National Testing Agency

Question Paper Name:	Paper I EH 12th April 2019 Shift 1 S2
Subject Name:	Paper I EH
Creation Date:	2019-04-12 14:09:35
Duration:	180
Total Marks:	360
Display Marks:	Yes
Share Answer Key With Delivery Engine:	Yes
Actual Answer Key:	Yes

Paper I

Group Number :	1
Group Id :	416529176
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 :	416529322
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:	416529462
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 41652914856 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 combinations has the dimension of electrical resistance (ϵ_0 is the permittivity of vacuum and μ_0 is the permeability of vacuum) ?

Options :

41652958202. $\frac{\mu_0}{\epsilon_0}$

41652958203. $\frac{\epsilon_0}{\mu_0}$

41652958204. $\sqrt{\frac{\mu_0}{\epsilon_0}}$

41652958205. $\sqrt{\frac{\epsilon_0}{\mu_0}}$

Question Number : 1 Question Id : 41652914856 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नांकित में से किस संयोजन की विमा वही है, जो, विद्युत प्रतिरोध की है (यहाँ, ϵ_0, निर्वात की विद्युतशीलता (परावैद्युतांक) तथा μ_0, निर्वात की चुम्बकशीलता है) ?

Options :

41652958202. $\frac{\mu_0}{\epsilon_0}$

41652958203. $\frac{\epsilon_0}{\mu_0}$

41652958204. $\sqrt{\frac{\mu_0}{\epsilon_0}}$

41652958205. $\sqrt{\frac{\epsilon_0}{\mu_0}}$

Question Number : 2 Question Id : 41652914857 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 trajectory of a projectile near the surface of the earth is given as $y = 2x - 9x^2$. If it were launched at an angle θ_0 with speed v_0 then ($g = 10\ ms^{-2}$) :

Options :

41652958206. $\theta_0 = \sin^{-1}\left(\frac{1}{\sqrt{5}}\right)$ and $v_0 = \frac{5}{3}\ \text{ms}^{-1}$

41652958207. $\theta_0 = \cos^{-1}\left(\frac{1}{\sqrt{5}}\right)$ and $v_0 = \frac{5}{3}\ \text{ms}^{-1}$

41652958208. $\theta_0 = \sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$ and $v_0 = \frac{3}{5}\ \text{ms}^{-1}$

41652958209. $\theta_0 = \cos^{-1}\left(\frac{2}{\sqrt{5}}\right)$ and $v_0 = \frac{3}{5}\ \text{ms}^{-1}$

Question Number : 2 Question Id : 41652914857 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

किसी प्रक्षेप्य के प्रक्षेप-पथ को, भू पृष्ठ पर $y = 2x - 9x^2$, से निरूपित किया जाता है। यदि, इसे v_0 चाल द्वारा θ_0 कोण पर प्रमोचित किया गया होता तो, $(g = 10\ \text{ms}^{-2})$:

Options :

41652958206. $\theta_0 = \sin^{-1}\left(\frac{1}{\sqrt{5}}\right)$ तथा $v_0 = \frac{5}{3}\ \text{ms}^{-1}$

41652958207. $\theta_0 = \cos^{-1}\left(\frac{1}{\sqrt{5}}\right)$ तथा $v_0 = \frac{5}{3}\ \text{ms}^{-1}$

41652958208. $\theta_0 = \sin^{-1}\left(\frac{2}{\sqrt{5}}\right)$ तथा $v_0 = \frac{3}{5}\ \text{ms}^{-1}$

41652958209. $\theta_0 = \cos^{-1}\left(\frac{2}{\sqrt{5}}\right)$ तथा $v_0 = \frac{3}{5}\ \text{ms}^{-1}$

Question Number : 3 Question Id : 41652914858 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 man (mass = 50 kg) and his son (mass = 20 kg) are standing on a frictionless surface facing each other. The man pushes his son so that he starts moving at a speed of 0.70 ms^{-1} with respect to the man. The speed of the man with respect to the surface is :

Options :

41652958210. $0.20\ ms^{-1}$

41652958211. $0.28\ ms^{-1}$

41652958212. $0.47\ ms^{-1}$

41652958213. $0.14\ ms^{-1}$

Question Number : 3 Question Id : 41652914858 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 व्यक्ति (द्रव्यमान = 50 kg) तथा उसका बेटा (द्रव्यमान = 20 kg), किसी घर्षणरहित पृष्ठ पर, एक दूसरे के सामने खड़े हैं। वह व्यक्ति अपने बेटे को धकेलता है। जिससे, वह, उस व्यक्ति के सापेक्ष $0.70\ ms^{-1}$ की चाल से गति करने लगता है। तो, उस व्यक्ति की पृष्ठ के सापेक्ष चाल होगी :

Options :

41652958210. $0.20\ ms^{-1}$

41652958211. $0.28\ ms^{-1}$

41652958212. $0.47\ ms^{-1}$

41652958213. $0.14\ ms^{-1}$

Question Number : 4 Question Id : 41652914859 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 person of mass M is, sitting on a swing of length L and swinging with an angular amplitude θ_0. If the person stands up when the swing passes through its lowest point, the work done by him, assuming that his centre of mass moves by a distance l (l<<L), is close to :

Options :

41652958214. Mgl

41652958215. $Mgl\ (1-\theta_0^2)$

41652958216. $Mgl\left(1+\frac{{\theta_0}^2}{2}\right)$

41652958217. $Mgl\ (1+{\theta_0}^2)$

Question Number : 4 Question Id : 41652914859 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 व्यक्ति (द्रव्यमान = M), L लम्बाई के एक झूले पर झूल रहा है। झूले का कोणीय आयाम θ_0 है। झूले के अपने निम्नतम बिन्दु से गुजरते समय, वह व्यक्ति झूले पर खड़ा हो जाता है। यदि खड़े होने से उस व्यक्ति का द्रव्यमान केन्द्र $l (l<<L)$ दूरी से विस्थापित हो जाता है, तो, व्यक्ति द्वारा किया गया कार्य होगा :

Options :

41652958214. Mgl

41652958215. $Mgl\ (1-{\theta_0}^2)$

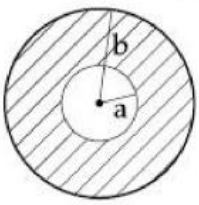
41652958216. $Mgl\left(1+\frac{{\theta_0}^2}{2}\right)$

41652958217. $Mgl\ (1+{\theta_0}^2)$

Question Number : 5 Question Id : 41652914860 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 circular disc of radius b has a hole of radius a at its centre (see figure). If the mass per unit area of the disc varies as $\left(\frac{\sigma_0}{r}\right)$, then the radius of gyration of the disc about its axis passing through the centre is :



Options :

41652958218. $\frac{a+b}{2}$

41652958219. $\sqrt{\frac{a^2+b^2+ab}{2}}$

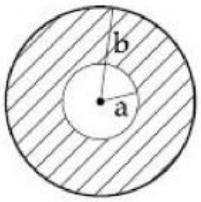
41652958220. $\frac{a+b}{3}$

41652958221. $\sqrt{\frac{a^2+b^2+ab}{3}}$

Question Number : 5 Question Id : 41652914860 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

किसी वृत्ताकार डिस्क की त्रिज्या b है। इसमें एक छिद्र इसके केन्द्र पर बना है, जिसकी त्रिज्या a है, चित्र देखिए। यदि डिस्क के प्रति-एकांक-क्षेत्रफल का द्रव्यमान, $\left(\frac{\sigma_0}{r}\right)$ के अनुसार परिवर्तित होता है तो, इसके केन्द्र से गुजरने वाली अक्ष के परित:, डिस्क की परिभ्रमण त्रिज्या होगी :



Options :

41652958218. $\frac{a+b}{2}$

41652958219. $\sqrt{\frac{a^2+b^2+ab}{2}}$

41652958220. $\frac{a+b}{3}$

41652958221. $\sqrt{\frac{a^2+b^2+ab}{3}}$

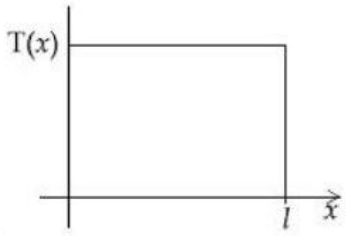
Question Number : 6 Question Id : 41652914861 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

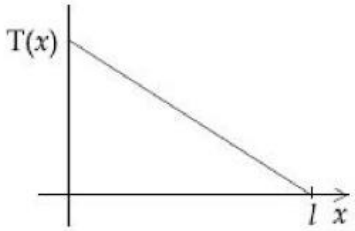
A uniform rod of length l is being rotated in a horizontal plane with a constant angular speed about an axis passing through one of its ends. If the tension generated in the rod due to rotation is $T(x)$ at a distance x from the axis, then which of the following graphs depicts it most closely ?

