National Testing Agency

Question Paper Name:	Paper I EHG 10th April 2019 Shift 1
Subject Name:	Paper I EHG
Creation Date:	2019-04-10 14:12:19
Duration:	180
Total Marks:	360
Display Marks:	Yes

Paper I

Group Number :	1
Group Id :	416529157
Group Maximum Duration :	0
Group Minimum Duration :	180
Revisit allowed for view? :	No
Revisit allowed for edit? :	No
Break time:	0
Group Marks:	360

Physics

Section Id :	416529265
Section Number :	1
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	416529405
Question Shuffling Allowed :	Yes

Question Number : 1 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Given below in the left column are different modes of communication using the kinds of waves given in the right column.

A.	Optical Fibre Communication	P.	Ultrasound
B.	Radar	Q.	Infrared Light
C.	Sonar	R.	Microwaves
D.	Mobile Phones	S.	Radio Waves

From the options given below, find the most appropriate match between entries in the left and the right column.

Options :

1. A - Q, B - S, C - R, D - P

2. A - Q, B - S, C - P, D - R

3. A - S, B - Q, C - R, D - P

4. A - R, B - P, C - S, D - Q

Question Number : 1 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

नीचे बाएँ स्तंभ में विभिन्न संचार विधायें एवं दायें स्तंभ में तरंगों के प्रकार दिये गये हैं ।

A.	आप्टिकल फाइबर संचार	P.	पराध्वनि
B.	रेडार	Q.	अवरक्त प्रकाश
C.	सोनार	R.	सूक्ष्म तरंगे
D.	मोबाइल फोन	S.	रेडियो तरंगे

दिये गये विकल्पों में, दायें तथा बायें स्तम्भ की प्रविष्टियों का सर्वोचित मिलान क्या होगा ?

Options :

1. A - Q, B - S, C - R, D - P

2. A - Q, B - S, C - P, D - R

3. A - S, B - Q, C - R, D - P

4. A - R, B - P, C - S, D - Q

Question Number : 1 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલ જમણીબાજુના સ્તંભ (કોલમ્) માં દર્શાવેલ તરંગોના પ્રકારથી મળતા જુદાજુદા પ્રકારના સંદેશાવ્યવહાર/ સંચાર પદ્ધતિ ડાબીબાજુના સ્તંભમાં દર્શાવેલ છે.

A.	ઓપ્ટિકલ ફાઇબર સંદેશાવ્યવહાર	P.	પરાશ્રાવ્ય ધ્વનિ (Ultrasound)
B.	રડાર	Q.	પારરક્ત પ્રકાશ
C.	સોનાર	R.	સૂક્ષ્મ તરંગો (માઇક્રો વેવ)
D.	મોબાઇલ ફોન	S.	રેડિયો તરંગો

નીચે આપેલા વિકલ્પો પૈકી ડાબીબાજુના મુદ્દાને અને જમણીબાજુની કોલમ (સ્તંભ)ના આનુષાંગિક તરંગ સાથેનું સૌથી યોગ્ય જોડકું જોડો.

Options :

1. A - Q, B - S, C - R, D - P

2. A - Q, B - S, C - P, D - R

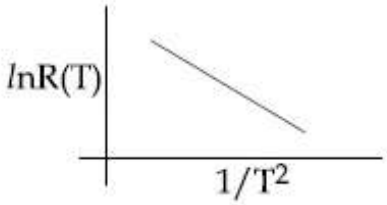
3. A - S, B - Q, C - R, D - P

4. A - R, B - P, C - S, D - Q

Question Number : 2 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In an experiment, the resistance of a material is plotted as a function of temperature (in some range). As shown in the figure, it is a straight line.



One may conclude that :

Options :

1. $R(T)=\frac{R_0}{T^2}$

2. $R(T)=R_0e^{-T^2/T_0^2}$

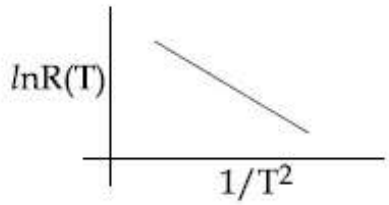
3. $R(T)=R_0e^{-T_0^2/T^2}$

4. $R(T)=R_0e^{T^2/T_0^2}$

Question Number : 2 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक प्रयोग में, एक पदार्थ के प्रतिरोध का तापमान के फलन में (किसी परास में) ग्राफ बनाया जाता है। दिखाये गये चित्रानुसार यह एक सरल रेखा है। इससे निष्कर्ष निकाल सकते है कि :



Options :

1. $R(T)=\frac{R_0}{T^2}$

2. $R(T)=R_0e^{-T^2/T_0^2}$

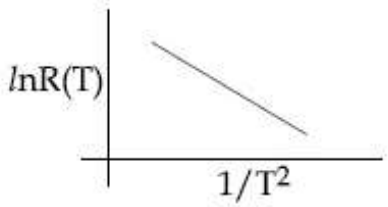
3. $R(T)=R_0e^{-T_0^2/T^2}$

4. $R(T)=R_0e^{T^2/T_0^2}$

Question Number : 2 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એક પ્રયોગમાં, કોઇ પદાર્થ માટે અવરોધ ને (કોઇ ચોક્કસ ગાળા માટે) તાપમાનના વિધેય તરીકે દર્શાવેલ છે. આકૃતિમાં દર્શાવ્યા મુજબ તે એક સુરેખા છે.



આપણે તારણ બાંધી શકીએ કે :

Options :

1. $R(T)=\frac{R_0}{T^2}$

2. $R(T)=R_0e^{-T^2/T_0^2}$

3. $R(T)=R_0e^{-T_0^2/T^2}$

4. $R(T)=R_0e^{T^2/T_0^2}$

Question Number : 3 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A particle of mass m is moving along a trajectory given by

$x=x_0+a\cos\omega_1 t$

$y=y_0+b\sin\omega_2 t$

The torque, acting on the particle about the origin, at $t=0$ is :

Options :

1. $+my_0a\omega_1^2\hat{k}$

2. $m(-x_0b+y_0a)\omega_1^2\hat{k}$

3. $-m(x_0 b\omega_2^2 - y_0 a\omega_1^2)\hat{k}$

4. Zero

Question Number : 3 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान m के एक पिण्ड का पथ निम्न है :

$x = x_0 + a\cos\omega_1 t$

$y = y_0 + b\sin\omega_2 t$

$t = 0$ पर, मूलबिंदु के सापेक्ष पिण्ड पर लगने वाला जड़त्व आघूर्ण होगा :

Options :

1. $+my_0 a\omega_1^2\hat{k}$

2. $m(-x_0 b + y_0 a)\omega_1^2\hat{k}$

3. $-m(x_0 b\omega_2^2 - y_0 a\omega_1^2)\hat{k}$

4. शून्य

Question Number : 3 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એક m દળ ધરાવતો કણ નીચે દર્શાવ્યા મુજબના ગતિપથ ઉપર ગતિ કરે છે.

$x = x_0 + a\cos\omega_1 t$

$y = y_0 + b\sin\omega_2 t$

ઉગમબિંદુનેં અનુરૂપ, $t = 0$ સમયે, કણ ઉપર લાગતું ટોર્ક _____ છે.

Options :

1. $+my_0 a\omega_1^2\hat{k}$

2. $m(-x_0 b + y_0 a)\omega_1^2\hat{k}$

3. $-m(x_0 b\omega_2^2 - y_0 a\omega_1^2)\hat{k}$

4. શૂન્ય

Question Number : 4 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A ball is thrown upward with an initial velocity V_0 from the surface of the earth. The motion of the ball is affected by a drag force equal to $m\gamma v^2$ (where m is mass of the ball, v is its instantaneous velocity and γ is a constant). Time taken by the ball to rise to its zenith is :

Options :

1. $\frac{1}{\sqrt{2\gamma g}}\tan^{-1}\left(\sqrt{\frac{2\gamma}{g}}V_0\right)$

2. $\frac{1}{\sqrt{\gamma g}}\ln\left(1+\sqrt{\frac{\gamma}{g}}V_0\right)$

3. $\frac{1}{\sqrt{\gamma g}}\tan^{-1}\left(\sqrt{\frac{\gamma}{g}}V_0\right)$

4. $\frac{1}{\sqrt{\gamma g}}\sin^{-1}\left(\sqrt{\frac{\gamma}{g}}V_0\right)$

Question Number : 4 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक गेंद को पृथ्वी की सतह से आरम्भिक वेग V_0 से ऊपर की ओर फेंका जाता है। गेंद की गति एक अवरोधक बल $m\gamma v^2$ से प्रभावित होती है। यहाँ m गेंद का द्रव्यमान, v उसका तात्कालिक वेग तथा γ एक स्थिरांक हैं। गेंद द्वारा अपने शीर्षबिंदु तक पहुँचने में लगा समय होगा :

Options :

1. $\frac{1}{\sqrt{2\gamma g}}\tan^{-1}\left(\sqrt{\frac{2\gamma}{g}}V_0\right)$

2. $\frac{1}{\sqrt{\gamma g}}\ln\left(1+\sqrt{\frac{\gamma}{g}}V_0\right)$

3. $\frac{1}{\sqrt{\gamma g}}\tan^{-1}\left(\sqrt{\frac{\gamma}{g}}V_0\right)$

4. $\frac{1}{\sqrt{\gamma g}}\sin^{-1}\left(\sqrt{\frac{\gamma}{g}}V_0\right)$

Question Number : 4 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

પૃથ્વીની સપાટી પરથી એક બોલને V_0 જેટલા પ્રારંભિક વેગથી ઉર્ધ્વદિશામાં ફેંકવામાં આવે છે. આ બોલની ગતિ, મૂલ્યની દષ્ટિએ, $m\gamma v^2$ (જ્યાં, m એ બોલનું દળ અને γ એક અચળાંક) થાય તેવા drag બળ (ઘસાડાવવું) ની અસર અનુભવે છે. બોલને તેના ગતિના zenith (મહત્તમ ઊંચાઇ) સુધી પહોંચતા લાગતો સમય _____ થશે.

Options :

1. $\frac{1}{\sqrt{2\gamma g}}\tan^{-1}\left(\sqrt{\frac{2\gamma}{g}}V_0\right)$

2. $\frac{1}{\sqrt{\gamma g}}\ln\left(1+\sqrt{\frac{\gamma}{g}}V_0\right)$

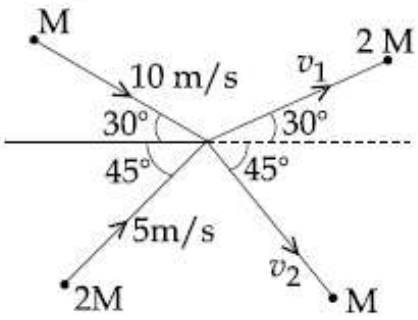
3. $\frac{1}{\sqrt{\gamma g}}\tan^{-1}\left(\sqrt{\frac{\gamma}{g}}V_0\right)$

4. $\frac{1}{\sqrt{\gamma g}}\sin^{-1}\left(\sqrt{\frac{\gamma}{g}}V_0\right)$

Question Number : 5 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Two particles, of masses M and 2M, moving, as shown, with speeds of 10 m/s and 5 m/s, collide elastically at the origin. After the collision, they move along the indicated directions with speeds v_1 and v_2, respectively. The values of v_1 and v_2 are nearly :



Options :

1. 6.5 m/s and 3.2 m/s

2. 3.2 m/s and 12.6 m/s

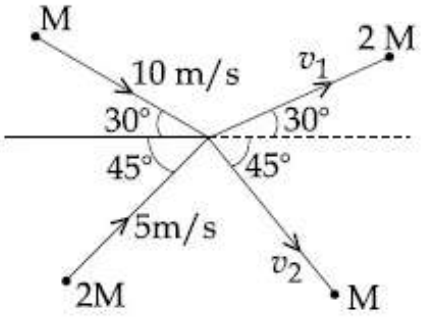
3. 6.5 m/s and 6.3 m/s

4. 3.2 m/s and 6.3 m/s

Question Number : 5 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान M व 2M के दो कण गति 10 m/s तथा 5 m/s, क्रमशः, से चित्रानुसार चलते हुये मूल बिंदु पर प्रत्यास्थ संघट्ट करते है। संघट्ट के बाद वो क्रमशः v_1 तथा v_2 की गति से दिखायी गयी दिशाओं में चलते हैं। v_1 तथा v_2 के निकटतम मान होंगे :



Options :

1. 6.5 m/s तथा 3.2 m/s

2. 3.2 m/s तथा 12.6 m/s

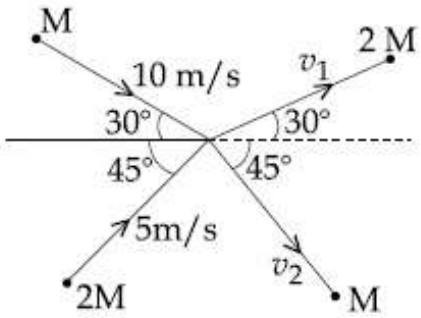
3. 6.5 m/s तथा 6.3 m/s

4. 3.2 m/s तथा 6.3 m/s

Question Number : 5 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

M અને 2 M દળ ધરાવતા બે પદાર્થો, આકૃતિમાં દર્શાવ્યા મુજબ 10 m/s અને 5 m/s ની ઝડપથી ગતિ કરતા-કરતાં, ઉગમબિંદુ આગળ સ્થિતિસ્થાપક સંઘાત (અથડામણ) અનુભવે છે. અથડામણ બાદ, બે બોલ અનુક્રમે v_1 અને v_2 ઝડપથી દર્શાવેલ દિશામાં ગતિ કરે છે. v_1 અને v_2 નું મૂલ્ય _____ (ની નજીકનું) થશે.



Options :

1. 6.5 m/s અને 3.2 m/s

2. 3.2 m/s અને 12.6 m/s

3. 6.5 m/s અને 6.3 m/s

4. 3.2 m/s અને 6.3 m/s

Question Number : 6 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Two coaxial discs, having moments of inertia I_1 and $\frac{I_1}{2}$, are rotating with respective angular velocities ω_1 and $\frac{\omega_1}{2}$, about their common axis. They are brought in contact with each other and thereafter they rotate with a common angular velocity. If E_f and E_i are the final and initial total energies, then $(E_f - E_i)$ is :

Options :

1. $-\frac{I_1\omega_1^2}{12}$

2. $-\frac{I_1\omega_1^2}{24}$

3. $\frac{I_1\omega_1^2}{6}$

4. $\frac{3}{8}I_1\omega_1^2$

Question Number : 6 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

जड़त्व आघूर्ण I_1 तथा $\frac{I_1}{2}$ की दो समअक्षीय डिस्क कोणीय वेग ω_1 तथा $\frac{\omega_1}{2}$, क्रमशः, से अपनी उभयनिष्ठ अक्ष के परितः घूम रहीं हैं। जब दोनों डिस्क को सटा दिया जाता है तो वे बराबर कोणीय वेग से घूमते हैं। यदि E_f तथा E_i अंतिम एवं प्रारम्भिक कुल ऊर्जाएँ हों तो $(E_f - E_i)$ का मान होगा :

Options :

1. $-\frac{I_1\omega_1^2}{12}$

2. $-\frac{I_1\omega_1^2}{24}$

3. $\frac{I_1\omega_1^2}{6}$

4. $\frac{3}{8} I_1\omega_1^2$

Question Number : 6 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

I_1 અને $\frac{I_1}{2}$ જેટલી જડત્વની ચાકમાત્રા ધરાવતી બે સમઅક્ષીય તક્તિઓ તેમની સામાન્ય અક્ષોને અનુલક્ષીને અનુક્રમે ω_1 અને $\frac{\omega_1}{2}$ જેટલા કોણીય વેગોથી ચાકગતિ કરે છે. જ્યારે બે તક્તિઓને સંપર્કમાં લાવવામાં આવે છે ત્યારે તેઓ સામાન્ય કોણીય વેગથી પરિભ્રમણ કરે છે. જો E_f અને E_i અનુક્રમે અંતિમ અને પ્રારંભિક કુલ ઉર્જાઓ હોય તો $(E_f - E_i)$ થશે :

Options :

1. $-\frac{I_1\omega_1^2}{12}$

2. $-\frac{I_1\omega_1^2}{24}$

3. $\frac{I_1\omega_1^2}{6}$

4. $\frac{3}{8} I_1\omega_1^2$

Question Number : 7 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A thin disc of mass M and radius R has mass per unit area $\sigma(r) = kr^2$ where r is the distance from its centre. Its moment of inertia about an axis going through its centre of mass and perpendicular to its plane is :

Options :

1. $\frac{MR^2}{6}$

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

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

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

Question Number : 7 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान M तथा त्रिज्या R की एक पतली डिस्क का प्रति इकाई क्षेत्रफल द्रव्यमान $\sigma(r) = kr^2$ है जहाँ r केन्द्र से दूरी है। डिस्क के केन्द्र से जाने वाली तथा इसके लम्बवत् अक्ष के परित: जड़त्व आघूर्ण होगा :

Options :

1. $\frac{MR^2}{6}$

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

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

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

Question Number : 7 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

M દળ અને R ત્રિજ્યા ધરાવતી એક તકતિનું એકમ ક્ષેત્રફળ દીઠ દળ $\sigma(r) = kr^2$ છે, જ્યાં r એ તેના કેન્દ્રથી અંતર છે. તેના દ્રવ્યમાન કેન્દ્રમાંથી પસાર થતી અને તેના સમતલને લંબ અક્ષને સાપેક્ષે તેની જડત્વની ચાકમાત્રા _____ છે.

Options :

1. $\frac{MR^2}{6}$

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

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

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

Question Number : 8 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The value of acceleration due to gravity at Earth's surface is 9.8 ms^{-2}. The altitude above its surface at which the acceleration due to gravity decreases to 4.9 ms^{-2}, is close to : (Radius of earth $= 6.4 \times 10^6$ m)

Options :

1. 2.6×10^6 m

2. 6.4×10^6 m

3. 1.6×10^6 m

4. 9.0×10^6 m

Question Number : 8 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

पृथ्वी की सतह पर गुरुत्वीय त्वरण का मान 9.8 ms^{-2} है। पृथ्वी की सतह से वह ऊँचाई, जहाँ गुरुत्वीय त्वरण घटकर 4.9 ms^{-2} हो जाती है, होगी : (पृथ्वी की त्रिज्या $= 6.4 \times 10^6$ m)

Options :

1. 2.6×10^6 m

2. 6.4×10^6 m

3. 1.6×10^6 m

4. 9.0×10^6 m

Question Number : 8 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

પૃથ્વીની સપાટી ઉપર ગુરુત્વીયપ્રવેગનું મૂલ્ય $9.8\ ms^{-2}$ અને તેની ત્રિજ્યા 6.4×10^6 m છે. તેની સપાટીથી _____ ઊંચાઇએ કે જ્યાં ગુરુત્વપ્રવેગનું મૂલ્ય ઘટીને $4.9\ ms^{-2}$ થશે.

