. 65

4. 63

Question Type : MCQ

Question ID : 40503657

Option 1 ID : 405036195

Option 2 ID : 405036196

Option 3 ID : 405036198

Option 4 ID : 405036197

Status : Not Answered

Chosen Option : --

Q.9 A vector $\vec{a} = \alpha \hat{i} + 2\hat{j} + \beta \hat{k}$ ($\alpha, \beta \in \mathbb{R}$) lies in the plane of the vectors, $\vec{b} = \hat{i} + \hat{j}$ and $\vec{c} = \hat{i} - \hat{j} + 4\hat{k}$. If $\vec{a}$ bisects the angle between $\vec{b}$ and $\vec{c}$, then :

Options 1. $\vec{a} \cdot \hat{i} + 3 = 0$

2. $\vec{a} \cdot \hat{k} + 4 = 0$

3. $\vec{a} \cdot \hat{i} + 1 = 0$

4. $\vec{a} \cdot \hat{k} + 2 = 0$

Question Type : MCQ

Question ID : 40503666

Option 1 ID : 405036233

Option 2 ID : 405036234

Option 3 ID : 405036231

Option 4 ID : 405036232

Status : Not Answered

Chosen Option : --

Q.10 If

$$y(\alpha) = \sqrt{2\left(\frac{\tan\alpha + \cot\alpha}{1 + \tan^2\alpha}\right) + \frac{1}{\sin^2\alpha}}, \alpha \in \left(\frac{3\pi}{4}, \pi\right),$$

then $\frac{dy}{d\alpha}$ at $\alpha = \frac{5\pi}{6}$ is :

Options

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

Question Type : MCQ

Question ID : 40503669

Option 1 ID : 405036244

Option 2 ID : 405036243

Option 3 ID : 405036246

Option 4 ID : 405036245

Status : Not Answered

Chosen Option : --

Q.11 If $y = mx + 4$ is a tangent to both the parabolas, $y^2 = 4x$ and $x^2 = 2by$, then b is equal to :

Options

1. -64
2. 128
3. -128
4. -32

Question Type : MCQ

Question ID : 40503663

Option 1 ID : 405036221

Option 2 ID : 405036220

Option 3 ID : 405036219

Option 4 ID : 405036222

Status : Not Answered

Chosen Option : --

Q.12 Let α be a root of the equation $x^2 + x + 1 = 0$

and the matrix $A = \frac{1}{\sqrt{3}} \begin{bmatrix} 1 & 1 & 1 \\ 1 & \alpha & \alpha^2 \\ 1 & \alpha^2 & \alpha^4 \end{bmatrix},$

then the matrix A^{31} is equal to :

Options 1. A

2. A^2

3. A^3

4. I_3

Question Type : MCQ

Question ID : 40503653

Option 1 ID : 405036179

Option 2 ID : 405036180

Option 3 ID : 405036181

Option 4 ID : 405036182

Status : Not Answered

Chosen Option : --

Q.13 If $g(x) = x^2 + x - 1$ and

$(g \circ f)(x) = 4x^2 - 10x + 5$, then $f\left(\frac{5}{4}\right)$ is equal

to :

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

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

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

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

Question Type : MCQ

Question ID : 40503651

Option 1 ID : 405036173

Option 2 ID : 405036171

Option 3 ID : 405036172

Option 4 ID : 405036174

Status : Answered

Chosen Option : 2

Q.14 Let α and β be two real roots of the equation $(k+1)\tan^2 x - \sqrt{2} \cdot \lambda \tan x = (1-k)$, where $k(\neq -1)$ and λ are real numbers. If $\tan^2(\alpha + \beta) = 50$, then a value of λ is :

- Options**
1. $5\sqrt{2}$
 2. $10\sqrt{2}$
 3. 10
 4. 5

Question Type : **MCQ**
Question ID : **40503667**
Option 1 ID : **405036238**
Option 2 ID : **405036237**
Option 3 ID : **405036236**
Option 4 ID : **405036235**
Status : **Not Answered**
Chosen Option : --

Q.15 Let P be a plane passing through the points $(2, 1, 0)$, $(4, 1, 1)$ and $(5, 0, 1)$ and R be any point $(2, 1, 6)$. Then the image of R in the plane P is :

- Options**
1. $(6, 5, 2)$
 2. $(6, 5, -2)$
 3. $(4, 3, 2)$
 4. $(3, 4, -2)$

Question Type : **MCQ**
Question ID : **40503665**
Option 1 ID : **405036229**
Option 2 ID : **405036227**
Option 3 ID : **405036228**
Option 4 ID : **405036230**
Status : **Not Answered**
Chosen Option : --