Options :

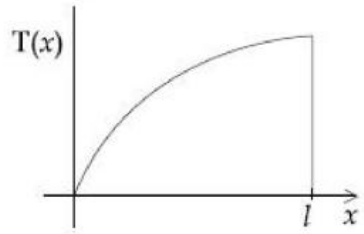
41652958222.



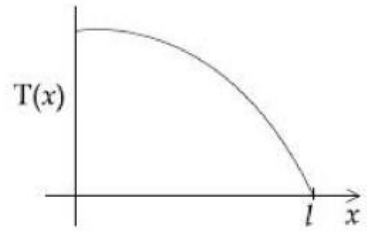
41652958223.



41652958224.



41652958225.



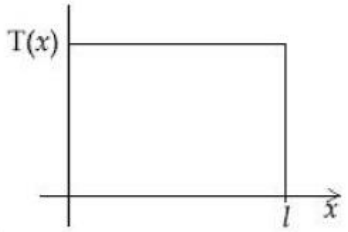
Question Number : 6 Question Id : 41652914861 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

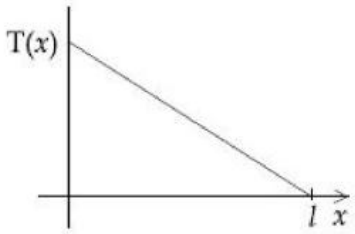
l लम्बाई की, किसी एकसमान छड़ को, क्षैतिज समतल में, एक स्थिर कोणीय चाल से घुमाया जा रहा है। घूर्णन-अक्ष छड़ के एक सिरे से गुजरती है। यदि, इस घूर्णन के कारण, छड़ में उत्पन्न तनाव, अक्ष से x दूरी पर $T(x)$ है तो, निम्नांकित में से कौन सा ग्राफ इसे सर्वाधिक निकट रूप से दर्शाता है?

Options :

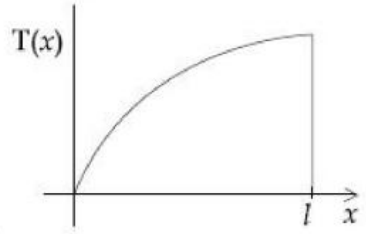
41652958222.



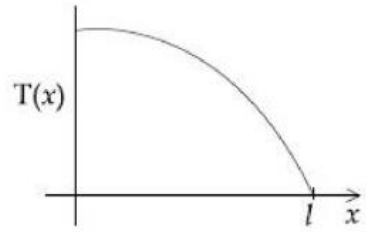
41652958223.



41652958224.



41652958225.



Question Number : 7 Question Id : 41652914862 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 shell is fired from a fixed artillery gun with an initial speed u such that it hits the target on the ground at a distance R from it. If t_1 and t_2 are the values of the time taken by it to hit the target in two possible ways, the product t_1t_2 is :

Options :

41652958226. $R/2g$

41652958227. R/g

41652958228. $2R/g$

41652958229. $R/4g$

Question Number : 7 Question Id : 41652914862 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

किसी स्थिर तोप से एक गोला, प्रारंभिक चाल u से ऐसे कोण पर, दागा जाता है कि गोला भूतल पर अपने लक्ष्य पर लगता है। लक्ष्य की तोप से दूरी R है। यदि गोले द्वारा लक्ष्य पर लगने के दो संभव मार्ग हैं, और इन में लगे समय क्रमशः t_1 तथा t_2 हैं तो, गुणनफल t_1t_2 होगा :

Options :

41652958226. $R/2g$

41652958227. R/g

41652958228. $2R/g$

41652958229. $R/4g$

Question Number : 8 Question Id : 41652914863 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 40°C, a brass wire of 1 mm radius is hung from the ceiling. A small mass, M is hung from the free end of the wire. When the wire is cooled down from 40°C to 20°C it regains its original length of 0.2 m. The value of M is close to :

(Coefficient of linear expansion and Young's modulus of brass are 10^{-5}/°C and 10^{11} N/m^2, respectively ; g = 10 ms^{-2})

Options :

41652958230. 9 kg

41652958231. 1.5 kg

41652958232. $0.9\ \text{kg}$

41652958233. $0.5\ \text{kg}$

Question Number : 8 Question Id : 41652914863 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

40°C तापमान पर 1 mm त्रिज्या का पीतल का एक तार छत से लटकाया गया है। तार के मुक्त सिरे से M द्रव्यमान के एक छोटे पिण्ड को लटकाया गया है। जब तार को 40°C से 20°C पर ठंडा करते हैं तो वह वापस अपनी पुरानी लंबाई 0.2 m को प्राप्त कर लेता है। M का निकटतम मान होगा :

(पीतल का रेखीय प्रसार गुणांक तथा यंग प्रत्यास्था गुणांक क्रमश: हैं $10^{-5}/°C$ तथा $10^{11}\ N/m^2$, एवं $g = 10\ ms^{-2}$)

Options :

41652958230. $9\ \text{kg}$

41652958231. $1.5\ \text{kg}$

41652958232. $0.9\ \text{kg}$

41652958233. $0.5\ \text{kg}$

Question Number : 9 Question Id : 41652914864 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

When M_1 gram of ice at $-10°C$ (specific heat = 0.5 cal $g^{-1}°C^{-1}$) is added to M_2 gram of water at 50°C, finally no ice is left and the water is at 0°C. The value of latent heat of ice, in cal g^{-1} is :

Options :

41652958234. $\frac{5M_1}{M_2} - 50$

41652958235. $\frac{50M_2}{M_1}$

41652958236. $\frac{5M_2}{M_1} - 5$

41652958237. $\frac{50M_2}{M_1} - 5$

Question Number : 9 Question Id : 41652914864 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$-10°C$ तापमान के M_1 ग्राम बर्फ (विशिष्ट ऊष्मा $= 0.5$ cal $g^{-1}°C^{-1}$) को, $50°C$ तापमान के M_2 ग्राम जल में डालने पर, पूरी बर्फ पिघल जाती है और जल का तापमान $0°C$ हो जाता है, तो बर्फ की गुप्त ऊष्मा का मान cal g^{-1} में है :

Options :

41652958234. $\frac{5M_1}{M_2} - 50$

41652958235. $\frac{50M_2}{M_1}$

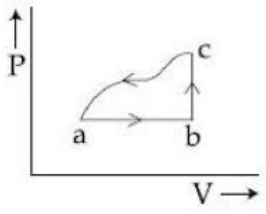
41652958236. $\frac{5M_2}{M_1} - 5$

41652958237. $\frac{50M_2}{M_1} - 5$

Question Number : 10 Question Id : 41652914865 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 sample of an ideal gas is taken through the cyclic process abca as shown in the figure. The change in the internal energy of the gas along the path ca is -180 J. The gas absorbs 250 J of heat along the path ab and 60 J along the path bc. The work done by the gas along the path abc is :



Options :

41652958238. 100 J

41652958239. 120 J

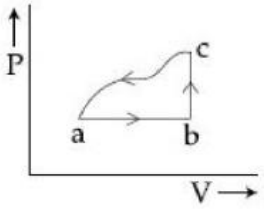
41652958240. 130 J

41652958241. 140 J

Question Number : 10 Question Id : 41652914865 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 आदर्श गैस को, चित्र में दर्शाये गये अनुसार चक्रीय प्रक्रम abca से गुजारा जाता है। ca पथ के अनुदिश गैस की आन्तरिक ऊर्जा में परिवर्तन -180 J है। ab पथ के अनुदिश, गैस 250 J ऊष्मा अवशोषित करती है तथा bc पथ के अनुदिश, गैस 60 J ऊष्मा अवशोषित करती है तो, पथ abc के अनुदिश, गैस द्वारा किया गया कार्य है :