Options :

1. 2.6×10^6 m

2. 6.4×10^6 m

3. 1.6×10^6 m

4. 9.0×10^6 m

Question Number : 9 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The ratio of surface tensions of mercury and water is given to be 7.5 while the ratio of their densities is 13.6. Their contact angles, with glass, are close to 135° and 0°, respectively. It is observed that mercury gets depressed by an amount *h* in a capillary tube of radius r_1, while water rises by the same amount *h* in a capillary tube of radius r_2. The ratio, (r_1/r_2), is then close to :

Options :

1. 2/5

2. 4/5

3. 2/3

4. 3/5

Question Number : 9 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

पारा तथा पानी के पृष्ठ तनाव का अनुपात 7.5 है जबकि उनके घनत्व का अनुपात 13.6 है। उनके काँच के साथ संपर्क कोण के लगभग मान, क्रमशः, 135° तथा 0° हैं। यह पाया जाता है कि पारा एक त्रिज्या r_1 की केशिका नली में ऊँचाई h से अवनत होता है जबकि पानी त्रिज्या r_2 की केशिका नली में उसी ऊँचाई h से उन्नत होता है। अनुपात r_1/r_2 का निकट मान होगा :

Options :

1. 2/5

2. 4/5

3. 2/3

4. 3/5

Question Number : 9 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

પારા અને પાણી માટે પૃષ્ઠતાણોનો ગુણોત્તર 7.5 છે જ્યારે તેમની ઘનતાનો ગુણોત્તર 13.6 છે. તેમનો કાચ સાથેનો સંપર્ક કોણ અનુક્રમે 135° અને 0° ની નજીકનો છે. એવું જોવા મળે છે કે પારો r_1 ત્રિજ્યા ધરાવતી કેશનળીમાં h જેટલો અવનમિત (નીચે ઉતરે છે) થાયે જ્યારે પાણી r_2 ત્રિજ્યા ધરાવતી કેશનળીમાં h જેટલું ઊંચુ ચડે છે. ગુણોત્તર, (r_1/r_2), નું મૂલ્ય _____ ની નજીકનું હશે.

Options :

1. 2/5

2. 4/5

3. 2/3

4. 3/5

Question Number : 10 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

n moles of an ideal gas with constant volume heat capacity C_V undergo an isobaric expansion by certain volume. The ratio of the work done in the process, to the heat supplied is :

Options :

1. $\frac{4nR}{C_V - nR}$

2. $\frac{nR}{C_V - nR}$

3. $\frac{4nR}{C_V + nR}$

4. $\frac{nR}{C_V + nR}$

Question Number : 10 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक नियत आयतन ऊष्मा धारिता C_V की आदर्श गैस के n मोल का समदाबीय प्रसार किसी आयतन से होता है। प्रक्रिया में किये गये कार्य का दी गई ऊष्मा से अनुपात है :

Options :

1. $\frac{4nR}{C_V - nR}$

2. $\frac{nR}{C_V - nR}$

3. $\frac{4nR}{C_V + nR}$

4. $\frac{nR}{C_V + nR}$

Question Number : 10 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

n મોલ અને C_V જેટલી અચળ કદ ઊષ્માધારિતા ધરાવતો આદર્શ વાયુ યોક્કસ કદ થી સમદાબીય પ્રસરણ અનુભવે છે. આ પક્રિયામાં થતા કાર્ય અને આપાત (આપેલી) ઊષ્માણો ગુણોત્તર _____ થશે.

Options :

1. $\frac{4nR}{C_V - nR}$

2. $\frac{nR}{C_V - nR}$

3. $\frac{4nR}{C_V + nR}$

4. $\frac{nR}{C_V + nR}$

Question Number : 11 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A 25×10^{-3} m^3 volume cylinder is filled with 1 mol of O_2 gas at room temperature (300 K). The molecular diameter of O_2, and its root mean square speed, are found to be 0.3 nm and 200 m/s, respectively. What is the average collision rate (per second) for an O_2 molecule ?

Options :

1. $\sim 10^{12}$

2. $\sim 10^{11}$

3. $\sim 10^{10}$

4. $\sim 10^{13}$

Question Number : 11 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक $25 \times 10^{-3}\ m^3$ आयतन के सिलेंडर में 1 mol O_2 गैस कक्षीय तापमान (300 K) पर भरी है। O_2 के आण्विक व्यास तथा वर्ग माध्य मूल वेग के मान क्रमश: 0.3 nm तथा 200 m/s पाये जाते हैं। किसी O_2 अणु के संघट्ट दर का मान (प्रति सेकण्ड) क्या होगा?

Options :

1. $\sim 10^{12}$

2. $\sim 10^{11}$

3. $\sim 10^{10}$

4. $\sim 10^{13}$

Question Number : 11 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એક $25 \times 10^{-3} m^3$ વાળો નળાકાર ઓરડાના તાપમાને (300 K) 1 mol O_2 વાયુથી ભરેલો છે. O_2 અણુનો વ્યાસ અને સરેરાશ ઝડપ નું મૂલ્ય અનુક્રમે 0.3 nm અને 200 m/s જેટલું નોંધાય છે. કોઇ ચોક્કસ O_2 અણુ માટેનો સરેરાશ સંઘાતનો (પ્રતિ સેકન્ડ) દર કેટલો હશે?

Options :

1. $\sim 10^{12}$

2. $\sim 10^{11}$

3. $\sim 10^{10}$

4. $\sim 10^{13}$

Question Number : 12 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The displacement of a damped harmonic oscillator is given by

$x(t) = e^{-0.1t} \cos(10\pi t + \varphi)$. Here t is in seconds.

The time taken for its amplitude of vibration to drop to half of its initial value is close to :

Options :

1. 4 s

2. 27 s

3. 7 s

4. 13 s

Question Number : 12 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक अवमन्दित आवर्ती दोलक का विस्थापन निम्न है,

$x(t) = e^{-0.1t}\cos(10\pi t + \varphi)$. यहाँ t सेकण्ड में है।

इसके दोलन आयाम को अपने आरम्भिक मान से आधा होने में लगे समय का सन्निकट मान होगा :

Options :

1. 4 s

2. 27 s

3. 7 s

4. 13 s

Question Number : 12 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

અવમંદિત દોલકનું સ્થાનાંતર નીચે મુજબ આપી શકાય છે

$x(t) = e^{-0.1t}\cos(10\pi t + \varphi)$. અહીં, t સેકન્ડમાં છે.

તેના કંપવિસ્તારનું મૂલ્ય તેના પ્રારંભિક મૂલ્ય કરતા અડધું થાય તે માટે લાગતો સમય _____ ની નજીકનો હશે.

Options :

1. 4 s

2. 27 s

3. 7 s

4. 13 s

Question Number : 13 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A stationary source emits sound waves of frequency 500 Hz. Two observers moving along a line passing through the source detect sound to be of frequencies 480 Hz and 530 Hz. Their respective speeds are, in ms^{-1},

(Given speed of sound = 300 m/s)

Options :

1. 12, 18

2. 16, 14

3. 8, 18

4. 12, 16

Question Number : 13 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक स्थिर स्रोत 500 Hz आवृत्ति से ध्वनि उत्सर्जित करता है। दो श्रोता एक ही रेखा, जो कि स्रोत से होकर जाती है, में चलते हैं तो उन्हें ध्वनि की आवृत्ति 480 Hz और 530 Hz सुनाई देती है। इन श्रोताओं की चाल क्रमश: ms^{-1} में होगी :

(दिया है : ध्वनि की चाल = 300 m/s)

Options :

1. 12, 18

2. 16, 14

3. 8, 18

4. 12, 16

Question Number : 13 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એક ઊદ્ગમ 500 Hz ની પ્રાકૃતિક આવૃત્તિ ધરાવતો ધ્વનિ ઉત્પન કરે છે. બે અવલોકનકારો ઉદ્ગમને જોડતી એક જ રેખામાં ગતિ કરે છે અને 480 Hz અને 530 Hz આવૃત્તિ ધરાવતો ધ્વનિ નોંધે છે. અવલોકનકારોની સાપેક્ષ ગતિ _____ થશે.
(ધ્વનિની ઝડપ $300 ms^{-1}$ છે)

Options :

1. 12, 18

2. 16, 14

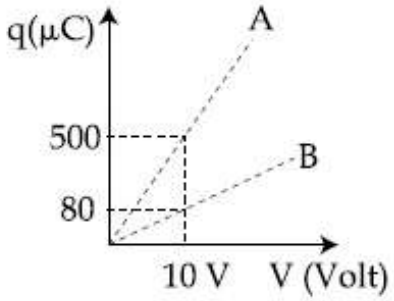
3. 8, 18

4. 12, 16

Question Number : 14 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Figure shows charge (q) versus voltage (V) graph for series and parallel combination of two given capacitors. The capacitances are :



Options :

1. 50 μF and 30 μF

2. 20 μF and 30 μF

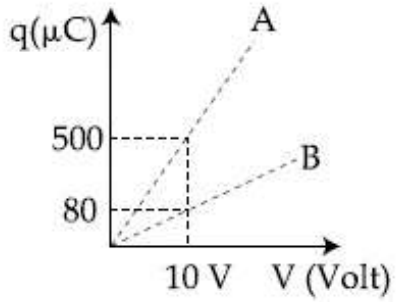
3. 40 μF and 10 μF

4. 60 μF and 40 μF

Question Number : 14 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दो दिये गये संधारित्रों को श्रेणी तथा समान्तर क्रम में लगाने पर उनका आवेश (q) तथा वोल्ट (V) के बीच का संबंध ग्राफ चित्र में दर्शाया गया है। इनकी धारिताओं के मान होंगे :



Options :

1. 50 μF तथा 30 μF

2. 20 μF तथा 30 μF

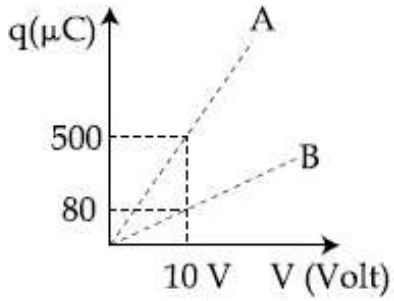
3. 40 μF तथा 10 μF

4. 60 μF तथा 40 μF

Question Number : 14 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

આકૃતિ, શ્રેણીમાં અને સમાંતરમાં જોડેલા આપેલા કેપેસીટરો (સંધારકો) માટે (q) વિરૂદ્ધ (V) ના આલેખો દર્શાવે છે. સંધારકોની સંધારકતા (કેપેસીટન્સ) _____.



Options :

1. 50 μF અને 30 μF

2. 20 μF અને 30 μF

3. 40 μF અને 10 μF

4. 60 μF અને 40 μF

Question Number : 15 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A cylinder with fixed capacity of 67.2 lit contains helium gas at STP. The amount of heat needed to raise the temperature of the gas by 20°C is : [Given that $R = 8.31\ J\ mol^{-1}\ K^{-1}$]

Options :

1. 700 J

2. 748 J

3. 374 J

4. 350 J

Question Number : 15 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक नियत आयतन 67.2 ली. के सिलेंडर में मानक तापमान एवं दबाव (STP) पर हीलियम गैस भरी है। गैस का तापमान 20°C से बढ़ाने के लिए आवश्यक ऊष्मा होगी :

[दिया है : $R = 8.31\ J\ mol^{-1}\ K^{-1}$]

Options :

1. 700 J

2. 748 J

3. 374 J

4. 350 J

Question Number : 15 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એક 67.2 lit જેટલું અચળ કદ ધરાવતા નળાકારમાં STP એ હીલીયમ વાયુ ભરેલો છે. 20°C જેટલું તાપમાન વધારવા માટે જરૂરી ઊષ્માનો જથ્થો _____ છે [$R = 8.31\ J\ mol^{-1}\ K^{-1}$ આપેલ છે.]

Options :

1. 700 J

2. 748 J

3. 374 J

4. 350 J

Question Number : 16 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A uniformly charged ring of radius 3a and total charge q is placed in *xy*-plane centred at origin. A point charge q is moving towards the ring along the *z*-axis and has speed v at $z = 4a$. The minimum value of v such that it crosses the origin is :

Options :

1. $\sqrt{\frac{2}{m}}\left(\frac{1}{15}\frac{q^2}{4\pi\epsilon_0 a}\right)^{1/2}$

2. $\sqrt{\frac{2}{m}}\left(\frac{2}{15}\frac{q^2}{4\pi\epsilon_0 a}\right)^{1/2}$

3. $\sqrt{\frac{2}{m}}\left(\frac{1}{5}\frac{q^2}{4\pi\epsilon_0 a}\right)^{1/2}$

4. $\sqrt{\frac{2}{m}}\left(\frac{4}{15}\frac{q^2}{4\pi\epsilon_0 a}\right)^{1/2}$

Question Number : 16 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

कुल आवेश q तथा त्रिज्या 3a का एक एकसमान आवेशित वलय xy-समतल में मूलबिंदु पर केन्द्रित रखा है। एक बिन्दु आवेश q इस वलय की तरफ z-अक्ष पर चल रहा है। इसकी $z=4a$ पर चाल v है। मूलबिंदु को पार करने के लिए v का न्यूनतम मान होगा :

Options :

1. $\sqrt{\frac{2}{m}}\left(\frac{1}{15}\frac{q^2}{4\pi\epsilon_0 a}\right)^{1/2}$

2. $\sqrt{\frac{2}{m}}\left(\frac{2}{15}\frac{q^2}{4\pi\epsilon_0 a}\right)^{1/2}$

3. $\sqrt{\frac{2}{m}}\left(\frac{1}{5}\frac{q^2}{4\pi\epsilon_0 a}\right)^{1/2}$

4. $\sqrt{\frac{2}{m}}\left(\frac{4}{15}\frac{q^2}{4\pi\epsilon_0 a}\right)^{1/2}$

Question Number : 16 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એકસમાન રીતે વિદ્યુતભારીત અને 3a જેટલી ત્રિજ્યા ધરાવતી રીંગ પરનો કુલ વિદ્યુતભાર q છે જેને ઉગમબિંદુ આગળ xy-સમતલમાં મૂકવામાં આવે છે. એક બિંદુવત્ત વિદ્યુતભાર q એ રીંગ તરફ z અક્ષની દિશામાં v ઝડપથી $z=4a$ થી ગતિ કરે છે. બિંદુવત્ત વિદ્યુતભારને રીંગને ઓળંગવવા (ક્રોસ કરવા) આપેલ ઓછામાં ઓછો જરૂરી v _____ છે.

Options :

1. $\sqrt{\frac{2}{m}}\left(\frac{1}{15}\frac{q^2}{4\pi\epsilon_0 a}\right)^{1/2}$

2. $\sqrt{\frac{2}{m}}\left(\frac{2}{15}\frac{q^2}{4\pi\epsilon_0 a}\right)^{1/2}$

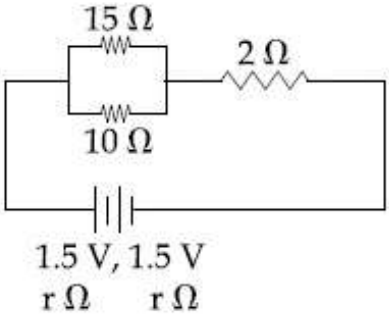
3. $\sqrt{\frac{2}{m}}\left(\frac{1}{5}\frac{q^2}{4\pi\epsilon_0 a}\right)^{1/2}$

4. $\sqrt{\frac{2}{m}}\left(\frac{4}{15}\frac{q^2}{4\pi\epsilon_0 a}\right)^{1/2}$

Question Number : 17 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In the given circuit, an ideal voltmeter connected across the 10 Ω resistance reads 2 V. The internal resistance r, of each cell is :



Options :

1. 1 Ω

2. 1.5 Ω

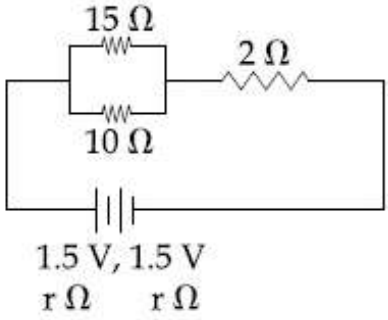
3. 0.5 Ω

4. 0 Ω

Question Number : 17 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दिये गये परिपथ में, एक आदर्श वोल्टमीटर को जब 10 Ω प्रतिरोध के सिरों पर लगाते हैं तो वह 2 V मापता है। प्रत्येक सेल का आंतरिक प्रतिरोध r होगा :



Options :

1. 1 Ω

2. 1.5 Ω

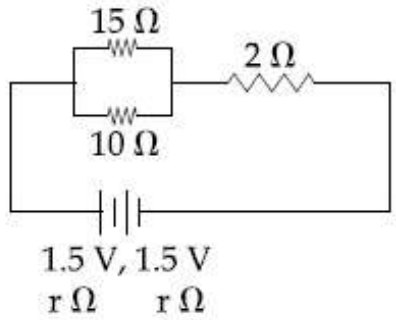
3. 0.5 Ω

4. 0 Ω

Question Number : 17 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

આપેલ પરિપથમાં, એક આદર્શ વોલ્ટમીટર કે જે 10 Ω ના અવરોધને સમાંતર જોડેલ છે તે 2 V અવલોકન નોંધે છે. દરેક વિદ્યુતકોષ (cell) નો આંતરિક અવરોધ r _____.



Options :

1. 1 Ω

2. 1.5 Ω

3. 0.5 Ω

4. $0\,\Omega$

Question Number : 18 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A current of 5 A passes through a copper conductor (resistivity $= 1.7 \times 10^{-8}\ \Omega$m) of radius of cross-section 5 mm. Find the mobility of the charges if their drift velocity is 1.1×10^{-3} m/s.

Options :

1. $1.5\ \text{m}^2/\text{Vs}$

2. $1.8\ \text{m}^2/\text{Vs}$

3. $1.0\ \text{m}^2/\text{Vs}$

4. $1.3\ \text{m}^2/\text{Vs}$

Question Number : 18 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अनुप्रस्थ काट की त्रिज्या 5 mm वाले ताँबे (प्रतिरोधकता $= 1.7 \times 10^{-8}\ \Omega$m) के एक चालक से 5 A की धारा प्रवाहित होती है। यदि आवेशों का अपवाह वेग 1.1×10^{-3} m/s है तो उनकी गतिशीलता होगी :

Options :

1. $1.5\ \text{m}^2/\text{Vs}$

2. $1.8\ \text{m}^2/\text{Vs}$

3. $1.0\ \text{m}^2/\text{Vs}$

4. $1.3\ \text{m}^2/\text{Vs}$

Question Number : 18 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

5 mm ત્રિજ્યા ધરાવતા કોપર વાહક (અવરોધકતા $= 1.7 \times 10^{-8}\ \Omega m$) માંથી 5 A પ્રવાહ પસાર થાય છે. જો તેમનો ડ્રિફ્ટ વેગ 1.1×10^{-3} m/s હોય તો વિદ્યુતભારોની મોબીલીટી શોધો.