Q.16 Let $x^k + y^k = a^k$, ($a, k > 0$) and

$$\frac{dy}{dx} + \left(\frac{y}{x}\right)^{\frac{1}{3}} = 0, \text{ then } k \text{ is :}$$

Options

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

Question Type : **MCQ**

Question ID : **40503658**

Option 1 ID : **405036200**

Option 2 ID : **405036202**

Option 3 ID : **405036199**

Option 4 ID : **405036201**

Status : **Answered**

Chosen Option : **3**

Q.17 Let the function, $f : [-7, 0] \rightarrow \mathbb{R}$ be continuous on $[-7, 0]$ and differentiable on $(-7, 0)$. If $f(-7) = -3$ and $f'(x) \leq 2$, for all $x \in (-7, 0)$, then for all such functions f , $f(-1) + f(0)$ lies in the interval :

Options

1. $[-6, 20]$
2. $(-\infty, 20]$
3. $(-\infty, 11]$
4. $[-3, 11]$

Question Type : **MCQ**

Question ID : **40503659**

Option 1 ID : **405036205**

Option 2 ID : **405036206**

Option 3 ID : **405036203**

Option 4 ID : **405036204**

Status : **Not Answered**

Chosen Option : **--**

Q.18 If $y = y(x)$ is the solution of the differential equation, $e^y \left(\frac{dy}{dx} - 1 \right) = e^x$ such that $y(0) = 0$, then $y(1)$ is equal to :

- Options
1. $\log_e 2$
 2. $2e$
 3. $2 + \log_e 2$
 4. $1 + \log_e 2$

Question Type : MCQ

Question ID : 40503662

Option 1 ID : 405036216

Option 2 ID : 405036218

Option 3 ID : 405036217

Option 4 ID : 405036215

Status : Not Answered

Chosen Option : --

Q.19 Five numbers are in A.P., whose sum is 25 and product is 2520. If one of these five numbers is $-\frac{1}{2}$, then the greatest number amongst them is :

- Options
1. 16
 2. 27
 3. 7
 4. $\frac{21}{2}$

Question Type : MCQ

Question ID : 40503656

Option 1 ID : 405036192

Option 2 ID : 405036194

Option 3 ID : 405036191

Option 4 ID : 405036193

Status : Answered

Chosen Option : 4

Q.20 If the system of linear equations
 $2x + 2ay + az = 0$
 $2x + 3by + bz = 0$
 $2x + 4cy + cz = 0,$
 where $a, b, c \in \mathbb{R}$ are non-zero and distinct;
 has a non-zero solution, then :

- Options
1. $a + b + c = 0$
 2. a, b, c are in A.P.
 3. $\frac{1}{a}, \frac{1}{b}, \frac{1}{c}$ are in A.P.
 4. a, b, c are in G.P.

Question Type : **MCQ**

Question ID : **40503654**

Option 1 ID : **405036183**

Option 2 ID : **405036186**

Option 3 ID : **405036184**

Option 4 ID : **405036185**

Status : **Answered**

Chosen Option : **3**

Q.21 $\lim_{x \rightarrow 2} \frac{3^x + 3^{3-x} - 12}{3^{-x/2} - 3^{1-x}}$ is equal to _____.

Given **36**
 Answer :

Question Type : **SA**

Question ID : **40503673**

Status : **Answered**

Q.22 If the variance of the first n natural numbers is 10 and the variance of the first m even natural numbers is 16, then $m + n$ is equal to _____.

Given **24.8**
 Answer :

Question Type : **SA**

Question ID : **40503671**

Status : **Answered**

Q.23 If the sum of the coefficients of all even powers of x in the product $(1+x+x^2+\dots+x^{2n})(1-x+x^2-x^3+\dots+x^{2n})$ is 61, then n is equal to _____.

Given 15
Answer :

Question Type : SA
Question ID : 40503672
Status : Answered

Q.24 Let S be the set of points where the function, $f(x) = |2 - |x - 3||$, $x \in \mathbb{R}$, is not differentiable. Then $\sum_{x \in S} f(f(x))$ is equal to _____.

Given 2
Answer :

Question Type : SA
Question ID : 40503674
Status : Answered

Q.25 Let $A(1, 0)$, $B(6, 2)$ and $C\left(\frac{3}{2}, 6\right)$ be the vertices of a triangle ABC . If P is a point inside the triangle ABC such that the triangles APC , APB and BPC have equal areas, then the length of the line segment PQ , where Q is the point $\left(-\frac{7}{6}, -\frac{1}{3}\right)$, is _____.

Given 5
Answer :

Question Type : SA
Question ID : 40503675
Status : Answered