Options :

41652958238. 100 J

41652958239. 120 J

41652958240. 130 J

41652958241. 140 J

Question Number : 11 Question Id : 41652914866 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 moles of helium gas is mixed with three moles of hydrogen molecules (taken to be rigid). What is the molar specific heat of mixture at constant volume ?
(R = 8.3 J/mol K)

Options :

41652958242. 15.7 J/mol K

41652958243. 17.4 J/mol K

41652958244. 19.7 J/mol K

41652958245. 21.6 J/mol K

Question Number : 11 Question Id : 41652914866 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

हीलियम गैस के दो मोल को, हाइड्रोजन के तीन मोल अणुओं (जो कि दृढ़ माने गये हैं) के साथ मिलाया जाता है। स्थिर आयतन पर इस मिश्रण की मोलर विशिष्ट ऊष्मा क्या होगी? (R = 8.3 J/mol K)

Options :

41652958242. 15.7 J/mol K

41652958243. 17.4 J/mol K

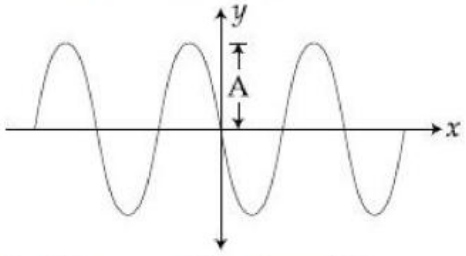
41652958244. 19.7 J/mol K

41652958245. 21.6 J/mol K

Question Number : 12 Question Id : 41652914867 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 progressive wave travelling along the positive x-direction is represented by $y(x,t) = A\sin(kx - \omega t + \phi)$. Its snapshot at $t = 0$ is given in the figure.



For this wave, the phase ϕ is :

Options :

41652958246. 0

41652958247. $-\frac{\pi}{2}$

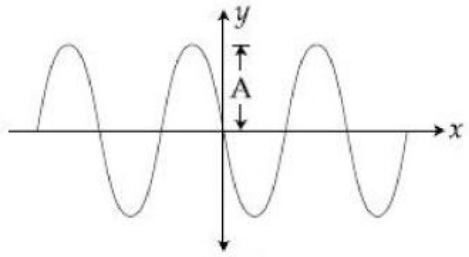
41652958248. $\frac{\pi}{2}$

41652958249. π

Question Number : 12 Question Id : 41652914867 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

धनात्मक x-दिशा में गमन करती हुई किसी प्रगामी तरंग को, $y(x,t) = A\sin(kx - \omega t + \phi)$, से निरूपित किया जाता है। $t = 0$ पर खींचा गया आशु चित्र निम्न से दिया जाता है :



इस तरंग के लिए, कला ϕ का मान होगा :

Options :

41652958246. 0

41652958247. $-\frac{\pi}{2}$

41652958248. $\frac{\pi}{2}$

41652958249. π

Question Number : 13 Question Id : 41652914868 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 submarine (A) travelling at 18 km/hr is being chased along the line of its velocity by another submarine (B) travelling at 27 km/hr. B sends a sonar signal of 500 Hz to detect A and receives a reflected sound of frequency ν. The value of ν is close to :
(Speed of sound in water $= 1500\ ms^{-1}$)

Options :

41652958250. 502 Hz

41652958251. 499 Hz

41652958252. 504 Hz

41652958253. 507 Hz

Question Number : 13 Question Id : 41652914868 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

18 km/hr की चाल से गतिशील एक पनडुब्बी (A) का पीछा, उसकी गति के अनुदिश 27 km/hr की चाल से गतिशील दूसरी पनडुब्बी (B), करती है। A को खोजने के लिए, B 500 Hz का एक ध्वनि सिग्नल भेजती है तो, आवृत्ति ν की परावर्तित ध्वनि प्राप्त होती है। ν का मान होगा, लगभग

(पानी में ध्वनि की चाल $= 1500\ ms^{-1}$)

Options :

41652958250. 502 Hz

41652958251. 499 Hz

41652958252. 504 Hz

41652958253. 507 Hz

Question Number : 14 Question Id : 41652914869 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 point dipole $\vec{p} = -p_0 \hat{x}$ is kept at the origin. The potential and electric field due to this dipole on the y-axis at a distance d are, respectively : (Take V = 0 at infinity)

Options :

41652958254. $0, \frac{\vec{p}}{4\pi\epsilon_0 d^3}$

41652958255. $\frac{|\vec{p}|}{4\pi\epsilon_0 d^2}, \frac{-\vec{p}}{4\pi\epsilon_0 d^3}$

41652958256. $0, \frac{-\vec{p}}{4\pi\epsilon_0 d^3}$

41652958257. $\frac{|\vec{p}|}{4\pi\epsilon_0 d^2}, \frac{\vec{p}}{4\pi\epsilon_0 d^3}$

Question Number : 14 Question Id : 41652914869 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 बिन्दु द्वि-ध्रुव $\vec{p} = -p_0 \hat{x}$, मूल बिन्दु पर स्थित है। तो, इस द्विध्रुव के कारण, y-अक्ष पर d दूरी पर, विभव तथा विद्युत क्षेत्र होंगे क्रमशः (मानो अनंत पर $V=0$ है)

Options :

41652958254. $0, \frac{\vec{p}}{4\pi\epsilon_0 d^3}$

41652958255. $\frac{|\vec{p}|}{4\pi\epsilon_0 d^2}, \frac{-\vec{p}}{4\pi\epsilon_0 d^3}$

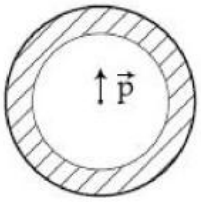
41652958256. $0, \frac{-\vec{p}}{4\pi\epsilon_0 d^3}$

41652958257. $\frac{|\vec{p}|}{4\pi\epsilon_0 d^2}, \frac{\vec{p}}{4\pi\epsilon_0 d^3}$

Question Number : 15 Question Id : 41652914870 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Shown in the figure is a shell made of a conductor. It has inner radius a and outer radius b, and carries charge Q. At its centre is a dipole $\vec{P}$ as shown. In this case :



Options :

41652958258. surface charge density on the inner surface of the shell is zero everywhere

41652958259. surface charge density on the outer surface depends on $\left|\vec{P}\right|$

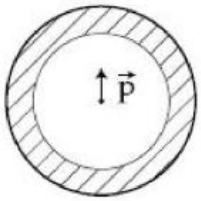
41652958260. surface charge density on the inner surface is uniform and equal to $\frac{(Q/2)}{4\pi a^2}$

41652958261. electric field outside the shell is the same as that of a point charge at the centre of the shell

Question Number : 15 Question Id : 41652914870 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यहाँ आरेख में एक चालक-कोश (शेल) को दर्शाया गया है। इसकी आन्तरिक व बाह्य त्रिज्यायें क्रमशः a तथा b हैं। इस कोश पर Q आवेश है। इसके केन्द्र पर एक द्विध्रुव $\vec{P}$ है (आरेख देखिये)। इस स्थिति में :



Options :

41652958258. कोश के आंतरिक पृष्ठ पर पृष्ठ-आवेश-घनत्व शून्य होगा।

इसके बाह्य पृष्ठ पर पृष्ठ-आवेश घनत्व $\left|\vec{p}\right|$ पर निर्भर होगा।

41652958259.

इसके आन्तरिक पृष्ठ पर पृष्ठ-आवेश घनत्व, एकसमान तथा $\frac{(Q/2)}{4\pi a^2}$ के बराबर है।

41652958260.

कोश के बाहर विद्युत क्षेत्र का मान वही होगा, जो, इसके केन्द्र पर स्थित किसी बिन्दु आवेश के कारण होता है।

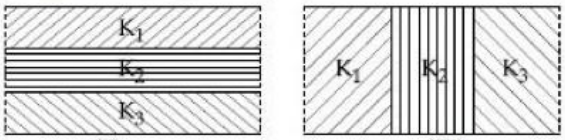
41652958261.