Options :

1. $1.5\ m^2/Vs$

2. $1.8\ m^2/Vs$

3. $1.0\ m^2/Vs$

4. $1.3\ m^2/Vs$

Question Number : 19 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A proton, an electron, and a Helium nucleus, have the same energy. They are in circular orbits in a plane due to magnetic field perpendicular to the plane. Let r_p, r_e and r_{He} be their respective radii, then,

Options :

1. $r_e < r_p < r_{He}$

2. $r_e > r_p > r_{He}$

3. $r_e > r_p = r_{He}$

4. $r_e < r_p = r_{He}$

Question Number : 19 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक प्रोटॉन, एक इलैक्ट्रॉन और एक हीलियम नाभिक, की ऊर्जाएँ बराबर हैं। वे एक समतल में उसके लम्बवत् चुम्बकीय क्षेत्र के कारण वृत्ताकार कक्षा में गतिशील हैं। यदि r_p, r_e और r_{He} प्रोटॉन, इलैक्ट्रॉन तथा हीलियम नाभिक के वृत्ताकार पथ की त्रिज्याएँ हैं, तो :

Options :

1. $r_e < r_p < r_{He}$

2. $r_e > r_p > r_{He}$

3. $r_e > r_p = r_{He}$

4. $r_e < r_p = r_{He}$

Question Number : 19 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

સમાન ઉર્જા ધરાવતા એક પ્રોટોન, એક ઇલેક્ટ્રોન અને એક હાઇડ્રોજન આયન ચુંબકીય ક્ષેત્રમાં દાખલ થાય છે. જો પ્રોટોન, ઇલેક્ટ્રોન અને હાઇડ્રોજન આયનના વર્તુળાકાર પથોની ત્રિજ્યાઓ r_p, r_e અને r_{He} હોય તો _____

Options :

1. $r_e < r_p < r_{He}$

2. $r_e > r_p > r_{He}$

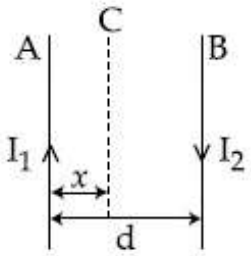
3. $r_e > r_p = r_{He}$

4. $r_e < r_p = r_{He}$

Question Number : 20 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Two wires A & B are carrying currents I_1 & I_2 as shown in the figure. The separation between them is d. A third wire C carrying a current I is to be kept parallel to them at a distance x from A such that the net force acting on it is zero. The possible values of x are :



Options :

1. $x = \pm \frac{I_1 d}{(I_1 - I_2)}$

2. $x = \left(\frac{I_1}{I_1 + I_2}\right) d$ and $x = \frac{I_2}{(I_1 - I_2)} d$

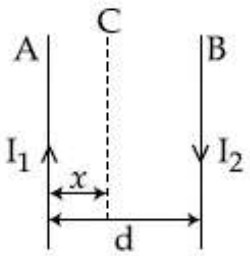
3. $x = \left(\frac{I_1}{I_1 - I_2}\right) d$ and $x = \frac{I_2}{(I_1 + I_2)} d$

4. $x = \left(\frac{I_2}{I_1 + I_2}\right) d$ and $x = \left(\frac{I_2}{I_1 - I_2}\right) d$

Question Number : 20 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दिखाये गये चित्र में दो तार A तथा B में प्रवाहित धारायें I_1 तथा I_2 हैं। उनके बीच की दूरी d है। I धारा वाला एक तीसरे तार C को इनके समान्तर A से x दूरी पर इस प्रकार रखते हैं कि इस पर कुल बल शून्य है। x के सम्भव मान होंगे :



Options :

1. $x = \pm \frac{I_1 d}{(I_1 - I_2)}$

2. $x = \left(\frac{I_1}{I_1 + I_2}\right) d$ तथा $x = \frac{I_2}{(I_1 - I_2)} d$

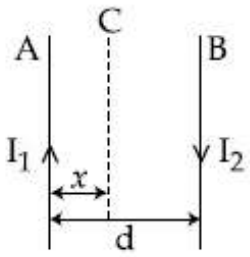
3. $x = \left(\frac{I_1}{I_1 - I_2}\right) d$ तथा $x = \frac{I_2}{(I_1 + I_2)} d$

4. $x = \left(\frac{I_2}{I_1 + I_2}\right) d$ तथा $x = \left(\frac{I_2}{I_1 - I_2}\right) d$

Question Number : 20 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

આકૃતિમાં દર્શાવ્યા મુજબ બે તારો A અને B માંથી I_1 અને I_2 જેટલો વિદ્યુતપ્રવાહ વહે છે. તેઓની વચ્ચેનું અંતર d છે. તેઓને સમાંતર કોઇક એક ત્રીજો I પ્રવાહ ધરાવતા તાર C ને A થી x અંતરે એવી રીતે શખવામાં આવે છે કે જેથી તેના પર લાગતું સમાસ બલ શૂન્ય થાય. x ની શક્ય કિંમતો છે :



Options :

1. $x=\pm\frac{I_1 d}{(I_1-I_2)}$

2. $x=\left(\frac{I_1}{I_1+I_2}\right)d$ અને $x=\frac{I_2}{(I_1-I_2)}d$

3. $x=\left(\frac{I_1}{I_1-I_2}\right)d$ અને $x=\frac{I_2}{(I_1+I_2)}d$

4. $x=\left(\frac{I_2}{I_1+I_2}\right)d$ અને $x=\left(\frac{I_2}{I_1-I_2}\right)d$

Question Number : 21 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A transformer consisting of 300 turns in the primary and 150 turns in the secondary gives output power of 2.2 kW. If the current in the secondary coil is 10 A, then the input voltage and current in the primary coil are :

Options :

1. 440 V and 20 A

2. 220 V and 10 A

3. 440 V and 5 A

4. 220 V and 20 A

Question Number : 21 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

300 फेरों वाली प्राथमिक कुण्डली तथा 150 फेरों वाली द्वितीयक कुण्डली वाले एक ट्रांसफार्मर की निर्गत शक्ति 2.2 kW है। यदि द्वितीयक कुण्डली में धारा का मान 10 A है तो निवेशी वोल्टेज और प्राथमिक कुण्डली में धारा के मान हैं :

Options :

1. 440 V तथा 20 A

2. 220 V तथा 10 A

3. 440 V तथा 5 A

4. 220 V तथा 20 A

Question Number : 21 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એક ટ્રાન્સફોર્મર પ્રાયમરીમાં 300 આંટા અને 150 આંટા સેકન્ડરીમાં ધરાવે છે. જેનો આઉટપુટ પાવર 2.2 kW બતાવે છે. જો સેકન્ડરી ગુંચળામાંથી પસાર થતો પ્રવાહ 10 A હોય તો પ્રાયમરી ગુંચળામાં પસાર થતો ઇનપુટ વોલ્ટેજ અને પ્રવાહ _____ છે.

Options :

1. 440 V અને 20 A

2. 220 V અને 10 A

3. 440 V અને 5 A

4. 220 V અને 20 A

Question Number : 22 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The electric field of a plane electromagnetic wave is given by

$$\vec{E} = E_0 \hat{i} \cos(kz) \cos(\omega t)$$

The corresponding magnetic field $\vec{B}$ is then given by :

Options :

1. $\vec{B} = \frac{E_0}{C} \hat{j} \sin(kz) \sin(\omega t)$

2. $\vec{B} = \frac{E_0}{C} \hat{j} \sin(kz) \cos(\omega t)$

3. $\vec{B} = \frac{E_0}{C} \hat{j} \cos(kz) \sin(\omega t)$

4. $\vec{B} = \frac{E_0}{C} \hat{k} \sin(kz) \cos(\omega t)$

Question Number : 22 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक समतल विद्युत-चुम्बकीय तरंग का विद्युत क्षेत्र निम्न है,

$$\vec{E} = E_0 \hat{i} \cos(kz) \cos(\omega t)$$

तब संगत चुम्बकीय क्षेत्र $\vec{B}$ होगा :

Options :

1. $\vec{B} = \frac{E_0}{C} \hat{j} \sin(kz) \sin(\omega t)$

2. $\vec{B} = \frac{E_0}{C} \hat{j} \sin(kz) \cos(\omega t)$

3. $\vec{B} = \frac{E_0}{C} \hat{j} \cos(kz) \sin(\omega t)$

4. $\vec{B} = \frac{E_0}{C} \hat{k} \sin(kz) \cos(\omega t)$

Question Number : 22 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એક સમતલ વિદ્યુતચુંબકીય તરંગનું વિદ્યુત ક્ષેત્ર નીચે મુજબ આપી શકાય છે.

$$\vec{E} = E_0 \hat{i} \cos(kz) \cos(\omega t)$$

તો ચુંબકીય ક્ષેત્ર $\vec{B}$ હશે :

Options :

1. $\vec{B} = \frac{E_0}{C} \hat{j} \sin(kz) \sin(\omega t)$

2. $\vec{B} = \frac{E_0}{C} \hat{j} \sin(kz) \cos(\omega t)$

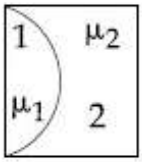
3. $\vec{B} = \frac{E_0}{C} \hat{j} \cos(kz) \sin(\omega t)$

4. $\vec{B} = \frac{E_0}{C} \hat{k} \sin(kz) \cos(\omega t)$

Question Number : 23 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

One plano-convex and one plano-concave lens of same radius of curvature 'R' but of different materials are joined side by side as shown in the figure. If the refractive index of the material of 1 is μ_1 and that of 2 is μ_2, then the focal length of the combination is :



Options :

1. $\frac{R}{\mu_1 - \mu_2}$

2. $\frac{2R}{\mu_1 - \mu_2}$

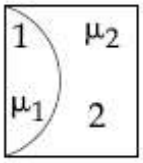
3. $\frac{R}{2(\mu_1 - \mu_2)}$

4. $\frac{R}{2-(\mu_1 - \mu_2)}$

Question Number : 23 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक समतल-उत्तल और एक समतल-अवतल लेंस, जिनकी वक्रता त्रिज्या 'R' है वो अलग पदार्थों के बने हैं। इन दोनों को चित्रानुसार चिपका दिया जाता है। यदि लेंस-1 के पदार्थ का अपवर्तनांक μ_1 तथा लेंस-2 के पदार्थ का अपवर्तनांक μ_2 है तो इस संयोजन की फोकस दूरी होगी :



Options :

1. $\frac{R}{\mu_1 - \mu_2}$

2. $\frac{2R}{\mu_1 - \mu_2}$

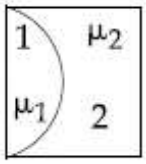
3. $\frac{R}{2(\mu_1 - \mu_2)}$

4. $\frac{R}{2-(\mu_1 - \mu_2)}$

Question Number : 23 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

સમાન વક્રતા ત્રિજ્યા 'R' પરંતુ જુદા-જુદા દ્રવ્યના બનેલા એક સમતલીય-બહિર્ગોળ (plano-convex) અને સમતલીય અંતર્ગોળ (plano-concave) ને એકબીજા સાથે આકૃતિમાં દર્શાવ્યા મુજબ ચોંટાડવામાં આવ્યા છે. જો દ્રવ્ય 1 નો વક્રીભવનાંક μ_1 અને બીજા 2 નો μ_2 હોય તો આ સંયોજનની કેન્દ્રલંબાઇ છે :



Options :

1. $\frac{R}{\mu_1 - \mu_2}$

2. $\frac{2R}{\mu_1 - \mu_2}$

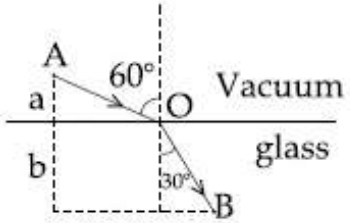
3. $\frac{R}{2(\mu_1 - \mu_2)}$

4. $\frac{R}{2-(\mu_1 - \mu_2)}$

Question Number : 24 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A ray of light AO in vacuum is incident on a glass slab at angle 60° and refracted at angle 30° along OB as shown in the figure. The optical path length of light ray from A to B is :



Options :

1. $2a + \frac{2b}{\sqrt{3}}$

2. $\frac{2\sqrt{3}}{a} + 2b$

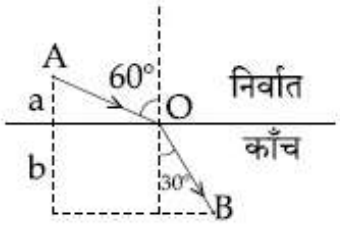
3. $2a+2b$

4. $2a+\frac{2b}{3}$

Question Number : 24 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक प्रकाश की किरण AO निर्वात से काँच में 60° के कोण पर आपतित है तथा इसका अपवर्तन 30° के कोण पर OB के समदिश चित्रानुसार होता है। इस किरण की A से B तक प्रकाशिक पथ लम्बाई (optical path length) होगी :



Options :

1. $2a+\frac{2b}{\sqrt{3}}$

2. $\frac{2\sqrt{3}}{a}+2b$

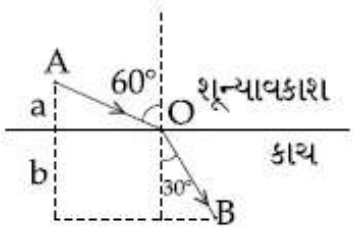
3. $2a+2b$

4. $2a+\frac{2b}{3}$

Question Number : 24 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

શૂન્યાવકાશમાં એક પ્રકાશ કિરણ AO એક કાચ (ગ્લાસ) પર 60° કોણે આપાત થાય છે અને 30° ના કોણે OB ની દિશામાં વક્રીભૂત થાય છે. પ્રકાશ કિરણની A થી B ની પ્રકાશીય પથ લંબાઇ _____ થશે.



Options :

1. $2a+\frac{2b}{\sqrt{3}}$

2. $\frac{2\sqrt{3}}{a}+2b$

3. $2a+2b$

4. $2a+\frac{2b}{3}$

Question Number : 25 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In a photoelectric effect experiment the threshold wavelength of light is 380 nm. If the wavelength of incident light is 260 nm, the maximum kinetic energy of emitted electrons will be :

Given E (in eV) $= \frac{1237}{\lambda(\text{in nm})}$

Options :

1. 3.0 eV

2. 4.5 eV

3. 15.1 eV

4. 1.5 eV

Question Number : 25 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक प्रकाश विद्युत प्रवाह प्रयोग में प्रकाश की देहली तरंगदैर्घ्य 380 nm है। यदि आपतित किरण की तंरगदैर्घ्य 260 nm हो तो उत्सर्जित इलैक्ट्रॉनों की अधिकतम गतिज ऊर्जा होगी :

दिया है : E (in eV) $= \frac{1237}{\lambda(\text{in nm})}$

Options :

1. 3.0 eV

2. 4.5 eV

3. 15.1 eV

4. 1.5 eV

Question Number : 25 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એક ફોટોઇલેક્ટ્રીક અસરના પ્રયોગમાં આપાત પ્રકાશની થ્રેશોલ્ડ તરંગલંબાઇ 380 nm છે. જો આપાત પ્રકાશ ની તરંગલંબાઇ 260 nm હોય તો ઉત્સર્જિત ઇલેક્ટ્રોનોની મહત્તમ ગતિઉર્જા _____ થશે.

અહીં E (eV માં) $= \frac{1237}{\lambda(\text{nm})}$

Options :

1. 3.0 eV

2. 4.5 eV

3. 15.1 eV

4. 1.5 eV

Question Number : 26 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Two radioactive materials A and B have decay constants 10λ and λ, respectively. If initially they have the same number of nuclei, then the ratio of the number of nuclei of A to that of B will be $1/e$ after a time :

Options :

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

2. $\frac{1}{11\lambda}$

3. $\frac{11}{10\lambda}$

4. $\frac{1}{9\lambda}$

Question Number : 26 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दो रेडियोधर्मी पदार्थों A तथा B के क्षय नियतांक, क्रमशः, 10λ तथा λ हैं। यदि आरम्भ में उनके नाभिकों की संख्या बराबर हो तो कितने समय बाद A तथा B के नाभिकों की संख्या का अनुपात $1/e$ होगा :

Options :

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

2. $\frac{1}{11\lambda}$

3. $\frac{11}{10\lambda}$

4. $\frac{1}{9\lambda}$

Question Number : 26 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

બે રેડિયોએક્ટિવ પદાર્થો A અને B નાં ક્ષયનિયતાંક અનુક્રમે 10λ અને λ છે. જો પ્રારંભમાં તેઓમાં સમાન સંખ્યાના ન્યુક્લિયસો હોય તો A અને B ના ન્યુક્લિયસોની સંખ્યાનો ગુણોત્તર $1/e$ થાય તે માટેનો સમય _____ થશે.

Options :

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

2. $\frac{1}{11\ \lambda}$

3. $\frac{11}{10\ \lambda}$

4. $\frac{1}{9\ \lambda}$

Question Number : 27 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

An npn transistor operates as a common emitter amplifier, with a power gain of 60 dB. The input circuit resistance is 100 Ω and the output load resistance is 10 kΩ. The common emitter current gain β is :

Options :

1. 6×10^2

2. 60

3. 10^2

4. 10^4

Question Number : 27 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक npn ट्रांजिस्टर 60 dB शक्ति लब्धि वाले उभयनिष्ठ उत्सर्जक प्रवर्धक के रूप में काम करता है। इस परिपथ का निवेशी प्रतिरोध 100 Ω तथा निर्गत लोड प्रतिरोध 10 kΩ है। उभयनिष्ठ उत्सर्जक धारा लब्धि β है :

Options :

1. 6×10^2

2. 60

3. 10^2

4. 10^4

Question Number : 27 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એક npn ટ્રાન્ઝીસ્ટર 60 dB જેટલા પાવર ગેઇન સાથે કોમન એમીટર એંપ્લીફાયર તરીકે વર્તે છે. પરિપથનો ઇનપુટ અવરોધ 100 Ω અને આઉટપુટ લોડ (ભાર) અવરોધ 10 kΩ છે. કોમન એમીટરની પ્રવાહ લબ્ધિ β _____ છે.

Options :

1. 6×10^2

2. 60

3. 10^2

4. 10^4

Question Number : 28 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A message signal of frequency 100 MHz and peak voltage 100 V is used to execute amplitude modulation on a carrier wave of frequency 300 GHz and peak voltage 400 V. The modulation index and difference between the two side band frequencies are :

Options :

1. $0.25 ; 1 \times 10^8$ Hz

2. $4 ; 2 \times 10^8$ Hz

3. $0.25 ; 2 \times 10^8$ Hz

4. $4 ; 1 \times 10^8$ Hz

Question Number : 28 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

100 MHz आवृत्ति तथा शिखर वोल्टता 100 V के एक सूचना सिग्नल का उपयोग 300 GHz आवृत्ति तथा शिखर वोल्टता 400 V की एक वाहक तरंग का आयाम मॉडुलन करने के लिये करते है। मॉडुलन सूचकांक तथा दोनों पार्श्व बैण्ड की आवृत्तियों का अन्तर होगा :

Options :

1. $0.25 ; 1 \times 10^8$ Hz

2. $4 ; 2 \times 10^8$ Hz

3. $0.25 ; 2 \times 10^8$ Hz

4. $4 ; 1 \times 10^8$ Hz

Question Number : 28 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

100 MHz આવૃત્તિ અને 100 V પીક્ (મહત્તમ) વોલ્ટેજ વાળા એક સંદેશા સંકેત (message signal) ને 300 GHz આવૃત્તિ અને 400 V પીક્ વોલ્ટેજ વાળા કેરિયર તરંગ (carrier wave) પર એંપ્લીટ્યુડ્ માડ્યુલેશન તરીકે વાપરવામા આવે છે. માડ્યુલેશન ઇંડેક્સ અને બે સાઇડ બેંડ ની આવૃત્તિ વચ્ચેનો તફાવત _____ છે.