Question Number : 16 Question Id : 41652914871 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 identical parallel plate capacitors, of capacitance C each, have plates of area A, separated by a distance d. The space between the plates of the two capacitors, is filled with three dielectrics, of equal thickness and dielectric constants K_1, K_2 and K_3. The first capacitor is filled as shown in fig. I, and the second one is filled as shown in fig II.

If these two modified capacitors are charged by the same potential V, the ratio of the energy stored in the two, would be (E_1 refers to capacitor (I) and E_2 to capacitor (II)) :



(I) (II)

Options :

$\frac{E_1}{E_2}=\frac{9K_1K_2K_3}{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}$

41652958262.

$\frac{E_1}{E_2}=\frac{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}{9K_1K_2K_3}$

41652958263.

$\frac{E_1}{E_2}=\frac{K_1K_2K_3}{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}$

41652958264.

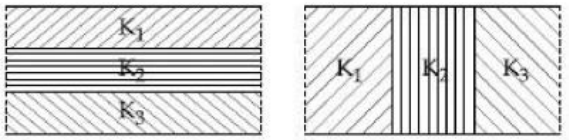
41652958265. $\frac{E_1}{E_2}=\frac{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}{K_1K_2K_3}$

Question Number : 16 Question Id : 41652914871 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 सर्वसम समान्तर पट्टिका संधारित्रों में, प्रत्येक की, धारिता C है, उनकी प्लेटों (पट्टिकाओं) का क्षेत्रफल A है और पट्टिकाओं के बीच की दूरी d है। दोनों प्लेटों के बीच के स्थान को K_1, K_2 तथा K_3 परावैद्युतांक के तीन परावैद्युत स्लैब से भर दिया है। सभी स्लैबों की मोटाई समान है। किन्तु, पहले संधारित्र में उन्हें, आरेख I के अनुसार तथा दूसरे में आरेख II के अनुसार रखा गया है। (E_1 तथा E_2 क्रमशः प्रथम तथा द्वितीय संधारित्र से सम्बन्धित है)

यदि इन नये संधारित्रों में प्रत्येक को समान विभव V से आवेशित किया जाये तो, उनमें संचित ऊर्जाओं का अनुपात होगा :



(I) (II)

Options :

41652958262. $\frac{E_1}{E_2}=\frac{9K_1K_2K_3}{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}$

41652958263. $\frac{E_1}{E_2}=\frac{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}{9K_1K_2K_3}$

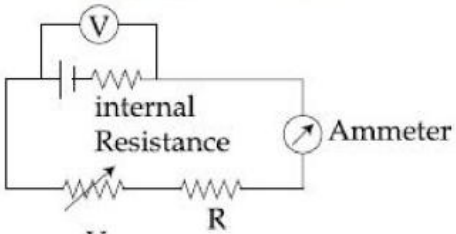
41652958264. $\frac{E_1}{E_2}=\frac{K_1K_2K_3}{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}$

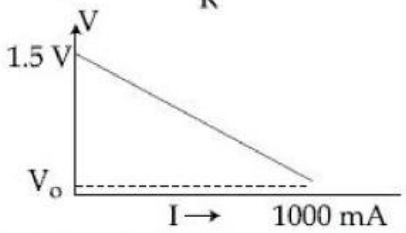
41652958265. $\frac{E_1}{E_2}=\frac{(K_1+K_2+K_3)(K_2K_3+K_3K_1+K_1K_2)}{K_1K_2K_3}$

Question Number : 17 Question Id : 41652914872 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

To verify Ohm's law, a student connects the voltmeter across the battery as, shown in the figure. The measured voltage is plotted as a function of the current, and the following graph is obtained :





If V_o is almost zero, identify the correct statement :

Options :

41652958266. The value of the resistance R is 1.5 Ω

41652958267. The emf of the battery is 1.5 V and its internal resistance is 1.5 Ω

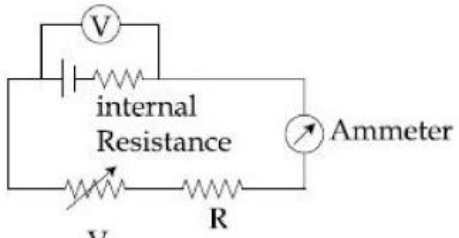
41652958268. The potential difference across the battery is 1.5 V when it sends a current of 1000 mA

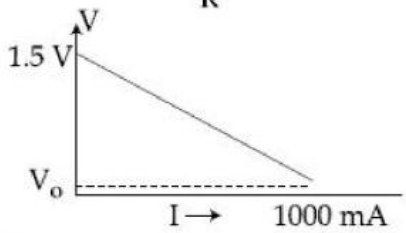
41652958269. The emf of the battery is 1.5 V and the value of R is 1.5 Ω

Question Number : 17 Question Id : 41652914872 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ओम के नियम का सत्यापन करने के लिये, एक छात्रा वोल्टमीटर को एक बैटरी के सिरों के बीच जोड़ती है, और परिपथ में वोल्टता (V) तथा विद्युत धारा (I) के विभिन्न मान प्राप्त कर, निम्नांकित ग्राफ बनाती है।





यदि V_o का मान लगभग शून्य है तो, सही कथन का चयन कीजिए :

Options :

41652958266. दिये गये प्रतिरोधक R का प्रतिरोध 1.5 Ω

41652958267. बैटरी का ई.एम.एफ. = 1.5 V और इसका आन्तरिक प्रतिरोध = 1.5 Ω

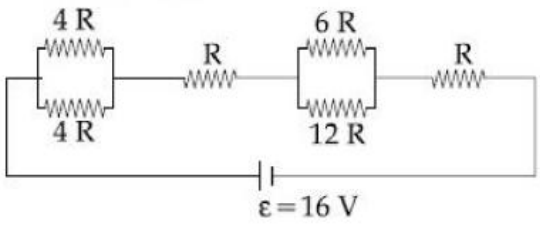
41652958268. बैटरी के सिरों के बीच विभवान्तर = 1.5 V, जब यह 1000 mA धारा प्रवाहित करती है।

41652958269. बैटरी का ई.एम.एफ. 1.5 V तथा R का मान 1.5 Ω है।

Question Number : 18 Question Id : 41652914873 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 resistive network shown below is connected to a D.C. source of 16 V. The power consumed by the network is 4 Watt. The value of R is :



Options :

41652958270. $6\,\Omega$

41652958271. $8\,\Omega$

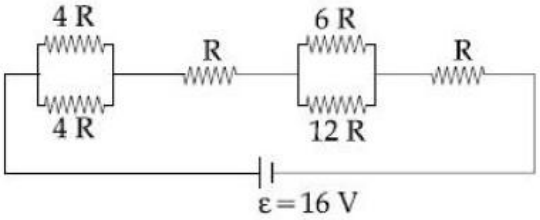
41652958272. $1\,\Omega$

41652958273. $16\,\Omega$

Question Number : 18 Question Id : 41652914873 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दर्शाये गये प्रतिरोधकों के परिपथ को, 16 V के एक डी.सी.(D.C.) स्रोत से जोड़ा गया है। परिपथ द्वारा उपभुक्त शक्ति 4 वॉट है तो, R का मान होगा :



Options :

41652958270. $6\,\Omega$

41652958271. $8\,\Omega$

41652958272. $1\,\Omega$

41652958273. $16\,\Omega$

Question Number : 19 Question Id : 41652914874 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 ring of 10 cm radius carries a uniformly distributed charge. The ring rotates at a constant angular speed of $40\,\pi$ rad s^{-1} about its axis, perpendicular to its plane. If the magnetic field at its centre is 3.8×10^{-9} T, then the charge carried by the ring is close to ($\mu_0 = 4\pi \times 10^{-7}$ N/A^2).

Options :

41652958274. 4×10^{-5} C

41652958275. 2×10^{-6} C

41652958276. $7\times10^{-6}\,C$

41652958277. $3\times10^{-5}\,C$

Question Number : 19 Question Id : 41652914874 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

10 cm त्रिज्या की एक रिंग पर आवेश एकसमान रूप से वितरित है। यह रिंग, $40\,\pi\,rad\,s^{-1}$ की एकसमान दर से अपने अक्ष के परित: घूर्णन कर रही है। जो रिंग के समतल के लम्बवत् है। यदि इसके केन्द्र पर चुम्बकीय क्षेत्र 3.8×10^{-9} T है तो, रिंग पर आवेश लगभग होगा : $(\mu_0=4\pi\times10^{-7}\,N/A^2)$.

Options :

41652958274. $4\times10^{-5}\,C$

41652958275. $2\times10^{-6}\,C$

41652958276. $7\times10^{-6}\,C$

41652958277. $3\times10^{-5}\,C$

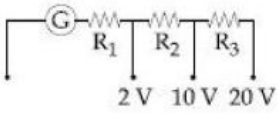
Question Number : 20 Question Id : 41652914875 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A galvanometer of resistance 100 Ω has 50 divisions on its scale and has sensitivity of 20 μA/division. It is to be converted to a voltmeter with three ranges, of 0-2V, 0-10 V and 0-20 V. The appropriate circuit to do so is :

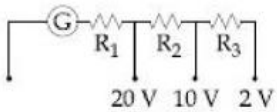
Options :

41652958278.



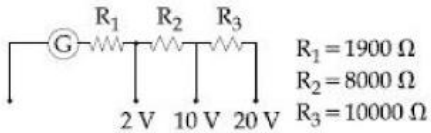
$R_1=1900\,\Omega$
$R_2=9900\,\Omega$
$R_3=19900\,\Omega$

41652958279.

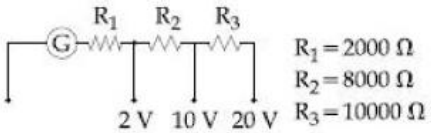


$R_1=19900\,\Omega$
$R_2=9900\,\Omega$
$R_3=1900\,\Omega$

41652958280.



41652958281.



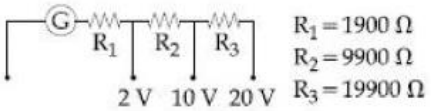
Question Number : 20 Question Id : 41652914875 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

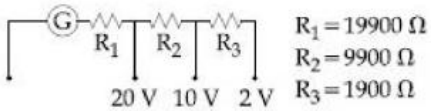
किसी गैल्वेनोमीटर का प्रतिरोध 100 Ω है। इसके स्केल पर 50 भाग है और इसकी सुग्राहिता 20 μA/ भाग है। इसे एक ऐसे वोल्टमीटर में परिवर्तित करना है, जिसके तीन परास 0-2V, 0-10 V तथा 0-20 V हैं। इसके लिए लगभग उपयुक्त परिपथ होगा :

Options :

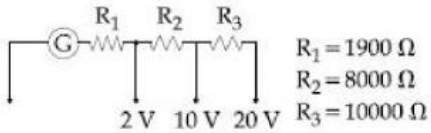
41652958278.



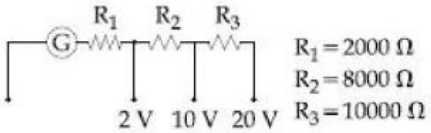
41652958279.



41652958280.



41652958281.



Question Number : 21 Question Id : 41652914876 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 magnetic compass needle oscillates 30 times per minute at a place where the dip is 45°, and 40 times per minute where the dip is 30°. If B_1 and B_2 are respectively the total magnetic field due to the earth at the two places, then the ratio B_1/B_2 is best given by :

Options :

41652958282. 0.7

41652958283. 1.8

41652958284. 2.2

41652958285. 3.6

Question Number : 21 Question Id : 41652914876 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 स्थानों पर नमन कोणों का मान क्रमश: 45° तथा 30° है। इन स्थानों पर एक चुम्बकीय सुई एक मिनट में क्रमश: 30 तथा 40 दोलन करती है। यदि, इन दो स्थानों पर पृथ्वी के कुल चुम्बकीय क्षेत्र की तीव्रता क्रमश: B_1 तथा B_2 है तो, अनुपात B_1/B_2 का निकटतम मान होगा :

Options :

41652958282. 0.7

41652958283. 1.8

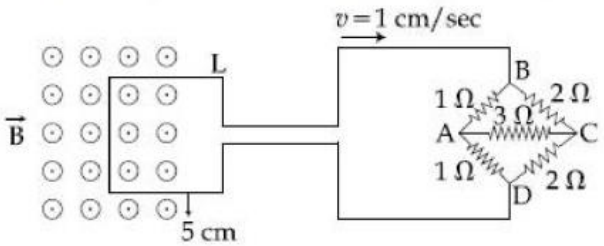
41652958284. 2.2

41652958285. 3.6

Question Number : 22 Question Id : 41652914877 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 figure shows a square loop L of side 5 cm which is connected to a network of resistances. The whole setup is moving towards right with a constant speed of $1\,cm\,s^{-1}$. At some instant, a part of L is in a uniform magnetic field of 1 T, perpendicular to the plane of the loop. If the resistance of L is 1.7 Ω, the current in the loop at that instant will be close to :



Options :

41652958286. $60\ \mu A$

41652958287. $115\ \mu A$

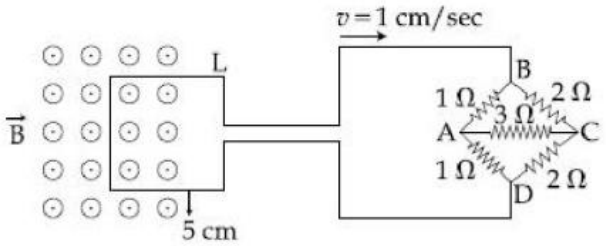
41652958288. $150\ \mu A$

41652958289. $170\ \mu A$

Question Number : 22 Question Id : 41652914877 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यहाँ आरेख में $5\ cm$ भुजा का एक वर्गाकार पाश L दर्शाया गया है, जो, प्रतिरोधों के एक परिपथ से जुड़ा है । यह संयोजन $1\ cm\ s^{-1}$ की एक समान चाल से, दायीं ओर गति कर रहा है। किसी क्षण L का एक भाग $1\ T$ तीव्रता के एकसमान चुम्बकीय क्षेत्र में है। यह क्षेत्र पाश L के समतल के लम्बवत् है। यदि, इस पाश का प्रतिरोध $1.7\ \Omega$ है तो , इस क्षण इसमें धारा का निकट मान होगा :



Options :

41652958286. $60\ \mu A$

41652958287. $115\ \mu A$

41652958288. $150\ \mu A$

41652958289. $170\ \mu A$

Question Number : 23 Question Id : 41652914878 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 electromagnetic wave is represented by the electric field

$\vec{E} = E_0 \hat{n} \sin[\omega t + (6y - 8z)]$. Taking unit vectors in x, y and z directions to be $\hat{i}$, $\hat{j}$, $\hat{k}$, the direction of propogation $\hat{s}$, is :

Options :

41652958290. $\hat{s} = \frac{3\hat{i} - 4\hat{j}}{5}$

41652958291. $\hat{s} = \left(\frac{-3\hat{j} + 4\hat{k}}{5}\right)$

41652958292. $\hat{s} = \frac{-4\hat{k} + 3\hat{j}}{5}$

41652958293. $\hat{s} = \frac{4\hat{j} - 3\hat{k}}{5}$

Question Number : 23 Question Id : 41652914878 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 विद्युत चुम्बकीय तरंग को, विद्युत क्षेत्र, $\vec{E} = E_0 \hat{n} \sin[\omega t + (6y - 8z)]$, से निरूपित किया जाता है। यदि x, y तथा z दिशा में इकाई सदिश क्रमशः $\hat{i}$, $\hat{j}$ तथा $\hat{k}$ हैं, संचरण की दिशा $\hat{s}$ के लिये, सही विकल्प है :

Options :

41652958290. $\hat{s} = \frac{3\hat{i} - 4\hat{j}}{5}$

41652958291. $\hat{s} = \left(\frac{-3\hat{j} + 4\hat{k}}{5}\right)$

41652958292. $\hat{s} = \frac{-4\hat{k} + 3\hat{j}}{5}$

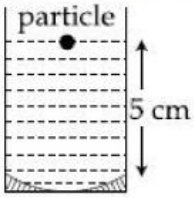
41652958293. $\hat{s} = \frac{4\hat{j} - 3\hat{k}}{5}$