Options :

1. $0.25 ; 1 \times 10^8$ Hz

2. $4 ; 2 \times 10^8$ Hz

3. $0.25 ; 2 \times 10^8$ Hz

4. $4 ; 1 \times 10^8$ Hz

Question Number : 29 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A moving coil galvanometer allows a full scale current of 10^{-4} A. A series resistance of 2 MΩ is required to convert the above galvanometer into a voltmeter of range 0 - 5 V. Therefore the value of shunt resistance required to convert the above galvanometer into an ammeter of range 0-10 mA is :

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. 200 Ω

2. 100 Ω

3. 500 Ω

4. 10 Ω

Question Number : 29 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक चल कुंडली गैल्वेनोमीटर, की पूर्ण विक्षेप धारा का मान 10^{-4} A है। इसको एक 0 - 5 V परास के वोल्टमीटर में बदलने के लिये 2 MΩ के प्रतिरोध की आवश्यकता होती है। तो इसे एक 0-10 mA परास के अमीटर में बदलने के लिये किस शंट प्रतिरोध की आवश्यकता होगी :

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. 200 Ω

2. 100 Ω

3. 500 Ω

4. 10 Ω

Question Number : 29 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એક ચલિત ગૂંચળા ધરાવતા ગેલ્વેનોમીટરમાંથી 10^{-4} A જેટલો મહત્તમ પ્રવાહ પસાર થઇ શકે છે. આ ગેલ્વેનોમીટરને 0 - 5 V રેન્જ ધરાવતા વોલ્ટમીટરમાં રૂપાંતરીત કરવા માટે એક 2 MΩ નાં શ્રેણી અવરોધની જરૂર પડે છે. તેથી ઉપરોક્ત ગેલ્વેનોમીટર ને 0-10 mA રેન્જ ધરાવતા એમીટરમાં રૂપાંતર કરવા જરૂરી શંટ છે :

Note: For this question, discrepancy is found in question/answer. Full Marks is being awarded to all candidates.

Options :

1. 200 Ω

2. 100 Ω

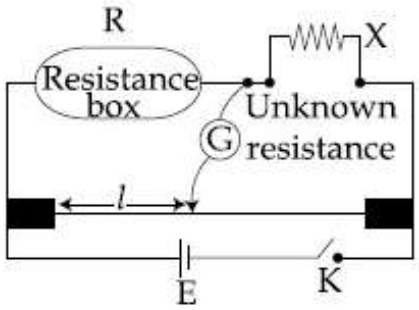
3. 500 Ω

4. 10 Ω

Question Number : 30 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In a meter bridge experiment, the circuit diagram and the corresponding observation table are shown in figure.



Sl. No.	R (Ω)	l (cm)
1.	1000	60
2.	100	13
3.	10	1.5
4.	1	1.0

Which of the readings is inconsistent ?

Options :

1. 1

2. 2

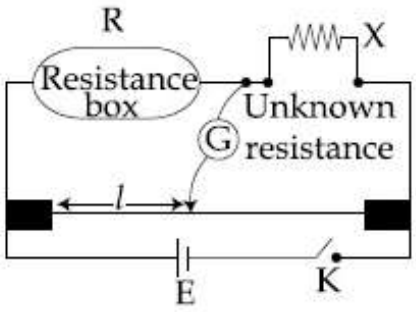
3. 3

4. 4

Question Number : 30 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक मीटर सेतू प्रयोग के लिये, परिपथ तथा संगत परीक्षण सारणी चित्र में दिये गये हैं।



Sl. No.	R (Ω)	l (cm)
1.	1000	60
2.	100	13
3.	10	1.5
4.	1	1.0

इनमें कौन सा पाठ्यांक असंगत है?

Options :

1. 1

2. 2

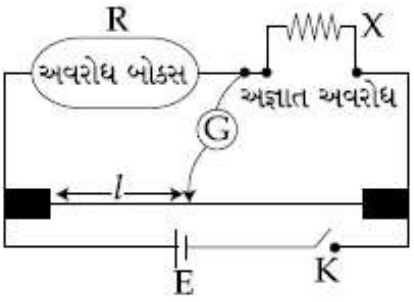
3. 3

4. 4

Question Number : 30 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એક મીટર બ્રીજ પ્રયોગનાં અવલોકન અને પરિપથ આકૃતિમાં બતાવ્યા છે.



ક્રમ	R (Ω)	l (cm)
1.	1000	60
2.	100	13
3.	10	1.5
4.	1	1.0

નીચેનું કયું અવલોકન યોગ્ય રીતે લઇ શકાય નહી?

Options :

1. 1

2. 2

3. 3

4. 4

Chemistry

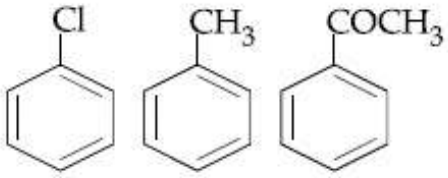
Section Id :	416529266
Section Number :	2
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	416529406
Question Shuffling Allowed :	Yes

Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The increasing order of the reactivity of the following compounds towards electrophilic aromatic substitution reactions is :



(I) (II) (III)

Options :

1. II < I < III

2. I < III < II

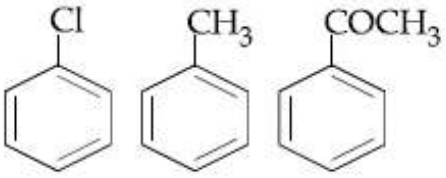
3. III < I < II

4. III < II < I

Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एरोमैटिक इलेक्ट्रॉन स्नेही प्रतिस्थापन अभिक्रियाओं में निम्नलिखित यौगिकों की बढ़ती अभिक्रियात्मकता का **सही** क्रम है :



(I) (II) (III)

Options :

1. II < I < III

2. I < III < II

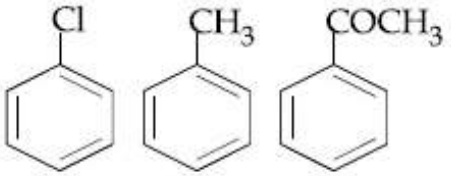
3. III < I < II

4. III < II < I

Question Number : 31 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા સંયોજનો નો ઈલેક્ટ્રોન અનુરાગી એરોમેટિક વિસ્થાપન પ્રક્રિયા માટેની સક્રિયતા નો ચઢતો ક્રમ શોધો.



(I) (II) (III)

Options :

1. II < I < III

2. I < III < II

3. III < I < II

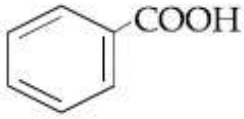
4. III < II < I

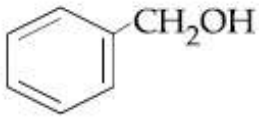
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

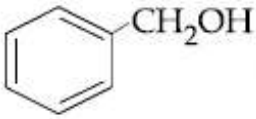
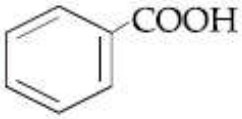
Correct Marks : 4 Wrong Marks : 1

Major products of the following reaction are :

Options :

1. CH_3OH and 

2. HCOOH and 

3.  and 

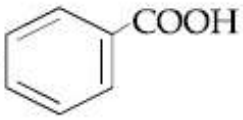
4. CH_3OH and HCO_2H

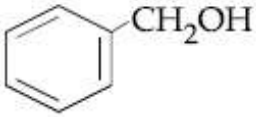
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

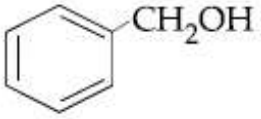
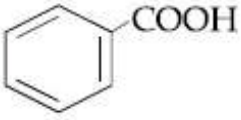
Correct Marks : 4 Wrong Marks : 1

निम्न अभिक्रिया के मुख्य उत्पाद हैं :

Options :

1. CH_3OH तथा 

2. HCOOH तथा 

3.  तथा 

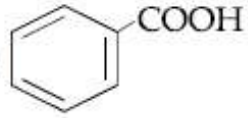
4. CH_3OH तथा HCO_2H

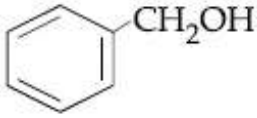
Question Number : 32 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

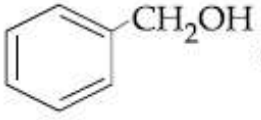
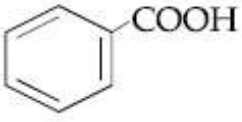
Correct Marks : 4 Wrong Marks : 1

નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો -

Options :

1. CH_3OH અને 

2. HCOOH અને 

3.  અને 

4. CH_3OH અને HCO_2H

Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Amylopectin is composed of :

Options :

1. α-D-glucose, $C_1 - C_4$ and $C_2 - C_6$ linkages

2. β-D-glucose, $C_1 - C_4$ and $C_1 - C_6$ linkages

3. α-D-glucose, $C_1 - C_4$ and $C_1 - C_6$ linkages

4. β-D-glucose, $C_1 - C_4$ and $C_2 - C_6$ linkages

Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एमिलोपेक्टिन इनसे निर्मित है :

Options :

1. α-D-ग्लुकोज, $C_1 - C_4$ तथा $C_2 - C_6$ बंध

2. β-D-ग्लुकोज, $C_1 - C_4$ तथा $C_1 - C_6$ बंध

3. α-D-ग्लुकोज, $C_1 - C_4$ तथा $C_1 - C_6$ बंध

4. β-D-ग्लुकोज, $C_1 - C_4$ तथा $C_2 - C_6$ बंध

Question Number : 33 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એમાયલો પેક્ટિન શાનો બનેલો છે.

Options :

1. α-D-ગ્લુકોઝ, $C_1 - C_4$ અને $C_2 - C_6$ જોડાણો

2. β-D-ગ્લુકોઝ, $C_1 - C_4$ અને $C_1 - C_6$ જોડાણો

3. α-D-ગ્લુકોઝ, $C_1 - C_4$ અને $C_1 - C_6$ જોડાણો

4. β-D-ગ્લુકોઝ, $C_1 - C_4$ અને $C_2 - C_6$ જોડાણો

Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The principle of column chromatography is :

Options :

1. Differential adsorption of the substances on the solid phase.

2. Differential absorption of the substances on the solid phase.

3. Capillary action.

4. Gravitational force.

Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

स्तम्भ वर्णलेखिकी का सिद्धान्त है :

Options :

1. ठोस प्रावस्था पर पदार्थों के अंतरात्मक अधिशोषण

2. ठोस प्रावस्था पर पदार्थों के अंतरात्मक अवशोषण

3. कोशिका क्रिया

4. गुरुत्वीय बल

Question Number : 34 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

સ્તંભ ક્રોમટોગ્રાફી નો સિધ્ધાંત :

Options :

1. ઘન અવસ્થા ઉપર પદાર્થોનું તફાવતીય અધિશોષણ

2. ઘન અવસ્થા ઉપર પદાર્થોનું તફાવતીય અવશોષણ

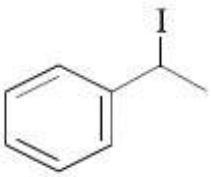
3. કેપીલરી-ક્રિયા

4. ગુરુત્વાકર્ષણ બળ

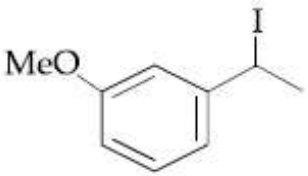
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

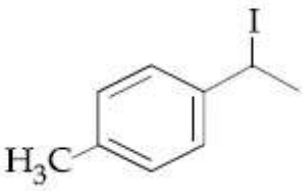
Increasing rate of S_N1 reaction in the following compounds is :



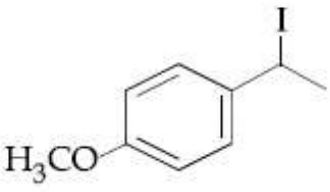
(A)



(B)



(C)



(D)

Options :

1. (B) < (A) < (D) < (C)

2. (B) < (A) < (C) < (D)

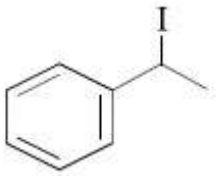
3. (A) < (B) < (C) < (D)

4. (A) < (B) < (D) < (C)

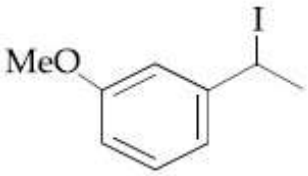
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

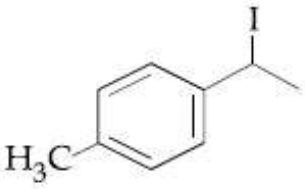
निम्न यौगिकों में S_N1 अभिक्रिया की बढ़ती दर होगी :



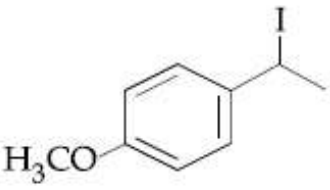
(A)



(B)



(C)



(D)

Options :

1. (B) < (A) < (D) < (C)

2. (B) < (A) < (C) < (D)

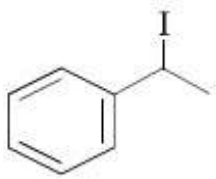
3. (A) < (B) < (C) < (D)

4. (A) < (B) < (D) < (C)

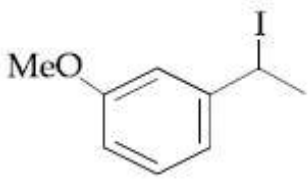
Question Number : 35 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

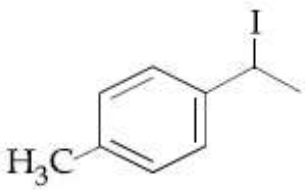
નીચે આપેલા સંયોજનો માટે S_N1 પ્રક્રિયાનો ચઢતો ક્રમ શોધો



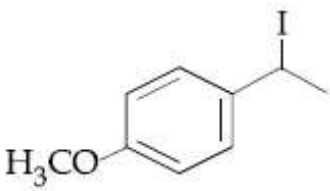
(A)



(B)



(C)



(D)

Options :

1. (B) < (A) < (D) < (C)

2. (B) < (A) < (C) < (D)

3. (A) < (B) < (C) < (D)

4. (A) < (B) < (D) < (C)

Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Ethylamine ($C_2H_5NH_2$) can be obtained from N-ethylphthalimide on treatment with :

Options :

1. CaH_2

2. $NaBH_4$

3. H_2O

4. NH_2NH_2

Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न में से किसके साथ अभिकृत किये जाने पर N - एथिलथैलीमाइड से एथिलऐमीन ($C_2H_5NH_2$) प्राप्त किया जा सकता है?

Options :

1. CaH_2

2. $NaBH_4$

3. H_2O

4. NH_2NH_2

Question Number : 36 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

N -ઈથાઈલપ્થેલિમાઈડ ને નીચે આપેલા ક્યા સંયોજન સાથે પ્રક્રિયા કરી ઈથાઈલ એમાઈન ($C_2H_5NH_2$) મેળવી શકાય?

Options :

1. CaH_2

2. $NaBH_4$

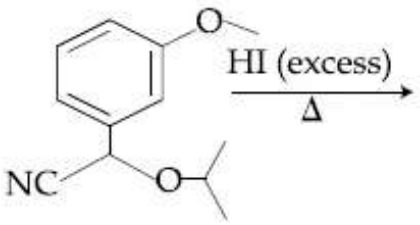
3. H_2O

4. NH_2NH_2

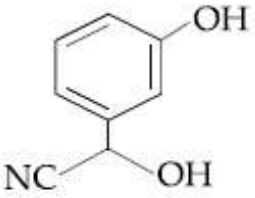
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

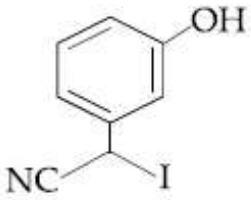
Correct Marks : 4 Wrong Marks : 1

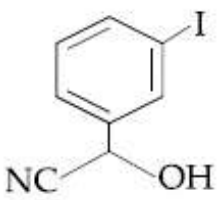
The major product of the following reaction is :

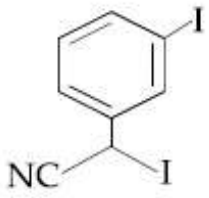


Options :

1. 

2. 

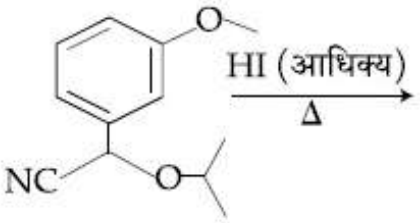
3. 

4. 

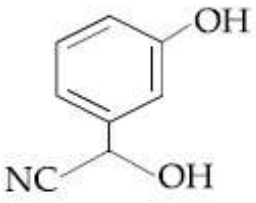
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

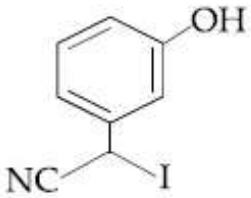
Correct Marks : 4 Wrong Marks : 1

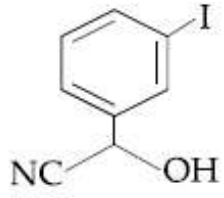
निम्न अभिक्रिया का मुख्य उत्पाद है :

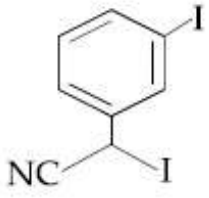


Options :

1. 

2. 

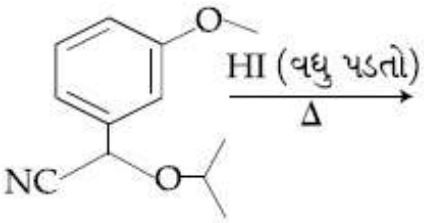
3. 

4. 

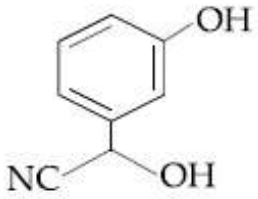
Question Number : 37 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

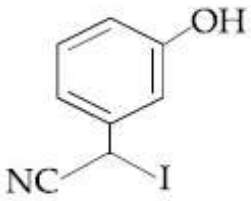
Correct Marks : 4 Wrong Marks : 1

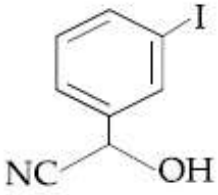
નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો?

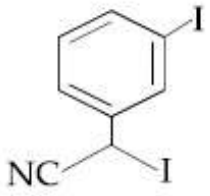


Options :

1. 

2. 

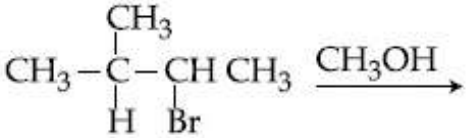
3. 

4. 