Question Number : 24 Question Id : 41652914879 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 concave mirror has radius of curvature of 40 cm. It is at the bottom of a glass that has water filled up to 5 cm (see figure). If a small particle is floating on the surface of water, its image as seen, from directly above the glass, is at a distance d from the surface of water. The value of d is close to :

(Refractive index of water $= 1.33$)



Options :

41652958294. 11.7 cm

41652958295. 8.8 cm

41652958296. 6.7 cm

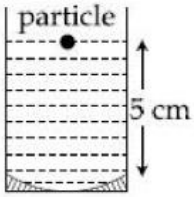
41652958297. 13.4 cm

Question Number : 24 Question Id : 41652914879 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

40 cm वक्रता त्रिज्या का एक अवतल दर्पण, आरेख (चित्र) में दर्शाये गये अनुसार, एक गिलास की तली में रखा है। गिलास में 5 cm ऊँचाई तक जल भरा है। एक छोटा सा कण जल की सतह पर तैर रहा है। गिलास के ठीक ऊपर से देखने पर, इस का प्रतिबिम्ब जल की सतह से d दूरी पर है। तो, d का निकट मान होगा :

(पानी का अपवर्तनांक $=1.33$)



Options :

41652958294. 11.7 cm

41652958295. 8.8 cm

41652958296. 6.7 cm

41652958297. 13.4 cm

Question Number : 25 Question Id : 41652914880 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 double slit experiment, when a thin film of thickness t having refractive index μ is introduced in front of one of the slits, the maximum at the centre of the fringe pattern shifts by one fringe width. The value of t is (λ is the wavelength of the light used) :

Options :

41652958298. $\frac{\lambda}{2(\mu-1)}$

41652958299. $\frac{2\lambda}{(\mu-1)}$

41652958300. $\frac{\lambda}{(\mu-1)}$

41652958301. $\frac{\lambda}{(2\mu-1)}$

Question Number : 25 Question Id : 41652914880 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 द्वि-झिरी प्रयोग में, किसी एक झिरी के सामने, t मोटाई तथा μ अपवर्तनांक की एक पतली फिल्म रख देने से, फ्रिंज पैटर्न के केन्द्रीय उच्चिष्ठ, एक फ्रिंज की चौड़ाई के बराबर विस्थापित हो जाता है। तो t का मान है : (λ प्रकाश की तरंगदैर्घ्य है)

Options :

41652958298. $\frac{\lambda}{2(\mu-1)}$

41652958299. $\frac{2\lambda}{(\mu-1)}$

41652958300. $\frac{\lambda}{(\mu-1)}$

41652958301. $\frac{\lambda}{(2\mu-1)}$

Question Number : 26 Question Id : 41652914881 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 numerical aperature of the objective lens of a microscope is 1.25. If light of wavelength 5000 Å is used, the minimum separation between two points, to be seen as distinct, will be :

Options :

41652958302. 0.48 μm

41652958303. 0.12 μm

41652958304. 0.38 μm

41652958305. 0.24 μm

Question Number : 26 Question Id : 41652914881 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 सूक्ष्मदर्शी के अभिदृश्यक लेन्स की संख्यात्मक द्वारक (numerical aperature) का मान 1.25 है। यदि 5000 Å तरंगदैर्ध्य का प्रकाश प्रयोग करें तो, दो बिन्दुओं को अलग-अलग देखने के लिये उनके बीच की न्यूनतम दूरी होगी :

Options :

41652958302. $0.48\ \mu m$

41652958303. $0.12\ \mu m$

41652958304. $0.38\ \mu m$

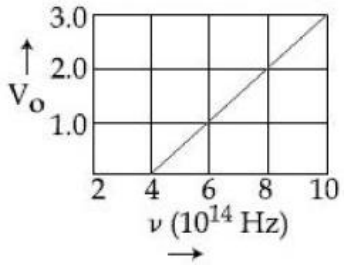
41652958305. $0.24\ \mu m$

Question Number : 27 Question Id : 41652914882 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 stopping potential V_o (in volt) as a function of frequency (ν) for a sodium emitter, is shown in the figure. The work function of sodium, from the data plotted in the figure, will be :

(Given : Planck's constant $(h) = 6.63 \times 10^{-34}$ Js, electron charge $e = 1.6 \times 10^{-19}$ C)



Options :

41652958306. 1.66 eV

41652958307. 1.82 eV

41652958308. 1.95 eV

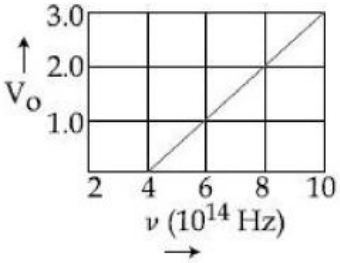
41652958309. 2.12 eV

Question Number : 27 Question Id : 41652914882 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यहाँ आरेख में, एक सोडियम-उत्सर्जक के लिये, आवृत्ति (ν) के फलन के रूप में, निरोधी विभव V_o (वोल्ट में) के परिवर्तन को दर्शाया गया है। इस ग्राफ से सोडियम का कार्य-फलन प्राप्त होगा :

(प्लाँक स्थिरांक (h) = 6.63×10^{-34} Js इलेक्ट्रॉन आवेश $e = 1.6 \times 10^{-19}$ C)



Options :

41652958306. 1.66 eV

41652958307. 1.82 eV

41652958308. 1.95 eV

41652958309. 2.12 eV

Question Number : 28 Question Id : 41652914883 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 excited He^+ ion emits two photons in succession, with wavelengths 108.5 nm and 30.4 nm, in making a transition to ground state. The quantum number n, corresponding to its initial excited state is (for photon of wavelength λ, energy $E = \frac{1240 \text{ eV}}{\lambda(\text{in nm})}$) :

Options :

41652958310. $n = 7$

41652958311. $n = 6$

41652958312. $n = 5$

41652958313. $n = 4$

Question Number : 28 Question Id : 41652914883 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 उत्तेजित He^+ आयन, अपनी न्यूनतम ऊर्जा अवस्था में संक्रमण होने तक दो क्रमागत फोटॉन, जिनके तरंगदैर्ध्य 108.5 nm तथा 30.4 nm हैं, उत्सर्जित करता है। प्रारंभिक उत्तेजित अवस्था के संगत क्वॉन्टम संख्या n है : (λ तरंगदैर्घ्य के लिये फोटॉन की ऊर्जा $= \frac{1240\ \text{eV}}{\lambda(\text{in nm})}$) :

Options :

41652958310. $n=7$

41652958311. $n=6$

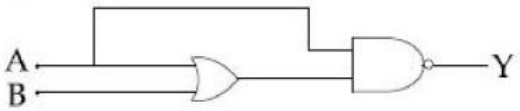
41652958312. $n=5$

41652958313. $n=4$

Question Number : 29 Question Id : 41652914884 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 truth table for the circuit given in the fig. is :



Options :

41652958314.

A	B	Y
0	0	1
0	1	1
1	0	0
1	1	0

41652958315.

A	B	Y
0	0	0
0	1	0
1	0	1
1	1	1

41652958316.

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

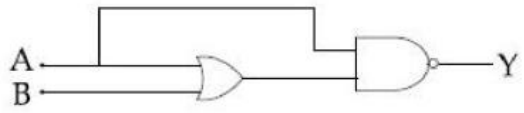
41652958317.

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	1

Question Number : 29 Question Id : 41652914884 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 के लिये सत्यमान सारणी है :



Options :

41652958314.

A	B	Y
0	0	1
0	1	1
1	0	0
1	1	0

41652958315.

A	B	Y
0	0	0
0	1	0
1	0	1
1	1	1

41652958316.

A	B	Y
0	0	1
0	1	0
1	0	0
1	1	0

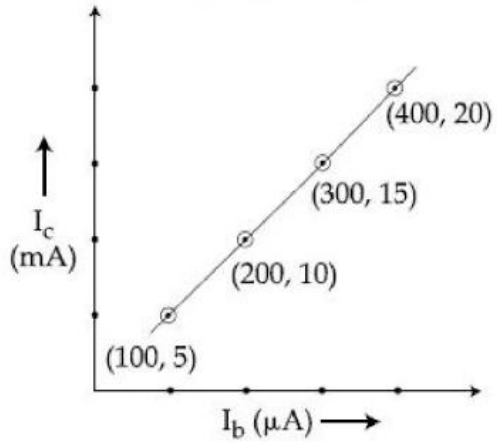
41652958317.

A	B	Y
0	0	1
0	1	1
1	0	1
1	1	1

Question Number : 30 Question Id : 41652914885 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 transfer characteristic curve of a transistor, having input and output resistance 100 Ω and 100 kΩ respectively, is shown in the figure. The Voltage and Power gain, are respectively :



Options :

41652958318. $5\times10^4,\ 5\times10^6$

41652958319. $5\times10^4,\ 2.5\times10^6$

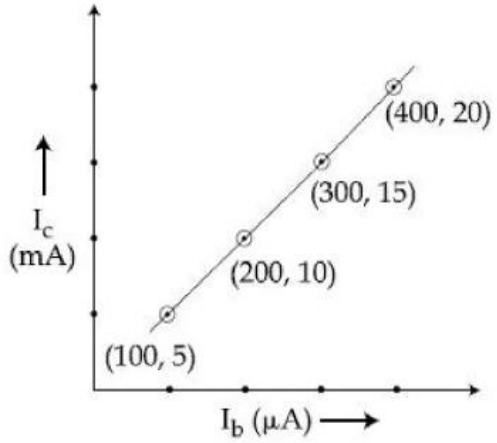
41652958320. $5\times10^4,\ 5\times10^5$

41652958321. $2.5\times10^4,\ 2.5\times10^6$

Question Number : 30 Question Id : 41652914885 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

किसी ट्रांजिस्टर के, निवेश तथा निर्गम प्रतिरोध क्रमश: $100\,\Omega$ तथा $100\,k\Omega$ हैं। इसके लिये अंतरण अभिलक्षण वक्र यहाँ दर्शाया गया है। तो, वोल्टता तथा शक्ति लब्धि हैं क्रमश:



Options :

41652958318. 5×10^4 तथा 5×10^6

41652958319. 5×10^4 तथा 2.5×10^6

41652958320. 5×10^4 तथा 5×10^5

41652958321. 2.5×10^4 तथा 2.5×10^6

Chemistry

Section Id :	416529323
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:	416529463
Question Shuffling Allowed :	Yes

Question Number : 31 Question Id : 41652914886 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 statements is not true about RNA ?

Options :

41652958322. It is present in the nucleus of the cell

41652958323. It has always double stranded α-helix structure

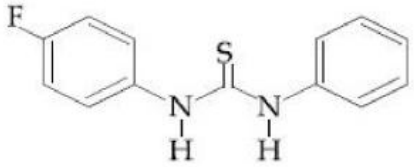
41652958324. It controls the synthesis of protein

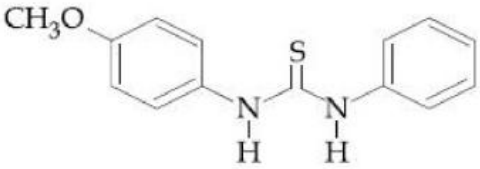
41652958325. It usually does not replicate

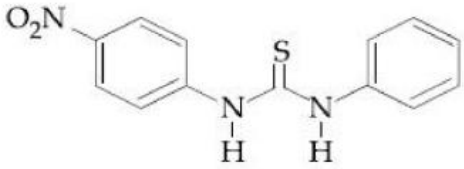
Question Number : 31 Question Id : 41652914886 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

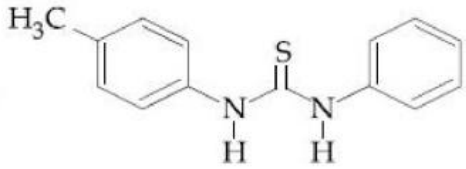


The increasing order of the pK_b of the following compound is :

(A) 

(B) 

(C) 

(D) 

Options :

41652958326. (A) < (C) < (D) < (B)

41652958327. (B) < (D) < (C) < (A)

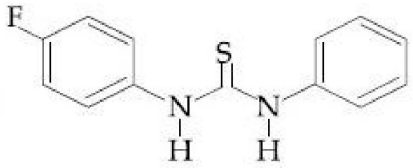
41652958328. (B) < (D) < (A) < (C)

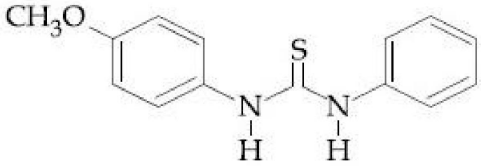
41652958329. (C) < (A) < (D) < (B)

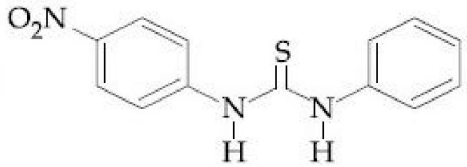
Question Number : 32 Question Id : 41652914887 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

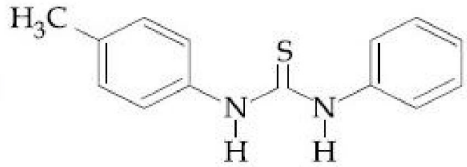
Correct Marks : 4 Wrong Marks : 1

निम्न यौगिकों के pK_b का बढ़ता क्रम है :

(A) 

(B) 

(C) 

(D) 

Options :

41652958326. (A) < (C) < (D) < (B)

41652958327. (B) < (D) < (C) < (A)

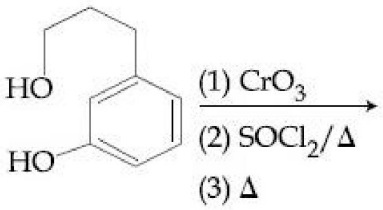
41652958328. (B) < (D) < (A) < (C)

41652958329. (C) < (A) < (D) < (B)

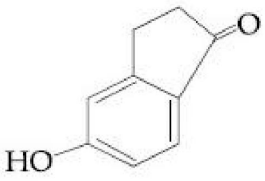
Question Number : 33 Question Id : 41652914888 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

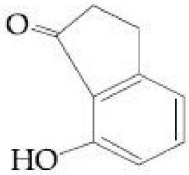
Correct Marks : 4 Wrong Marks : 1

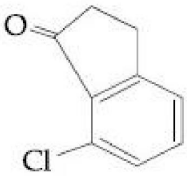
The major product of the following reaction is :

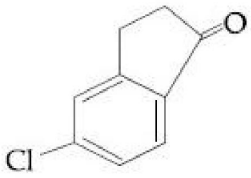


Options :

41652958330. 

41652958331. 

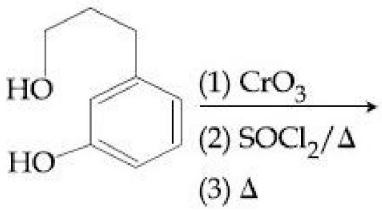
41652958332. 

41652958333. 

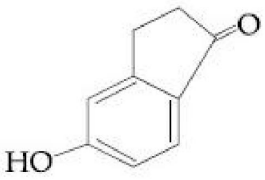
Question Number : 33 Question Id : 41652914888 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

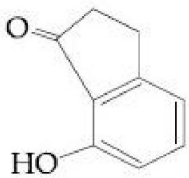
Correct Marks : 4 Wrong Marks : 1

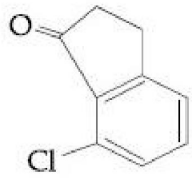
निम्न अभिक्रिया का मुख्य उत्पाद है :

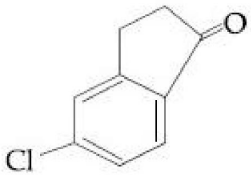


Options :

41652958330. 

41652958331. 

41652958332. 

41652958333. 

Question Number : 34 Question Id : 41652914889 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Glucose and Galactose are having identical configuration in all the positions except position.