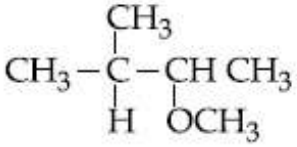
Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

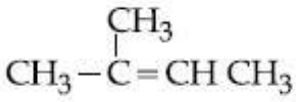
Correct Marks : 4 Wrong Marks : 1

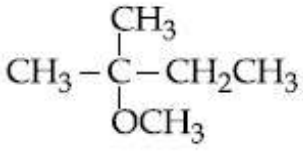
The major product of the following reaction is :

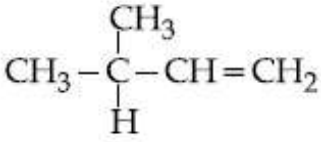


Options :

1. 

2. 

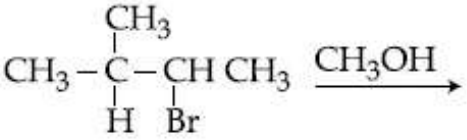
3. 

4. 

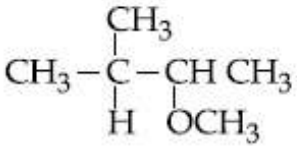
Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

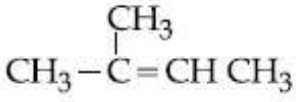
Correct Marks : 4 Wrong Marks : 1

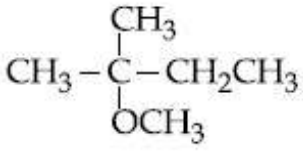
निम्न अभिक्रिया का मुख्य उत्पाद है :

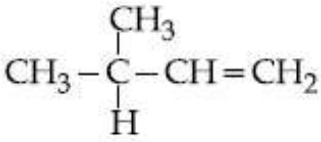


Options :

1. 

2. 

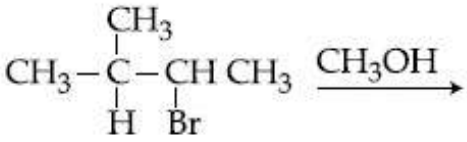
3. 

4. 

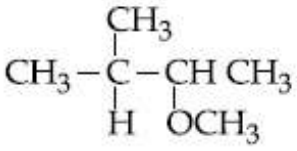
Question Number : 38 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

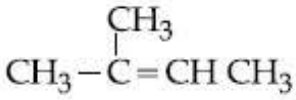
Correct Marks : 4 Wrong Marks : 1

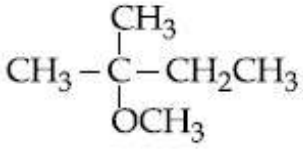
નીચે આપેલી પ્રક્રિયાની મુખ્ય નીપજ શોધો?

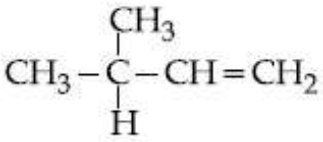


Options :

1. 

2. 

3. 

4. 

Question Number : 39 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Which of the following is a condensation polymer ?

Options :

1. Buna - S

2. Nylon 6, 6

3. Teflon

4. Neoprene

Question Number : 39 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न में से कौन संघनन बहुलक है?

Options :

1. ब्यूना - S

2. નાયલૉન 6, 6

3. ટેફ્લૉન

4. નિઓપ્રીન

Question Number : 39 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીતે આપેલામાંથી ક્યો સંઘનન બહુલક છે?

Options :

1. બ્યુના-S

2. નાયલોન 6, 6

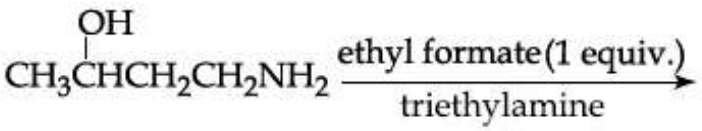
3. ટેફલોન

4. નિયોપ્રીન

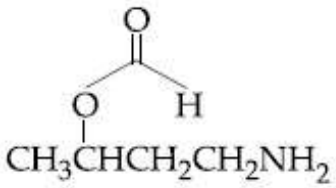
Question Number : 40 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :

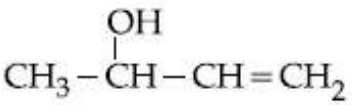


Options :

1. 

2. 

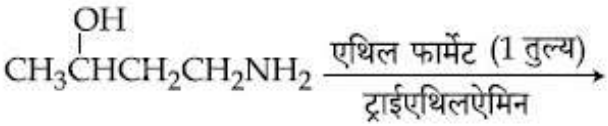
3. $CH_3CH=CH-CH_2NH_2$

4. 

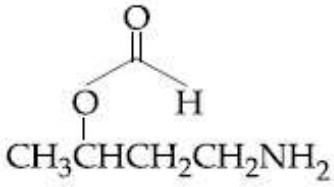
Question Number : 40 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

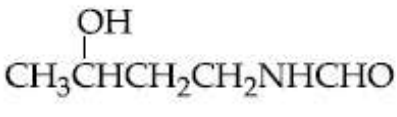
Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :

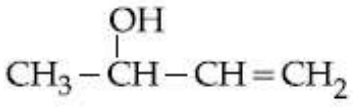


Options :

1. 

2. 

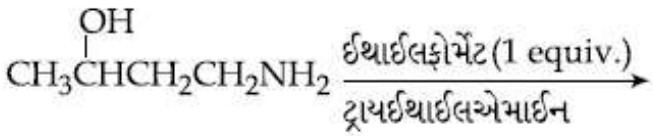
3. 

4. 

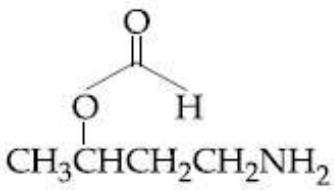
Question Number : 40 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચેની પ્રક્રિયાની મુખ્ય નીપજ છે :

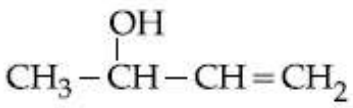


Options :

1. 

2. 

3. 

4. 

Question Number : 41 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The isoelectronic set of ions is :

Options :

1. N^{3-}, O^{2-}, F^{-} and Na^{+}

2. Li^{+}, Na^{+}, O^{2-} and F^{-}

3. N^{3-}, Li^{+}, Mg^{2+} and O^{2-}

4. F^{-}, Li^{+}, Na^{+} and Mg^{2+}

Question Number : 41 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

आयनों का समइलेक्ट्रॉनिकी सेट है :

Options :

1. N^{3-}, O^{2-}, F^{-} तथा Na^{+}

2. Li^{+}, Na^{+}, O^{2-} तथा F^{-}

3. N^{3-}, Li^{+}, Mg^{2+} तथा O^{2-}

4. F^{-}, Li^{+}, Na^{+} तथा Mg^{2+}

Question Number : 41 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

આયનોની સમઈલેક્ટ્રોનીય જોડ કઈ?

Options :

1. N^{3-}, O^{2-}, F^{-} અને Na^{+}

2. Li^{+}, Na^{+}, O^{2-} અને F^{-}

3. N^{3-}, Li^{+}, Mg^{2+} અને O^{2-}

4. F^-, Li^+, Na^+ અને Mg^{2+}

Question Number : 42 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Match the refining methods (Column I) with metals (Column II).

Column I (Refining methods)		Column II (Metals)	
(I)	Liquation	(a)	Zr
(II)	Zone Refining	(b)	Ni
(III)	Mond Process	(c)	Sn
(IV)	Van Arkel Method	(d)	Ga

Options :

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

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

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

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

Question Number : 42 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

परिष्करण विधियों (**कालम I**) का धातुओं (**कालम II**) के साथ सुमेल कीजिए।

कालम I (परिष्करण विधि)		कालम II (धातुयें)	
(I)	गलनिक पृथक्करण	(a)	Zr
(II)	जोन रिफाइनिंग	(b)	Ni
(III)	मान्ड प्रक्रम	(c)	Sn
(IV)	वान आर्कल विधि	(d)	Ga

Options :

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

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

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

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

Question Number : 42 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

શુદ્ધિકરણની પદ્ધિતીઓ (સ્તંભ I) ને ધાતુઓ (સ્તંભ II) સાથે જોડો

સ્તંભ I (શુદ્ધિકરણની પદ્ધિતીઓ)		સ્તંભ II (ધાતુઓ)	
(I)	દ્રવગલન	(a)	Zr
(II)	ઝોન શુદ્ધિકરણ	(b)	Ni
(III)	મોન્ડ પ્રક્રમ	(c)	Sn
(IV)	વેન આર્કલ પધ્ધતિ	(d)	Ga

Options :

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

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

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

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

Question Number : 43 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The synonym for water gas when used in the production of methanol is :

Options :

1. fuel gas

2. natural gas

3. laughing gas

4. syn gas

Question Number : 43 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वाटर गैस के लिये समानार्थक शब्द जब मेथेनॉल के उत्पादन में प्रयुक्त किया जाता है, होता है :

Options :

1. फ्यूअल गैस

2. नेचुरल गैस

3. लाफिंग गैस

4. सिन गैस

Question Number : 43 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જળવાયુ (વૉટર ગેસ) જ્યારે મિથેનોલની બનાવટમા વપરાય છે ત્યારે તેનો સમાનાર્થી કયો?

Options :

1. બળતણ વાયુ

2. કુદરતી વાયુ

3. લાઈંગ ગેસ

4. સીન ગેસ

Question Number : 44 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The alloy used in the construction of aircrafts is :

Options :

1. Mg - Al

2. Mg - Sn

3. Mg - Zn

4. Mg - Mn

Question Number : 44 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एयरक्राफ्टों(विमानों) के निर्माण में प्रयुक्त होनेवाला ऐलॉय (मिश्रधातु) है :

Options :

1. Mg - Al

2. Mg - Sn

3. Mg - Zn

4. Mg - Mn

Question Number : 44 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

વિમાનોની રચનામા વપરાતી મિશ્રધાતુ કઈ?

Options :

1. Mg - Al

2. Mg - Sn

3. Mg - Zn

4. Mg - Mn

Question Number : 45 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The oxoacid of sulphur that does not contain bond between sulphur atoms is :

Options :

1. $H_2S_2O_4$

2. $H_2S_4O_6$

3. $H_2S_2O_3$

4. $H_2S_2O_7$

Question Number : 45 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

सल्फर का वह आक्सोएसिड जिसमें सल्फर के परमाणुओं के बीच आबन्ध **नहीं** होता, है :

Options :

1. $H_2S_2O_4$

2. $H_2S_4O_6$

3. $H_2S_2O_3$

4. $H_2S_2O_7$

Question Number : 45 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

સલ્ફરનો ઓક્સોએસિડ, જે સલ્ફરના પરમાણુઓ વચ્ચે બંધ ધરાવતો નથી તે :

Options :

1. $H_2S_2O_4$

2. $H_2S_4O_6$

3. $H_2S_2O_3$

4. $H_2S_2O_7$

Question Number : 46 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The correct order of catenation is :

Options :

1. $Si > Sn > C > Ge$

2. $Ge > Sn > Si > C$

3. $C > Si > Ge \approx Sn$

4. $C > Sn > Si \approx Ge$

Question Number : 46 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

શૃંખલન का सही क्रम है :

Options :

1. $Si > Sn > C > Ge$

2. $Ge > Sn > Si > C$

3. $C > Si > Ge \approx Sn$

4. $C > Sn > Si \approx Ge$

Question Number : 46 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

કેટેનેશનનો સાચો ક્રમાંક છે :

Options :

1. $Si > Sn > C > Ge$

2. $Ge > Sn > Si > C$

3. $C > Si > Ge \approx Sn$

4. $C > Sn > Si \approx Ge$

Question Number : 47 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Consider the hydrated ions of Ti^{2+}, V^{2+}, Ti^{3+}, and Sc^{3+}. The correct order of their spin-only magnetic moments is :

Options :

1. $Sc^{3+} < Ti^{3+} < Ti^{2+} < V^{2+}$

2. $Ti^{3+} < Ti^{2+} < Sc^{3+} < V^{2+}$

3. $Sc^{3+} < Ti^{3+} < V^{2+} < Ti^{2+}$

4. $V^{2+} < Ti^{2+} < Ti^{3+} < Sc^{3+}$

Question Number : 47 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Ti^{2+}, V^{2+}, Ti^{3+} तथा Sc^{3+} के जलयोजित आयनों पर विचार कीजिये । उनके स्पिन-मात्र चुम्बकीय आघूर्णों का सही क्रम है :

Options :

1. $Sc^{3+} < Ti^{3+} < Ti^{2+} < V^{2+}$

2. $Ti^{3+} < Ti^{2+} < Sc^{3+} < V^{2+}$

3. $Sc^{3+} < Ti^{3+} < V^{2+} < Ti^{2+}$

4. $V^{2+} < Ti^{2+} < Ti^{3+} < Sc^{3+}$

Question Number : 47 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Ti^{2+}, V^{2+}, Ti^{3+} અને Sc^{3+} જલયોજિત આયનો ધ્યાનમાં લો. તેમની ફક્ત સ્પીન ચુંબકીય ચાકમાત્રાનો સાચો ક્રમ કયો?

Options :

1. $Sc^{3+} < Ti^{3+} < Ti^{2+} < V^{2+}$

2. $Ti^{3+} < Ti^{2+} < Sc^{3+} < V^{2+}$

3. $Sc^{3+} < Ti^{3+} < V^{2+} < Ti^{2+}$

4. $V^{2+} < Ti^{2+} < Ti^{3+} < Sc^{3+}$

Question Number : 48 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Three complexes,

$[CoCl(NH_3)_5]^{2+}$ (I),

$[Co(NH_3)_5 H_2O]^{3+}$ (II) and

$[Co(NH_3)_6]^{3+}$ (III)

absorb light in the visible region. The correct order of the wavelength of light absorbed by them is :

Options :

1. (II) > (I) > (III)

2. (I) > (II) > (III)

3. (III) > (I) > (II)

4. (III) > (II) > (I)

Question Number : 48 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

तीन संकर,

$[CoCl(NH_3)_5]^{2+}$ (I),

$[Co(NH_3)_5 H_2O]^{3+}$ (II) तथा

$[Co(NH_3)_6]^{3+}$ (III)

दृश्य क्षेत्र में प्रकाश अवशोषित करते हैं। इनके द्वारा अवशोषित प्रकाश के तरंगदैर्घ्य का **सही** क्रम होगा :

Options :

1. (II) > (I) > (III)

2. (I) > (II) > (III)

3. (III) > (I) > (II)

4. (III) > (II) > (I)

Question Number : 48 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ત્રણ સંકીર્ણો

$[CoCl(NH_3)_5]^{2+}$ (I)

$[Co(NH_3)_5 H_2O]^{3+}$ (II) અને

$[Co(NH_3)_6]^{3+}$ (III)

દશ્યમાન વિસ્તારમાં પ્રકાશનું શોષણ કરે છે. તેઓ દ્વારા શોષાતા પ્રકાશની તરંગલંબાઈનો સાચો ક્રમ છે :

Options :

1. (II) > (I) > (III)

2. (I) > (II) > (III)

3. (III) > (I) > (II)

4. (III) > (II) > (I)

Question Number : 49 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The species that can have a *trans*-isomer is :

(en = ethane-1, 2-diamine, ox = oxalate)

Options :

1. $[Pt(en)Cl_2]$

2. $[Zn(en)Cl_2]$

3. $[Cr(en)_2(ox)]^+$

4. $[Pt(en)_2Cl_2]^{2+}$

Question Number : 49 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वह स्पीशीज़ जिसका एक *ट्रांस*-आइसोमर हो सकता है, है :

(en = इथेन-1, 2-डाइएमीन, ox = आक्जेलेट)

Options :

1. $[Pt(en)Cl_2]$

2. $[Zn(en)Cl_2]$

3. $[Cr(en)_2(ox)]^+$

4. $[Pt(en)_2Cl_2]^{2+}$

Question Number : 49 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

સ્પીશીઝ કે જે ટ્રાન્સ સમઘટક ધરાવે છે :

(en = ઈથેન,-1, 2-ડાયએમાઈન, ox = ઓક્ઝેલેટ)

Options :

1. $[Pt(en)Cl_2]$

2. $[Zn(en)Cl_2]$

3. $[Cr(en)_2(ox)]^+$

4. $[Pt(en)_2Cl_2]^{2+}$

Question Number : 50 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The regions of the atmosphere, where clouds form and where we live, respectively, are :

Options :

1. Troposphere and Troposphere

2. Troposphere and Stratosphere

3. Stratosphere and Troposphere

4. Stratosphere and Stratosphere

Question Number : 50 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वायुमंडल का वह भाग जहाँ बादल बनते हैं तथा जिसमें हम रहते हैं, उसे क्रमश: कहते हैं :

Options :

1. ट्रोपोस्फीयर (क्षोभमंडल) तथा ट्रोपोस्फीयर

2. ट्रोपोस्फीयर तथा स्ट्रेटोस्फीयर (समतापमंडल)

3. स्ट्रेटोस्फीयर तथा ट्रोपोस्फीयर

4. स्ट्रेटोस्फीयर तथा स्ट्रेटोस्फीयर

Question Number : 50 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

વાતાવરણના એ વિસ્તારો કે જ્યાં વાદળો બને છે અને આપણો રહીએ છીએ તે અનુક્રમે છે :

Options :

1. ક્ષોભ આવરણ અને ક્ષોભ આવરણ

2. ક્ષોભ આવરણ અને સમતાપ આવરણ

3. સમતાપ આવરણ અને ક્ષોભ આવરણ

4. સમતાપ આવરણ અને સમતાપ આવરણ

Question Number : 51 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

At 300 K and 1 atmospheric pressure, 10 mL of a hydrocarbon required 55 mL of O_2 for complete combustion, and 40 mL of CO_2 is formed. The formula of the hydrocarbon is :

Options :

1. C_4H_6

2. C_4H_8

3. C_4H_{10}

4. C_4H_7Cl

Question Number : 51 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

300 K तथा 1 वायुमंडलीय दाब पर, एक हाइड्रोकार्बन के 10 mL के पूर्ण दहन के लिए 55 mL O_2 की आवश्यकता होती है तथा 40 mL CO_2 उत्पन्न होती है। हाइड्रोकार्बन का सूत्र है :

Options :

1. C_4H_6

2. C_4H_8

3. C_4H_{10}

4. C_4H_7Cl

Question Number : 51 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

300 K એ અને 1 વાતાવરણના દબાણે 10 mL એક હાઈડ્રોકાર્બન ને સંપૂર્ણ દહન કરવા માટે 55 mL O_2 ની જરૂર પડે છે, જ્યારે 40 mL CO_2 ઉત્પન્ન થાય છે. તો આ હાઈડ્રોકાર્બનનું સૂત્ર શોધો ?

Options :

1. C_4H_6

2. C_4H_8

3. C_4H_{10}

4. C_4H_7Cl

Question Number : 52 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Consider the following table :

Gas	a/(k Pa dm^6 mol^{-1})	b/(dm^3 mol^{-1})
A	642.32	0.05196
B	155.21	0.04136
C	431.91	0.05196
D	155.21	0.4382

a and b are van der Waals constants. The correct statement about the gases is :

Options :

1. Gas C will occupy lesser volume than gas A; gas B will be more compressible than gas D

2. Gas C will occupy more volume than gas A; gas B will be lesser compressible than gas D

3. Gas C will occupy more volume than gas A; gas B will be more compressible than gas D

4. Gas C will occupy lesser volume than gas A; gas B will be lesser compressible than gas D

Question Number : 52 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न तालिका पर विचार कीजिए :

गैस	$a/(k\,Pa\,dm^6\,mol^{-1})$	$b/(dm^3\,mol^{-1})$
A	642.32	0.05196
B	155.21	0.04136
C	431.91	0.05196
D	155.21	0.4382

a तथा b वान्डरवाल्स स्थिरांक हैं। गैसों के विषय में **सही** कथन है :

Options :

1. गैस C, गैस A की तुलना में कम आयतन घेरेगी; गैस B गैस D की तुलना में ज्यादा संपीड्य होगी।

2. गैस C, गैस A की तुलना में ज्यादा आयतन घेरेगी; गैस B, गैस D की तुलना में कम संपीड्य होगी।

3. गैस C, गैस A की तुलना में ज्यादा आयतन घेरेगी; गैस B, गैस D की तुलना में ज्यादा संपीड्य होगी।

4. गैस C, गैस A की तुलना में कम आयतन घेरेगी; गैस B, गैस D की तुलना में कम संपीड्य होगी।

Question Number : 52 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા કોઠાને ધ્યાનમાં લો :

વાયુ	a/(k Pa dm^6 mol^{-1})	b/(dm^3 mol^{-1})
A	642.32	0.05196
B	155.21	0.04136
C	431.91	0.05196
D	155.21	0.4382

a અને b વાન્ડરવાલ અચળાંકો છે આ વાયુઓ માટે સાંચુ વિધાન શોધો :

Options :

1. વાયુ C એ વાયુ A કરતા ઓછુ કદ રોકશે; વાયુ B એ વાયુ D કરતા વધુ દબનીય હશે.

2. વાયુ C એ વાયુ A કરતા વધુ કદ રોકશે; વાયુ B એ D કરતા ઓછો દબનીય હશે.

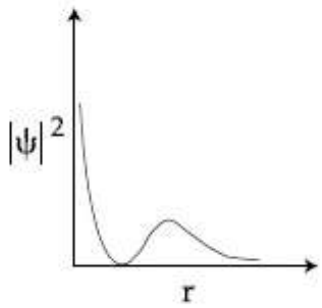
3. વાયુ C એ વાયુ A કરતા વધુ કદ રોકશે; વાયુ B એ વાયુ D કરતા વધુ દબનીય હશે.

4. વાયુ C એ વાયુ A કરતા ઓછુ કદ રોકશે; વાયુ B એ વાયુ D કરતા ઓછો દબનીય હશે.

Question Number : 53 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The graph between $|\psi|^2$ and r(radial distance) is shown below. This represents :



Options :

1. 1s orbital

2. 2s orbital

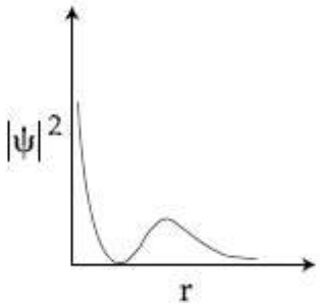
3. 3s orbital

4. 2p orbital

Question Number : 53 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$|\psi|^2$ तथा r (रेडियल दूरी) के बीच ग्राफ नीचे प्रदर्शित है। यह दर्शाता है :



Options :

1. 1s कक्षक

2. 2s कक्षक

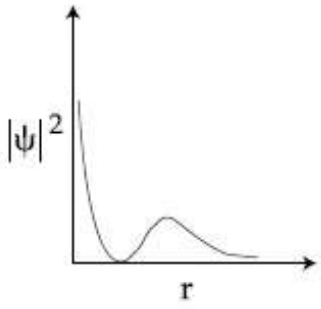
3. 3s कक्षक

4. 2p कक्षक

Question Number : 53 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$|\psi|^2$ અને r (રેડિયલ અંતર) નો આલેખ આપેલ છે તે શેનું પ્રતિનિધિત્વ કરે છે તે શોધો ?



Options :

1. 1s કક્ષક

2. 2s કક્ષક

3. 3s કક્ષક

4. 2p કક્ષક

Question Number : 54 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

During the change of O_2 to O_2^-, the incoming electron goes to the orbital :

Options :

1. $\sigma^* 2p_z$

2. $\pi^* 2p_x$

3. $\pi 2p_x$

4. $\pi 2p_y$

Question Number : 54 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

O_2 को O_2^- में परिवर्तन के समय आने वाला इलेक्ट्रॉन जिस कक्षक में जायेगा वह है :

Options :

1. $\sigma^* 2p_z$

2. $\pi^* 2p_x$

3. $\pi 2p_x$

4. $\pi 2p_y$

Question Number : 54 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

O_2 થી O_2^- ના રૂપાંતર દરમ્યાન આવનારો ઈલેક્ટ્રોન કઈ કક્ષમાં જશે :

Options :

1. $\sigma^* 2p_z$

2. $\pi^* 2p_x$

3. $\pi 2p_x$

4. $\pi 2p_y$

Question Number : 55 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A process will be spontaneous at all temperatures if :

Options :

1. $\Delta H > 0$ and $\Delta S > 0$

2. $\Delta H < 0$ and $\Delta S < 0$

3. $\Delta H < 0$ and $\Delta S > 0$

4. $\Delta H > 0$ and $\Delta S < 0$

Question Number : 55 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक प्रक्रम सभी तापों पर स्वत: होगा यदि :

Options :

1. $\Delta H > 0$ तथा $\Delta S > 0$

2. $\Delta H < 0$ तथा $\Delta S < 0$

3. $\Delta H < 0$ तथा $\Delta S > 0$

4. $\Delta H > 0$ तथा $\Delta S < 0$

Question Number : 55 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

પ્રક્રિયા દરેક તાપમાને સ્વયંભુ થશે જો :

Options :

1. $\Delta H > 0$ અને $\Delta S > 0$

2. $\Delta H < 0$ અને $\Delta S < 0$

3. $\Delta H < 0$ અને $\Delta S > 0$

4. $\Delta H > 0$ અને $\Delta S < 0$

Question Number : 56 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

At room temperature, a dilute solution of urea is prepared by dissolving 0.60 g of urea in 360 g of water. If the vapour pressure of pure water at this temperature is 35 mmHg, lowering of vapour pressure will be :
(molar mass of urea = 60 g mol^{-1})

Options :

1. 0.027 mmHg

2. 0.031 mmHg

3. 0.017 mmHg

4. 0.028 mmHg

Question Number : 56 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

कक्षताप पर, यूरिया का एक तनु विलयन 0.60 g यूरिया को 360 g जल में घोलकर बनाया जाता है। इस ताप पर यदि शुद्ध जल का वाष्प दाब 35 mmHg हो तो वाष्प दाब का अवनमन होगा :
(यूरिया का मोलर द्रव्यमान = 60 g mol^{-1})

Options :

1. 0.027 mmHg

2. 0.031 mmHg

3. 0.017 mmHg

4. 0.028 mmHg

Question Number : 56 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ઓરડાના તાપમાને, યુરિયાનું મંદ દ્રાવણ 0.60 g યુરિયાને 360 g પાણીમાં ઓગાળીને બનવવામાં આવે છે જો આ તાપમાને શુધ્ધ પાણીનું બાષ્પ દબાણ 35 mmHg તો બાષ્પદબાણમાં ઘટાડો શોધો
(યુરિયાનું મોલર દળ $= 60\ g\ mol^{-1}$)

Options :

1. 0.027 mmHg

2. 0.031 mmHg

3. 0.017 mmHg

4. 0.028 mmHg

Question Number : 57 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Consider the following statements

(a) The pH of a mixture containing 400 mL of 0.1 M H_2SO_4 and 400 mL of 0.1 M NaOH will be approximately 1.3.

(b) Ionic product of water is temperature dependent.

(c) A monobasic acid with $K_a = 10^{-5}$ has a pH = 5. The degree of dissociation of this acid is 50%.

(d) The Le Chatelier's principle is not applicable to common-ion effect.

The correct statements are :

Options :

1. (a), (b) and (c)

2. (a), (b) and (d)

3. (a) and (b)

4. (b) and (c)

Question Number : 57 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्न कथनों पर विचार कीजिये,

(a) उस मिश्रण का pH, जिसमें 400 mL 0.1 M H_2SO_4 तथा 400 mL, 0.1 M NaOH है, लगभग 1.3 होगा।

(b) जल का आयनी गुणनफल ताप पर आश्रित है।

(c) $K_a = 10^{-5}$ वाले एक एकक्षारकी अम्ल का $pH = 5$ है, इस अम्ल की वियोजन मात्रा 50% है।

(d) लि शतालिये सिद्धान्त सम आयन प्रभाव पर नहीं लागू होता है।

सही कथन हैं :

Options :

1. (a), (b) तथा (c)

2. (a), (b) तथा (d)

3. (a) तथा (b)

4. (b) तथा (c)

Question Number : 57 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચે આપેલા વિધાનો ધ્યાનમાં લો :

(a) 400 mL 0.1 M H_2SO_4 અને 400 mL, 0.1M NaOH ના મિશ્રણની pH લગભગ 1.3 થશે.

(b) પાણીનું આયનિક ગુણાકાર તાપમાન આધારિત છે.

(c) એક મોનો બેઝિક એસિડનો $K_a = 10^{-5}$ અને તેની pH = 5 છે, તો વિયોજન અંશ 50% હશે.

(d) લ્શાટેલિયરનો સિધ્ધાંત સામાન્ય આયન અસર (common-ion effect) ઘટના ને લાગુ પડતો નથી.

સાચા વિધાનો શોધો :

Options :

1. (a), (b) અને (c)

2. (a), (b) અને (d)

3. (a), (b)

4. (b), (c)

Question Number : 58 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Consider the statements S1 and S2 :

S1 : Conductivity always increases with decrease in the concentration of electrolyte.

S2 : Molar conductivity always increases with decrease in the concentration of electrolyte.

The **correct** option among the following is :

Options :

1. Both S1 and S2 are correct

2. Both S1 and S2 are wrong

3. S1 is wrong and S2 is correct

4. S1 is correct and S2 is wrong

Question Number : 58 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

S1 तथा S2 कथनों पर विचार कीजिए :

S1 : विद्युत अपघट्य की सान्द्रता में कमी के साथ चालकता सदैव बढ़ती है।

S2 : विद्युत अपघट्य की सान्द्रता में कमी आने के साथ मोलर चालकता हमेशा बढ़ती है।

निम्न में **सही** विकल्प होगा :

Options :

1. S1 तथा S2 दोनों सही हैं।

2. S1 तथा S2 दोनों गलत हैं।

3. S1 गलत है तथा S2 सही है।

4. S1 सही है तथा S2 गलत है।

Question Number : 58 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

S1 અને S2 વિધાનોને ધ્યાનમાં લો :

S1 : વિદ્યુતવિભાજ્ય નાં સાંદ્રણમાં ઘટાડો થાય તો તેની વાહકતામાં હમેશા વધારો થાય છે.

S2 : વિદ્યુતવિભાજ્ય નાં સાંદ્રણમાં ઘટાડો થાય તો તેની મોલર વાહકતામાં હમેશા વધારો થાય છે.

તો નીચેનાં પૈકી સાચો વિધાનો શોધો –

Options :

1. S1 અને S2 બંને સાચા છે.

2. S1 અને S2 બંને ખોટા છે.

3. S1 ખોટું છે અને S2 સાચુ છે.

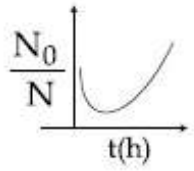
4. S1 સાચું છે અને S2 ખોટું છે.

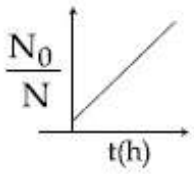
Question Number : 59 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

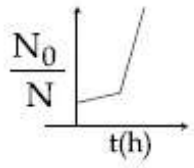
Correct Marks : 4 Wrong Marks : 1

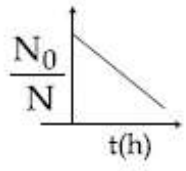
A bacterial infection in an internal wound grows as $N'(t) = N_0 \exp(t)$, where the time t is in hours. A dose of antibiotic, taken orally, needs 1 hour to reach the wound. Once it reaches there, the bacterial population goes down as $\frac{dN}{dt} = -5N^2$. What will be the plot of $\frac{N_0}{N}$ vs. t after 1 hour ?

Options :

1. 

2. 

3. 

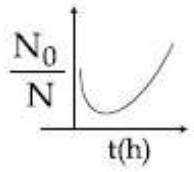
4. 

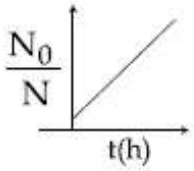
Question Number : 59 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

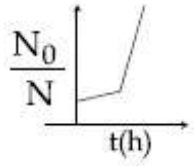
Correct Marks : 4 Wrong Marks : 1

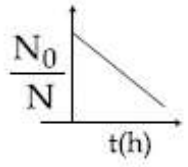
एक आंतरिक घाव में बैक्टीरिया संक्रमण इस प्रकार बढ़ता है $N'(t) = N_0 \exp(t)$, जहाँ समय t घंटे में है। मुख से एन्टीबायटिक की एक खुराक लेने पर एंटीबायटिक घाव तक पहुँचने में एक घंटे लेती है। एक बार वह वहाँ पहुँच जाती है तो बैक्टीरिया की संख्या नीचे इस प्रकार, $\frac{dN}{dt} = -5N^2$ चली जाती है। $\frac{N_0}{N}$ सापेक्ष t ग्राफ एक घंटे बाद होगा :

Options :

1. 

2. 

3. 

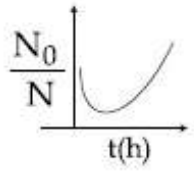
4. 

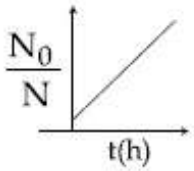
Question Number : 59 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

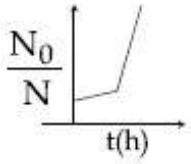
Correct Marks : 4 Wrong Marks : 1

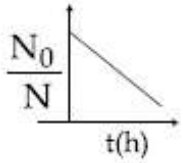
આંતરિક ઘાવમાં જીવાણુઓનું સંક્રમણ $N'(t) = N_0 \exp(t)$ થી વધે છે જ્યાં સમય t કલાકમાં છે. એન્ટીબાયોટિકની માત્રા મુખવાટે લેતા ઘાવ સુધી પહોંચવા એક કલાક લાગે છે. અને ત્યા પહોંચે પછી જીવાણુઓની સંખ્યામાં ઘટાડો થાય છે. જે $\frac{dN}{dt} = -5N^2$ છે. તો $\frac{N_0}{N}$ વિરૂધ્ધ t નો સાચો આલેખ શોધો :

Options :

1. 

2. 

3. 

4. 

Question Number : 60 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A gas undergoes physical adsorption on a surface and follows the given Freundlich adsorption isotherm equation

$$\frac{x}{m} = kp^{0.5}$$

Adsorption of the gas increases with :

Options :

1. Increase in p and increase in T

2. Increase in p and decrease in T

3. Decrease in p and increase in T

4. Decrease in p and decrease in T

Question Number : 60 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक गैस का एक पृष्ठ पर भौतिक अधिशोषण होता है और वह दिये गये फ्रायन्डलिक अधिशोषण समतापी समीकरण का अनुसरण करती है

$$\frac{x}{m} = kp^{0.5}$$

गैस का अधिशोषण बढ़ेगा यदि :

Options :

1. p बढ़ायें तथा T बढ़ायें

2. p बढ़ायें तथा T घटायें

3. p ઘટાયેં તથા T બઢ़ાયેં

4. p ઘટાયેં તથા T ઘટાયેં

Question Number : 60 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

એક વાયુનું સપાટી પર ભૌતિક અધિશોષણ થાય છે.
અને તે ફ્રુન્ડલીચ અધિશોષણ સમતાપી સમીકરણ

$\frac{x}{m} = kp^{0.5}$ ને અનુસરે છે. તો વાયુનું અધિશોષણ
વધશે જ્યારે :

Options :

1. p માં વધારો અને T માં વધારો

2. p માં વધારો અને T માં ઘટાડો

3. p માં ઘટાડો અને T માં વધારો

4. p માં ઘટાડો અને T માં ઘટાડો

Mathematics

Section Id :	416529267
Section Number :	3
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

Sub-Section Number:	1
Sub-Section Id:	416529407
Question Shuffling Allowed :	Yes

Question Number : 61 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $f(x)=x^2$, $x \in \mathbf{R}$. For any $A \subseteq \mathbf{R}$, define $g(A)=\{x \in \mathbf{R} : f(x) \in A\}$. If $S=[0, 4]$, then which one of the following statements is not true ?

Options :

1. $f(g(S)) \neq f(S)$

2. $f(g(S))=S$

3. $g(f(S)) \neq S$

4. $g(f(S))=g(S)$

Question Number : 61 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $f(x)=x^2, x \in \mathbf{R}$। किसी भी $A \subseteq \mathbf{R}$, के लिए $g(A)=\{x \in \mathbf{R} : f(x) \in A\}$ है। यदि $S=[0, 4]$ है, तो निम्न में से कौन सा एक कथन सही **नहीं** है?

Options :

1. $f(g(S)) \neq f(S)$

2. $f(g(S))=S$

3. $g(f(S)) \neq S$

4. $g(f(S))=g(S)$

Question Number : 61 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ધારો કે $f(x)=x^2$, $x \in \mathbf{R}$. કોઇપણ $A \subseteq \mathbf{R}$ માટે, $g(A)=\{x \in \mathbf{R} : f(x) \in A\}$ થી વ્યાખ્યાયિત કરો. જો $S=[0, 4]$ તો નીચેના વિધાનો પૈકી કયું સાચું નથી?

Options :

1. $f(g(S)) \neq f(S)$

2. $f(g(S))=S$

3. $g(f(S)) \neq S$

4. $g(f(S)) = g(S)$

Question Number : 62 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If a>0 and $z = \frac{(1+i)^2}{a-i}$, has magnitude

$\sqrt{\frac{2}{5}}$, then $\bar{z}$ is equal to :

Options :

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

2. $-\frac{1}{5} + \frac{3}{5}i$

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

4. $\frac{1}{5} - \frac{3}{5}i$

Question Number : 62 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि a>0 तथा $z = \frac{(1+i)^2}{a-i}$ का परिमाण

(magnitude) $\sqrt{\frac{2}{5}}$ है, तो $\bar{z}$ बराबर है :

Options :

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

2. $-\frac{1}{5} + \frac{3}{5}i$

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

4. $\frac{1}{5} - \frac{3}{5}i$

Question Number : 62 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જો $a>0$ અને $z=\frac{(1+i)^2}{a-i}$ નો માનાંક $\sqrt{\frac{2}{5}}$ હોય,

તો $\bar{z}$ = _____.

Options :

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

2. $-\frac{1}{5}+\frac{3}{5}i$

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

4. $\frac{1}{5}-\frac{3}{5}i$

Question Number : 63 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If α and β are the roots of the quadratic equation, $x^2+x\sin\theta-2\sin\theta=0$, $\theta\in\left(0,\frac{\pi}{2}\right)$,

then $\frac{\alpha^{12}+\beta^{12}}{\left(\alpha^{-12}+\beta^{-12}\right)\cdot(\alpha-\beta)^{24}}$ is equal to :

Options :

1. $\frac{2^6}{(\sin\theta+8)^{12}}$

2. $\frac{2^{12}}{(\sin\theta-8)^6}$

3. $\frac{2^{12}}{(\sin\theta+8)^{12}}$

4. $\frac{2^{12}}{(\sin\theta - 4)^{12}}$

Question Number : 63 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि द्विघाती समीकरण, $x^2 + x\sin\theta - 2\sin\theta = 0$,

$\theta \in \left(0, \frac{\pi}{2}\right)$ के मूल α तथा β हैं, तो

$\frac{\alpha^{12} + \beta^{12}}{\left(\alpha^{-12} + \beta^{-12}\right)\cdot(\alpha - \beta)^{24}}$ बराबर है :

Options :

1. $\frac{2^6}{(\sin\theta + 8)^{12}}$

2. $\frac{2^{12}}{(\sin\theta - 8)^6}$

3. $\frac{2^{12}}{(\sin\theta + 8)^{12}}$

4. $\frac{2^{12}}{(\sin\theta - 4)^{12}}$

Question Number : 63 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જો α અને β દ્વિઘાત સમીકરણ

$x^2 + x\sin\theta - 2\sin\theta = 0$, $\theta \in \left(0, \frac{\pi}{2}\right)$ નાં બીજ હોય,

તો $\frac{\alpha^{12} + \beta^{12}}{\left(\alpha^{-12} + \beta^{-12}\right)\cdot(\alpha - \beta)^{24}} =$ _____.

Options :

1. $\frac{2^6}{(\sin\theta + 8)^{12}}$

2. $\frac{2^{12}}{(\sin\theta - 8)^6}$

3. $\frac{2^{12}}{(\sin\theta + 8)^{12}}$

4. $\frac{2^{12}}{(\sin\theta - 4)^{12}}$

Question Number : 64 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If $\Delta_1 = \begin{vmatrix} x & \sin\theta & \cos\theta \\ -\sin\theta & -x & 1 \\ \cos\theta & 1 & x \end{vmatrix}$ and

$\Delta_2 = \begin{vmatrix} x & \sin 2\theta & \cos 2\theta \\ -\sin 2\theta & -x & 1 \\ \cos 2\theta & 1 & x \end{vmatrix}$, $x \neq 0$; then

for all $\theta \in \left(0, \frac{\pi}{2}\right)$:

Options :

1. $\Delta_1 - \Delta_2 = -2x^3$

2. $\Delta_1 + \Delta_2 = -2x^3$

3. $\Delta_1 + \Delta_2 = -2(x^3 + x - 1)$

4. $\Delta_1 - \Delta_2 = x(\cos 2\theta - \cos 4\theta)$

Question Number : 64 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $\Delta_1=\begin{vmatrix} x & \sin\theta & \cos\theta \\ -\sin\theta & -x & 1 \\ \cos\theta & 1 & x \end{vmatrix}$ तथा

$\Delta_2=\begin{vmatrix} x & \sin 2\theta & \cos 2\theta \\ -\sin 2\theta & -x & 1 \\ \cos 2\theta & 1 & x \end{vmatrix}$, $x \neq 0$; तो सभी

$\theta \in \left(0, \frac{\pi}{2}\right)$ के लिए :

Options :

1. $\Delta_1 - \Delta_2 = -2x^3$

2. $\Delta_1 + \Delta_2 = -2x^3$

3. $\Delta_1 + \Delta_2 = -2(x^3 + x - 1)$

4. $\Delta_1 - \Delta_2 = x(\cos 2\theta - \cos 4\theta)$

Question Number : 64 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જો $\Delta_1=\begin{vmatrix} x & \sin\theta & \cos\theta \\ -\sin\theta & -x & 1 \\ \cos\theta & 1 & x \end{vmatrix}$ અને

$\Delta_2=\begin{vmatrix} x & \sin 2\theta & \cos 2\theta \\ -\sin 2\theta & -x & 1 \\ \cos 2\theta & 1 & x \end{vmatrix}$, $x \neq 0$; તો બધા

$\theta \in \left(0, \frac{\pi}{2}\right)$ માટે :

Options :

1. $\Delta_1 - \Delta_2 = -2x^3$

2. $\Delta_1 + \Delta_2 = -2x^3$

3. $\Delta_1 + \Delta_2 = -2(x^3 + x - 1)$

4. $\Delta_1 - \Delta_2 = x(\cos 2\theta - \cos 4\theta)$

Question Number : 65 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the system of linear equations

$x+y+z=5$

$x+2y+2z=6$

$x+3y+\lambda z=\mu$, $(\lambda,\ \mu \in \mathbf{R})$, has infinitely many solutions, then the value of $\lambda+\mu$ is :

Options :

1. 12

2. 10

3. 9

4. 7

Question Number : 65 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि रैखिक समीकरण निकाय

$x+y+z=5$

$x+2y+2z=6$

$x+3y+\lambda z=\mu$, $(\lambda,\ \mu \in \mathbf{R})$ के अनन्त हल है, तो $\lambda+\mu$ का मान है :

Options :

1. 12

2. 10

3. 9

4. 7

Question Number : 65 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જો સુરેખ સમીકરણ સંહતિ

$x+y+z=5$

$x+2y+2z=6$

$x+3y+\lambda z=\mu$, $(\lambda, \mu \in \mathbf{R})$, ને અનંત ઉકેલો હોય,

તો $\lambda+\mu$ ની કિંમત _____ છે.

Options :

1. 12

2. 10

3. 9

4. 7

Question Number : 66 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The number of 6 digit numbers that can be formed using the digits 0, 1, 2, 5, 7 and 9 which are divisible by 11 and no digit is repeated, is :

Options :

1. 48

2. 60

3. 72

4. 36

Question Number : 66 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अंकों (digits) 0, 1, 2, 5, 7 तथा 9 के प्रयोग से छः अंकों वाली ऐसी संख्याओं, जो 11 से भाज्य हों तथा जिनमें कोई भी अंक दोबारा न आए, की संख्या है :

Options :

1. 48

2. 60

3. 72

4. 36

Question Number : 66 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

પુનરાવર્તન વગર 0, 1, 2, 5, 7, 9 અંકોનો ઉપયોગ કરી 6 અંકોની 11 વડે વિભાજ્ય કેટલી સંખ્યા મળે?

Options :

1. 48

2. 60

3. 72

4. 36

Question Number : 67 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If $a_1, a_2, a_3, \ldots\ldots, a_n$ are in A.P. and $a_1 + a_4 + a_7 + \ldots\ldots + a_{16} = 114$, then $a_1 + a_6 + a_{11} + a_{16}$ is equal to :

Options :

1. 38

2. 64

3. 76

4. 98

Question Number : 67 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $a_1, a_2, a_3, \ldots\ldots, a_n$ एक समान्तर श्रेढ़ी में हैं तथा $a_1 + a_4 + a_7 + \ldots\ldots + a_{16} = 114$ है, तो $a_1 + a_6 + a_{11} + a_{16}$ बराबर है :

Options :

1. 38

2. 64

3. 76

4. 98

Question Number : 67 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જો $a_1, a_2, a_3, \ldots\ldots\ldots, a_n$ સમાંતર શ્રેણીમાં (A.P.) હોય અને $a_1 + a_4 + a_7 + \ldots\ldots\ldots + a_{16} = 114$, તો $a_1 + a_6 + a_{11} + a_{16} =$ _____.

Options :

1. 38

2. 64

3. 76

4. 98

Question Number : 68 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The sum

$$\frac{3 \times 1^3}{1^2} + \frac{5 \times \left(1^3 + 2^3\right)}{1^2 + 2^2} + \frac{7 \times \left(1^3 + 2^3 + 3^3\right)}{1^2 + 2^2 + 3^2} + \ldots\ldots\ldots$$

upto 10^{th} term, is :

Options :

1. 600

2. 620

3. 660

4. 680

Question Number : 68 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$\frac{3\times 1^3}{1^2}+\frac{5\times\left(1^3+2^3\right)}{1^2+2^2}+\frac{7\times\left(1^3+2^3+3^3\right)}{1^2+2^2+3^2}+\ldots\ldots$

के प्रथम दस पदों का योगफल है :

Options :

1. 600

2. 620

3. 660

4. 680

Question Number : 68 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

સરવાળો

$\frac{3\times 1^3}{1^2}+\frac{5\times\left(1^3+2^3\right)}{1^2+2^2}+\frac{7\times\left(1^3+2^3+3^3\right)}{1^2+2^2+3^2}+\ldots\ldots$

(10 પદ સુધી) બરાબર _____.

Options :

1. 600

2. 620

3. 660

4. 680

Question Number : 69 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the coefficients of x^2 and x^3 are both zero, in the expansion of the expression $(1+ax+bx^2)(1-3x)^{15}$ in powers of x, then the ordered pair (a, b) is equal to :

Options :

1. $(-21, 714)$

2. $(-54, 315)$

3. $(28, 861)$

4. (28, 315)

Question Number : 69 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि x की घातों (powers) में, व्यंजक $(1+ax+bx^2)(1-3x)^{15}$ के प्रसार में x^2 तथा x^3 दोनों के गुणांक शून्य के बराबर हैं, तो क्रमित युग्म (a, b) बराबर है :

Options :

1. (−21, 714)

2. (−54, 315)

3. (28, 861)

4. (28, 315)

Question Number : 69 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

x ની ઘાતોમાં, નિરૂપણ $(1+ax+bx^2)(1-3x)^{15}$ ના વિસ્તરણમાં, જો x^2 અને x^3 બન્નેનાં સહગુણકો શૂન્ય હોય, તો ક્રમયુક્ત જોડ (a, b) = _____.

Options :

1. (−21, 714)

2. (−54, 315)

3. (28, 861)

4. (28, 315)

Question Number : 70 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If $\lim\limits_{x\to 1}\dfrac{x^4-1}{x-1}=\lim\limits_{x\to k}\dfrac{x^3-k^3}{x^2-k^2}$, then k is :

Options :

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

2. $\frac{8}{3}$

3. $\frac{3}{8}$

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

Question Number : 70 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $\lim_{x\to 1}\frac{x^4-1}{x-1}=\lim_{x\to k}\frac{x^3-k^3}{x^2-k^2}$, तो k बराबर है :

Options :

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

2. $\frac{8}{3}$

3. $\frac{3}{8}$

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

Question Number : 70 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જો $\lim_{x\to 1}\frac{x^4-1}{x-1}=\lim_{x\to k}\frac{x^3-k^3}{x^2-k^2}$, તો

$k=$_____.

Options :

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

2. $\frac{8}{3}$

3. $\frac{3}{8}$

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

Question Number : 71 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If $f(x)=\begin{cases}\frac{\sin(p+1)x+\sin x}{x}, & x<0\\ q, & x=0\\ \frac{\sqrt{x+x^2}-\sqrt{x}}{x^{3/2}}, & x>0\end{cases}$

is continuous at $x=0$, then the ordered pair (p, q) is equal to :

Options :

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

2. $\left(\frac{5}{2},\frac{1}{2}\right)$

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

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

Question Number : 71 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $f(x)=\begin{cases}\frac{\sin(p+1)x+\sin x}{x} & , \quad x<0 \\ q & , \quad x=0 \\ \frac{\sqrt{x+x^2}-\sqrt{x}}{x^{3/2}} & , \quad x>0\end{cases}$

$x=0$ पर संतत है, तो क्रमित युग्म (p, q) बराबर है :

Options :

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

2. $\left(\frac{5}{2}, \frac{1}{2}\right)$

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

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

Question Number : 71 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જો $f(x)=\begin{cases}\frac{\sin(p+1)x+\sin x}{x} & , \quad x<0 \\ q & , \quad x=0 \\ \frac{\sqrt{x+x^2}-\sqrt{x}}{x^{3/2}} & , \quad x>0\end{cases}$

એ $x=0$ અગળ સતત હોય, તો ક્રમયુક્ત જોડ (p, q)

=_____.

Options :

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

2. $\left(\frac{5}{2}, \frac{1}{2}\right)$

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

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

Question Number : 72 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $f : \mathbf{R} \to \mathbf{R}$ be differentiable at $c \in \mathbf{R}$ and $f(c) = 0$. If $g(x) = |f(x)|$, then at $x = c$, g is :

Options :

1. differentiable if $f'(c) \neq 0$

2. differentiable if $f'(c) = 0$

3. not differentiable if $f'(c) = 0$

4. not differentiable

Question Number : 72 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $f : \mathbf{R} \to \mathbf{R}$, $c \in \mathbf{R}$ पर अवकलनीय है तथा $f(c) = 0$ है। यदि $g(x) = |f(x)|$, तो $x = c$ पर, g :

Options :

1. अवकलनीय है, यदि $f'(c) \neq 0$

2. अवकलनीय है, यदि $f'(c) = 0$

3. अवकलनीय नहीं है, यदि $f'(c) = 0$

4. अवकलनीय नहीं है।

Question Number : 72 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ધારો કે $f : \mathbf{R} \to \mathbf{R}$ એ $c \in \mathbf{R}$ આગળ વિકલનીય હોય અને $f(c) = 0$. જો $g(x) = |f(x)|$, તો $x = c$ આગળ, g એ :

Options :

1. વિકલનીય છે જો $f'(c) \neq 0$

2. વિકલનીય છે જો $f'(c) = 0$

3. વિકલનીય નથી જો $f'(c) = 0$

4. વિકલનીય નથી

Question Number : 73 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let $f(x) = e^x - x$ and $g(x) = x^2 - x, \forall x \in \mathbf{R}$.

Then the set of all $x \in \mathbf{R}$, where the function

$h(x) = (f \circ g)(x)$ is increasing, is :

Options :

1. $\left[\frac{-1}{2}, 0\right] \cup [1, \infty)$

2. $\left[0, \frac{1}{2}\right] \cup [1, \infty)$

3. $\left[-1, \frac{-1}{2}\right] \cup \left[\frac{1}{2}, \infty\right)$

4. $[0, \infty)$

Question Number : 73 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना $f(x) = e^x - x$ तथा $g(x) = x^2 - x, \forall x \in \mathbf{R}$, तो

सभी $x \in \mathbf{R}$, जिनके लिए फलन $h(x) = (f \circ g)(x)$

वर्धमान है, का समुच्चय है :

Options :

1. $\left[\frac{-1}{2}, 0\right] \cup [1, \infty)$

2. $\left[0, \frac{1}{2}\right] \cup [1, \infty)$

3. $\left[-1, \frac{-1}{2}\right] \cup \left[\frac{1}{2}, \infty\right)$

4. $[0, \infty)$

Question Number : 73 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ધારો કે $f(x) = e^x - x$ અને $g(x) = x^2 - x, \forall x \in \mathbf{R}$.
તો $h(x) = (f \circ g)(x)$ જ્યાં વધતુ વિધેય હોય તેવા તમામ
$x \in \mathbf{R}$ નો ગણ _____ છે.

Options :

1. $\left[\frac{-1}{2}, 0\right] \cup [1, \infty)$

2. $\left[0, \frac{1}{2}\right] \cup [1, \infty)$

3. $\left[-1, \frac{-1}{2}\right] \cup \left[\frac{1}{2}, \infty\right)$

4. $[0, \infty)$

Question Number : 74 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If $\int \frac{dx}{\left(x^2-2x+10\right)^2}$

$= A\left(\tan^{-1}\left(\frac{x-1}{3}\right) + \frac{f(x)}{x^2-2x+10}\right) + C$

where C is a constant of integration, then :

Options :

1. $A = \frac{1}{81}$ and $f(x) = 3(x-1)$

2. $A = \frac{1}{27}$ and $f(x) = 9(x-1)$

3. $A=\frac{1}{54}$ and $f(x)=3(x-1)$

4. $A=\frac{1}{54}$ and $f(x)=9(x-1)^2$

Question Number : 74 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $\int\frac{dx}{\left(x^2-2x+10\right)^2}$

$=A\left(\tan^{-1}\left(\frac{x-1}{3}\right)+\frac{f(x)}{x^2-2x+10}\right)+C$

जहाँ C एक समाकलन अचर है, तो :

Options :

1. $A=\frac{1}{81}$ तथा $f(x)=3(x-1)$

2. $A=\frac{1}{27}$ तथा $f(x)=9(x-1)$

3. $A=\frac{1}{54}$ तथा $f(x)=3(x-1)$

4. $A=\frac{1}{54}$ तथा $f(x)=9(x-1)^2$

Question Number : 74 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જો $\int\frac{dx}{\left(x^2-2x+10\right)^2}$

$=A\left(\tan^{-1}\left(\frac{x-1}{3}\right)+\frac{f(x)}{x^2-2x+10}\right)+C$, જ્યાં

C એ સંકલનનો અચળાંક છે, તો :

Options :

1. $A=\frac{1}{81}$ અને $f(x)=3(x-1)$

2. $A=\frac{1}{27}$ અને $f(x)=9(x-1)$

3. $A=\frac{1}{54}$ અને $f(x)=3(x-1)$

4. $A=\frac{1}{54}$ અને $f(x)=9(x-1)^2$

Question Number : 75 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The value of $\int_0^{2\pi}\left[\sin 2x(1+\cos 3x)\right]dx$, where [t] denotes the greatest integer function, is :

Options :

1. 2π

2. -2π

3. π

4. $-\pi$

Question Number : 75 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$\int_0^{2\pi}\left[\sin 2x(1+\cos 3x)\right]dx$ का मान, जहाँ [t] महत्तम पूर्णांक फलन है, है :

Options :

1. 2π

2. -2π

3. π

4. $-\pi$

Question Number : 75 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જો [t] એ મહત્તમ પૂર્ણાંક વિધેય દર્શાવે, તો

$\int_0^{2\pi} [\sin 2x(1+\cos 3x)]\,dx$ ની કિંમત

_____ છે.

Options :

1. 2π

2. -2π

3. π

4. $-\pi$

Question Number : 76 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$$\lim_{n\to\infty}\left(\frac{(n+1)^{1/3}}{n^{4/3}}+\frac{(n+2)^{1/3}}{n^{4/3}}+\cdots\cdots+\frac{(2n)^{1/3}}{n^{4/3}}\right)$$

is equal to :

Options :

1. $\frac{3}{4}(2)^{4/3}-\frac{3}{4}$

2. $\frac{4}{3}(2)^{4/3}$

3. $\frac{3}{4}(2)^{4/3}-\frac{4}{3}$

4. $\frac{4}{3}(2)^{3/4}$

Question Number : 76 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$$\lim_{n\to\infty}\left(\frac{(n+1)^{1/3}}{n^{4/3}}+\frac{(n+2)^{1/3}}{n^{4/3}}+\cdots\cdots+\frac{(2n)^{1/3}}{n^{4/3}}\right)$$

बराबर है :

Options :

1. $\frac{3}{4}(2)^{4/3} - \frac{3}{4}$

2. $\frac{4}{3}(2)^{4/3}$

3. $\frac{3}{4}(2)^{4/3} - \frac{4}{3}$

4. $\frac{4}{3}(2)^{3/4}$

Question Number : 76 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$$\lim_{n\to\infty}\left(\frac{(n+1)^{1/3}}{n^{4/3}} + \frac{(n+2)^{1/3}}{n^{4/3}} + \cdots\cdots + \frac{(2n)^{1/3}}{n^{4/3}}\right)$$

$=$ _____.

Options :

1. $\frac{3}{4}(2)^{4/3} - \frac{3}{4}$

2. $\frac{4}{3}(2)^{4/3}$

3. $\frac{3}{4}(2)^{4/3} - \frac{4}{3}$

4. $\frac{4}{3}(2)^{3/4}$

Question Number : 77 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If $y=y(x)$ is the solution of the differential equation $\frac{dy}{dx}=(\tan x-y)\sec^2 x$,

$x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$, such that $y(0)=0$, then

$y\left(-\frac{\pi}{4}\right)$ is equal to :

Options :

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

2. $e-2$

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

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

Question Number : 77 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि $y=y(x)$, अवकल समीकरण

$\frac{dy}{dx}=(\tan x-y)\sec^2 x, \quad x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$

जबकि $y(0)=0$ का हल है, तो $y\left(-\frac{\pi}{4}\right)$ बराबर है :

Options :

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

2. $e-2$

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

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

Question Number : 77 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જો $y=y(x)$ એ વિકલ સમીકરણ

$\frac{dy}{dx}=(\tan x-y)\sec^2 x, \quad x \in \left(-\frac{\pi}{2}, \frac{\pi}{2}\right)$ નો

ઉકેલ હોય કે જેથી $y(0)=0$, તો $y\left(-\frac{\pi}{4}\right)$

$=$_____.

Options :

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

2. $e-2$

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

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

Question Number : 78 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The region represented by $|x-y| \le 2$ and $|x+y| \le 2$ is bounded by a :

Options :

1. rhombus of side length 2 units

2. rhombus of area $8\sqrt{2}$ sq. units

3. square of side length $2\sqrt{2}$ units

4. square of area 16 sq. units

Question Number : 78 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$|x-y| \le 2$ तथा $|x+y| \le 2$ द्वारा प्रदर्शित क्षेत्र जिसके द्वारा प्रतिबद्ध (bounded) है, वह है :

Options :

1. एक समचतुर्भुज जिसकी भुजा की लम्बाई 2 इकाई है।

2. एक समचतुर्भुज जिसका क्षेत्रफल $8\sqrt{2}$ वर्ग इकाई है।

3. एक वर्ग जिसकी भुजा की लम्बाई $2\sqrt{2}$ इकाई है।

4. एक वर्ग जिसका क्षेत्रफल 16 वर्ग इकाई है।

Question Number : 78 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$|x-y| \le 2$ અને $|x+y| \le 2$ દ્વારા દર્શાવેલ પ્રદેશ નીચેના પૈકી કોના દ્વારા ઘેરાયેલો છે?

Options :

1. બાજુની લંબાઇ 2 એકમ હોય તેવા સમબાજુ ચતુષ્કોણ.

2. $8\sqrt{2}$ ચો. એકમ ક્ષેત્રફળ હોય તેવા સમબાજુ ચતુષ્કોણ.

3. બાજુની લંબાઇ $2\sqrt{2}$ એકમ હોય તેવા ચોરસ.

4. 16 ચો. એકમ ક્ષેત્રફળ હોય તેવા ચોરસ.

Question Number : 79 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the circles $x^2+y^2+5Kx+2y+K=0$ and $2(x^2+y^2)+2Kx+3y-1=0, (K \epsilon \mathbf{R})$, intersect at the points P and Q, then the line $4x+5y-K=0$ passes through P and Q, for :

Options :

1. exactly one value of K

2. exactly two values of K

3. infinitely many values of K

4. no value of K.

Question Number : 79 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि वृत्तों $x^2+y^2+5Kx+2y+K=0$ तथा $2(x^2+y^2)+2Kx+3y-1=0$, $(K\epsilon R)$, के प्रतिच्छेदन बिन्दु P तथा Q हैं, तो रेखा $4x+5y-K=0$ के बिन्दुओं P तथा Q से होकर जाने के लिए :

Options :

1. K का मात्र एक मान है।

2. K के मात्र दो मान हैं।

3. K के अनन्त मान हैं।

4. K का कोई भी मान नहीं है।

Question Number : 79 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જો વર્તુળો $x^2+y^2+5Kx+2y+K=0$ અને $2(x^2+y^2)+2Kx+3y-1=0, (K\epsilon R)$, P અને Q બિંદુઓમાં છેદે, તો રેખા $4x+5y-K=0$, P અને Q માંથી પસાર થાય, તે માટે :

Options :

1. K ની એક જ કિંમત મળે

2. K ની બે જ કિંમતો મળે

3. K ની અનંત કિંમતો મળે

4. K ની એક પણ કિંમત ન મળે

Question Number : 80 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The line $x=y$ touches a circle at the point $(1, 1)$. If the circle also passes through the point $(1, -3)$, then its radius is :

Options :

1. 2

2. 3

3. $2\sqrt{2}$

4. $3\sqrt{2}$

Question Number : 80 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

रेखा $x=y$ एक वृत्त को बिन्दु $(1, 1)$ पर स्पर्श करती है। यदि यह वृत्त बिन्दु $(1, -3)$ से भी होकर जाता है, तो इसकी त्रिज्या है :

Options :

1. 2

2. 3

3. $2\sqrt{2}$

4. $3\sqrt{2}$

Question Number : 80 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

રેખા $x=y$ કોઇ વર્તુળ ને બિંદુ $(1, 1)$ આગળ સ્પર્શે છે. જો આ વર્તુળ $(1, -3)$ બિંદુમાંથી પણ પસાર થતું હોય, તો તેની ત્રિજ્યા _____.

Options :

1. 2

2. 3

3. $2\sqrt{2}$

4. $3\sqrt{2}$

Question Number : 81 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the line $x-2y=12$ is tangent to the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ at the point $\left(3, \frac{-9}{2}\right)$, then the length of the latus rectum of the ellipse is :

Options :

1. 9

2. $8\sqrt{3}$

3. 5

4. $12\sqrt{2}$

Question Number : 81 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि रेखा, $x-2y=12$ दीर्घवृत्त, $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ को बिन्दु $\left(3, \frac{-9}{2}\right)$ पर स्पर्श करती है, तो इसके नाभिलम्ब की लम्बाई है :

Options :

1. 9

2. $8\sqrt{3}$

3. 5

4. $12\sqrt{2}$

Question Number : 81 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જો રેખા $x-2y=12$ એ ઉપવલય $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ ના બિંદુ $\left(3, \frac{-9}{2}\right)$ આગળનો સ્પર્શક હોય, તો આ ઉપવલયના નાભિલંબની લંબાઇ _____ છે.

Options :

1. 9

2. $8\sqrt{3}$

3. 5

4. $12\sqrt{2}$

Question Number : 82 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If a directrix of a hyperbola centred at the origin and passing through the point $\left(4, -2\sqrt{3}\right)$ is $5x=4\sqrt{5}$ and its eccentricity is e, then :

Options :

1. $4e^4-24e^2+27=0$

2. $4e^4-12e^2-27=0$

3. $4e^4+8e^2-35=0$

4. $4e^4-24e^2+35=0$

Question Number : 82 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक अतिपरवलय का केन्द्र मूलबिन्दु पर है तथा यह बिन्दु $\left(4, -2\sqrt{3}\right)$ से होकर जाता है। यदि इसकी एक नियता (directrix) $5x=4\sqrt{5}$ है तथा इसकी उत्केन्द्रता e है, तो :

Options :

1. $4e^4 - 24e^2 + 27 = 0$

2. $4e^4 - 12e^2 - 27 = 0$

3. $4e^4 + 8e^2 - 35 = 0$

4. $4e^4 - 24e^2 + 35 = 0$

Question Number : 82 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જો ઉગમબિંદુ કેન્દ્રવાળા અને $\left(4, -2\sqrt{3}\right)$ બિંદુમાંથી પસાર થતા અતિવલયની નિયામિકા $5x = 4\sqrt{5}$ હોય તથા ઉત્કેન્દ્રતા e હોય, તો :

Options :

1. $4e^4 - 24e^2 + 27 = 0$

2. $4e^4 - 12e^2 - 27 = 0$

3. $4e^4 + 8e^2 - 35 = 0$

4. $4e^4 - 24e^2 + 35 = 0$

Question Number : 83 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let A(3, 0, -1), B(2, 10, 6) and C(1, 2, 1) be the vertices of a triangle and M be the midpoint of AC. If G divides BM in the ratio, 2 : 1, then $\cos(\angle GOA)$ (O being the origin) is equal to :

Options :

1. $\frac{1}{\sqrt{15}}$

2. $\frac{1}{\sqrt{30}}$

3. $\frac{1}{2\sqrt{15}}$

4. $\frac{1}{6\sqrt{10}}$

Question Number : 83 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना एक त्रिभुज के शीर्ष बिन्दु A(3, 0, −1), B(2, 10, 6) तथा C(1, 2, 1) हैं तथा AC का मध्यबिन्दु M है। यदि G, BM को 2 : 1 के अनुपात में विभाजित करता है, तो $\cos(\angle GOA)$ (O मूलबिन्दु है) बराबर है :

Options :

1. $\frac{1}{\sqrt{15}}$

2. $\frac{1}{\sqrt{30}}$

3. $\frac{1}{2\sqrt{15}}$

4. $\frac{1}{6\sqrt{10}}$

Question Number : 83 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ધારો કે A(3, 0, −1), B(2, 10, 6) અને C(1, 2, 1) એ કોઇ ત્રિકોણના શિરોબિંદુઓ છે અને M એ AC નું મધ્યબિંદુ છે. જો G એ BM નું 2 : 1 ગુણોત્તરમાં વિભાજન કરે, તો $\cos(\angle GOA)$ (જ્યાં O ઉગમબિંદુ છે) બરાબર _____ છે.

Options :

1. $\frac{1}{\sqrt{15}}$

2. $\frac{1}{\sqrt{30}}$

3. $\frac{1}{2\sqrt{15}}$

4. $\frac{1}{6\sqrt{10}}$

Question Number : 84 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If Q(0, −1, −3) is the image of the point P in the plane $3x-y+4z=2$ and R is the point (3, −1, −2), then the area (in sq. units) of ΔPQR is :

Options :

1. $\frac{\sqrt{91}}{4}$

2. $2\sqrt{13}$

3. $\frac{\sqrt{65}}{2}$

4. $\frac{\sqrt{91}}{2}$

Question Number : 84 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि बिन्दु P का समतल $3x-y+4z=2$ में प्रतिबिम्ब Q(0, −1, −3) है तथा R (3, −1, −2) एक अन्य बिन्दु है, तो ΔPQR का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

1. $\frac{\sqrt{91}}{4}$

2. $2\sqrt{13}$

3. $\frac{\sqrt{65}}{2}$

4. $\frac{\sqrt{91}}{2}$

Question Number : 84 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જો Q(0, −1, −3) એ સમતલ $3x-y+4z=2$ માં બિંદુ P નું પ્રતિબિંબ હોય અને R એ બિંદુ (3, −1, −2) હોય, તો ΔPQR નું ક્ષેત્રફળ (ચો. એકમ માં) _____ છે.

Options :

1. $\frac{\sqrt{91}}{4}$

2. $2\sqrt{13}$

3. $\frac{\sqrt{65}}{2}$

4. $\frac{\sqrt{91}}{2}$

Question Number : 85 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the length of the perpendicular from the point $(\beta, 0, \beta)$ $(\beta \neq 0)$ to the line, $\frac{x}{1}=\frac{y-1}{0}=\frac{z+1}{-1}$ is $\sqrt{\frac{3}{2}}$, then β is equal to :

Options :

1. -2

2. -1

3. 1

4. 2

Question Number : 85 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि बिंदु $(\beta, 0, \beta)$ $(\beta \neq 0)$ से रेखा $\frac{x}{1} = \frac{y-1}{0} = \frac{z+1}{-1}$ पर खींचे गए लंब की लंबाई $\sqrt{\frac{3}{2}}$ है, तो β बराबर है :

Options :

1. -2

2. -1

3. 1

4. 2

Question Number : 85 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જો બિંદુ $(\beta, 0, \beta)$ $(\beta \neq 0)$ થી રેખા $\frac{x}{1} = \frac{y-1}{0} = \frac{z+1}{-1}$ પરના લંબની લંબાઇ $\sqrt{\frac{3}{2}}$ હોય, તો $\beta =$ _____.

Options :

1. -2

2. -1

3. 1

4. 2

Question Number : 86 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Assume that each born child is equally likely to be a boy or a girl. If two families have two children each, then the conditional probability that all children are girls given that at least two are girls is :

Options :

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

2. $\frac{1}{11}$

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

4. $\frac{1}{17}$

Question Number : 86 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना प्रत्येक जन्म लेने वाले बच्चे का लड़का अथवा लड़की होना समसंभाव्य है। माना दो परिवारों में प्रत्येक में दो बच्चे हैं। यदि यह दिया गया है कि कम से कम दो बच्चे लड़कियां हैं, तो सभी बच्चों के लड़की होने की सप्रतिबंध प्रायिकता है :

Options :

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

2. $\frac{1}{11}$

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

4. $\frac{1}{17}$

Question Number : 86 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ધારો કે પ્રત્યેક જન્મેલ બાળક છોકરો કે છોકરી હોય તેની શક્યતા સરખી છે. જો બે બાળકો ધરાવતા બે કુટુંબોમાં ઓછા માં ઓછી બે છોકરીઓ છે તેમ આપેલ હોય, તો બધા જ બાળકો છોકરીઓ હોય તેની શરતી સંભાવના કેટલી?

Options :

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

2. $\frac{1}{11}$

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

4. $\frac{1}{17}$

Question Number : 87 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If for some $x \in \mathbf{R}$, the frequency distribution of the marks obtained by 20 students in a test is :

Marks	2	3	5	7
Frequency	$(x+1)^2$	$2x-5$	x^2-3x	x

then the mean of the marks is :

Options :

1. 2.5

2. 3.2

3. 3.0

4. 2.8

Question Number : 87 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि किसी $x \in \mathbf{R}$ के लिए, 20 विद्यार्थियों द्वारा एक परीक्षा में प्राप्त अंकों का बारंबारता बंटन है,

अंक	2	3	5	7
बारंबारता	$(x+1)^2$	$2x-5$	x^2-3x	x

तो अंकों का माध्य है :

Options :

1. 2.5

2. 3.2

3. 3.0

4. 2.8

Question Number : 87 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

જો કોઇ $x \in \mathbf{R}$ માટે, 20 વિદ્યાર્થીઓ દ્વારા કોઇ એક પરીક્ષામાં મેળવેલ ગુણનું આવૃત્તિ વિતરણ

ગુણ	2	3	5	7
આવૃત્તિ	$(x+1)^2$	$2x-5$	x^2-3x	x

હોય, તો ગુણનો મધ્યક _____ છે.

Options :

1. 2.5

2. 3.2

3. 3.0

4. 2.8

Question Number : 88 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

All the pairs (x, y) that satisfy the inequality

$$2^{\sqrt{\sin^2 x-2\sin x+5}} \cdot \frac{1}{4^{\sin^2 y}} \leq 1$$ also

satisfy the equation :

Options :

1. $\sin x = 2\sin y$

2. $2\sin x = \sin y$

3. $\sin x = |\sin y|$

4. $2|\sin x| = 3\sin y$

Question Number : 88 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

वह सभी युग्म (x, y) जो असमिका $2^{\sqrt{\sin^2 x - 2\sin x + 5}} \cdot \frac{1}{4^{\sin^2 y}} \leq 1$ को संतुष्ट करते हैं, निम्न में से किस समीकरण को भी संतुष्ट करते हैं?

Options :

1. $\sin x = 2\sin y$

2. $2\sin x = \sin y$

3. $\sin x = |\sin y|$

4. $2|\sin x| = 3\sin y$

Question Number : 88 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

તમામ જોડો (x, y) કે જે અસમતા $2^{\sqrt{\sin^2 x - 2\sin x + 5}} \cdot \frac{1}{4^{\sin^2 y}} \leq 1$ નું સમાધાન કરતી હોય, તે _____ સમીકરણનું પણ સમાધાન કરશે.

Options :

1. $\sin x = 2\sin y$

2. $2\sin x = \sin y$

3. $\sin x = |\sin y|$

4. $2|\sin x| = 3\sin y$

Question Number : 89 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ABC is a triangular park with AB = AC = 100 metres. A vertical tower is situated at the mid-point of BC. If the angles of elevation of the top of the tower at A and B are $\cot^{-1}\left(3\sqrt{2}\right)$ and $\operatorname{cosec}^{-1}\left(2\sqrt{2}\right)$ respectively, then the height of the tower (in metres) is :

Options :

1. $\frac{100}{3\sqrt{3}}$

2. 25

3. 20

4. $10\sqrt{5}$

Question Number : 89 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ABC एक त्रिभुजाकार पार्क है जिसमें AB = AC = 100 मीटर है। BC के मध्य बिंदु पर एक सीधी मीनार खड़ी है। यदि मीनार के शिखर के बिंदुओं A तथा B पर उन्नयन कोण क्रमश: $\cot^{-1}\left(3\sqrt{2}\right)$ तथा $\operatorname{cosec}^{-1}\left(2\sqrt{2}\right)$ हैं, तो मीनार की ऊँचाई (मीटरों में) है :

Options :

1. $\frac{100}{3\sqrt{3}}$

2. 25

3. 20

4. $10\sqrt{5}$

Question Number : 89 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ABC એ ત્રિકોણીય પાર્ક છે જેમાં AB = AC = 100 મીટર BC ના મધ્યબિંદુએ એક શિરોલંબ ટાવર આવેલ છે. જો આ ટાવરની ટોચના, A અને B આગળના ઉત્સેધકોણો અનુક્રમે $\cot^{-1}\left(3\sqrt{2}\right)$ અને $\text{cosec}^{-1}\left(2\sqrt{2}\right)$ હોય, તો આ ટાવર ની ઊંચાઇ (મીટર માં) _____ છે.

Options :

1. $\frac{100}{3\sqrt{3}}$

2. 25

3. 20

4. $10\sqrt{5}$

Question Number : 90 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Which one of the following Boolean expressions is a tautology ?

Options :

1. $(p \vee q) \wedge (\sim p \vee \sim q)$

2. $(p \wedge q) \vee (p \wedge \sim q)$

3. $(p \vee q) \wedge (p \vee \sim q)$

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

Question Number : 90 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

बूले के निम्न व्यंजकों में से कौन सा एक, एक पुनरुक्ति है?

Options :

1. $(p \vee q) \wedge (\sim p \vee \sim q)$

2. $(p \wedge q) \vee (p \wedge \sim q)$

3. $(p \vee q) \wedge (p \vee \sim q)$

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

Question Number : 90 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

નીચેનાં પૈકી ક્યું બુલીયન નિરૂપણ નિત્યસત્ય છે?

Options :

1. $(p \vee q) \wedge (\sim p \vee \sim q)$

2. $(p \wedge q) \vee (p \wedge \sim q)$

3. $(p \vee q) \wedge (p \vee \sim q)$

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