Options :

41652958334. C – 2

41652958335. C – 3

41652958336. C – 4

41652958337. C – 5

Question Number : 34 Question Id : 41652914889 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ग्लुकोज तथा गैलक्टोज के विन्यास निम्न के अतिरिक्त सभी स्थानों पर एक जैसे हैं :

Options :

41652958334. C – 2

41652958335. C – 3

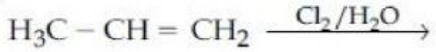
41652958336. C – 4

41652958337. C – 5

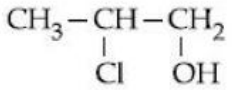
Question Number : 35 Question Id : 41652914890 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

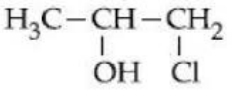
Correct Marks : 4 Wrong Marks : 1

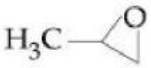
The major product of the following addition reaction is

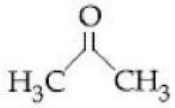


Options :

41652958338. 

41652958339. 

41652958340. 

41652958341. 

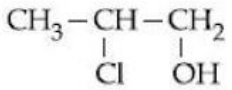
Question Number : 35 Question Id : 41652914890 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

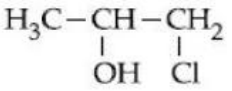
Correct Marks : 4 Wrong Marks : 1

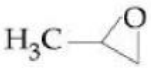
निम्नलिखित योगात्मक अभिक्रिया का मुख्य उत्पाद है :

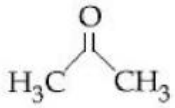


Options :

41652958338. 

41652958339. 

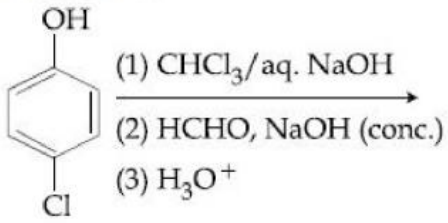
41652958340. 

41652958341. 

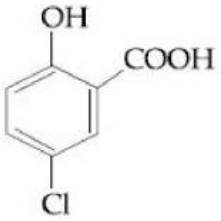
Question Number : 36 Question Id : 41652914891 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

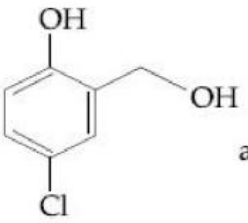
Correct Marks : 4 Wrong Marks : 1

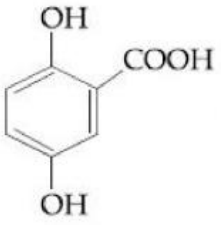
The major products of the following reaction are :

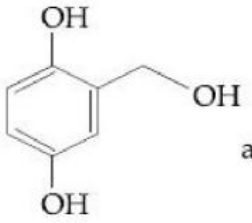


Options :

41652958342.  and Methanol

41652958343.  and Formic acid

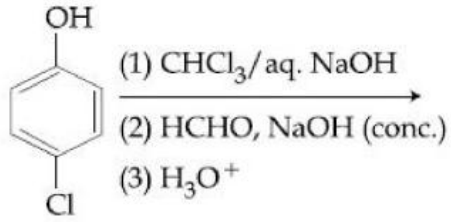
41652958344.  and Methanol

41652958345.  and Formic acid

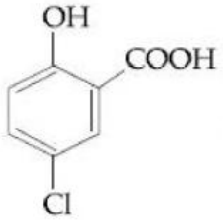
Question Number : 36 Question Id : 41652914891 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

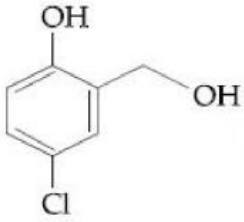
Correct Marks : 4 Wrong Marks : 1

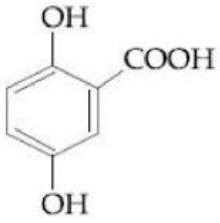
निम्न अभिक्रिया के मुख्य उत्पाद हैं :

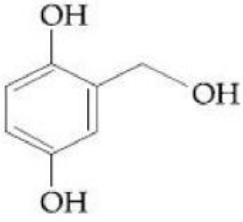


Options :

41652958342.  तथा मेथेनॉल

41652958343.  तथा फार्मिक एसिड

41652958344.  तथा मेथेनॉल

41652958345.  तथा फार्मिक एसिड

Question Number : 37 Question Id : 41652914892 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 thermosetting polymer ?

Options :

41652958346. PVC

41652958347. Bakelite

41652958348. Nylon 6

41652958349. Buna-N

Question Number : 37 Question Id : 41652914892 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 सा तापदृढ़ बहुलक है?

Options :

41652958346. पी.वी.सी.

41652958347. बेकेलाइट

41652958348. नाईलॉन 6

41652958349. ब्यूना-N

Question Number : 38 Question Id : 41652914893 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

But-2-ene on reaction with alkaline $KMnO_4$ at elevated temperature followed by acidification will give :

Options :

41652958350. $CH_3-\underset{\underset{OH}{|}}{CH}-\underset{\underset{OH}{|}}{CH}-CH_3$

41652958351. 2 molecules of CH_3CHO

41652958352. one molecule of CH_3CHO and one molecule of CH_3COOH

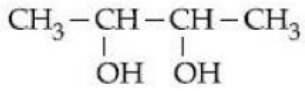
41652958353. 2 molecules of CH_3COOH

Question Number : 38 Question Id : 41652914893 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

ब्यूट-2-ईन के क्षारीय $KMnO_4$ के साथ अभिक्रिया करने तत्पश्चात् उच्च ताप पर अम्लीकृत करने पर प्राप्त होता है :

Options :

41652958350. 

41652958351. CH_3CHO के दो अणु

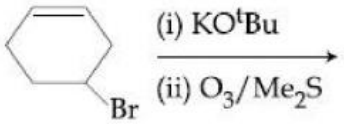
41652958352. CH_3CHO का एक अणु तथा CH_3COOH का एक अणु

41652958353. CH_3COOH के दो अणु

Question Number : 39 Question Id : 41652914894 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(s) obtained in the following reaction is/are :

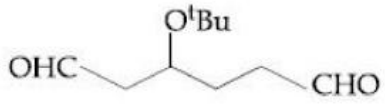


Options :

41652958354. 

41652958355. 

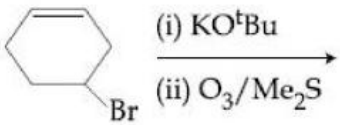
41652958356. 

41652958357. 

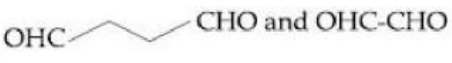
Question Number : 39 Question Id : 41652914894 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया से प्राप्त मुख्य उत्पाद है/हैं :

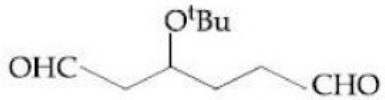


Options :

41652958354. 

41652958355. 

41652958356. 

41652958357. 

Question Number : 40 Question Id : 41652914895 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 organic compound 'A' is oxidized with Na_2O_2 followed by boiling with HNO_3. The resultant solution is then treated with ammonium molybdate to yield a yellow precipitate.

Based on above observation, the element present in the given compound is :

Options :

41652958358. Sulphur

41652958359. Nitrogen

41652958360. Fluorine

41652958361. Phosphorus

Question Number : 40 Question Id : 41652914895 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 कार्बनिक यौगिक 'A' को Na_2O_2 के साथ आक्सीकृत किया जाता है, तत्पश्चात् उसे HNO_3 के साथ उबाला जाता है। फिर परिणामी विलयन को अमोनियम मालीब्डेट के साथ अभिकृत किया जाता है जो पीला अवक्षेप देता है।

उपरोक्त प्रेक्षणों के आधार पर यौगिक में उपस्थित तत्व है :

Options :

41652958358. सल्फर

41652958359. नाइट्रोजन

41652958360. फ्लोरीन

41652958361. फास्फोरस

Question Number : 41 Question Id : 41652914896 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 group number, number of valence electrons, and valency of an element with atomic number 15, respectively, are :

Options :

41652958362. 15, 6 and 2

41652958363. 16, 6 and 3

41652958364. 15, 5 and 3

41652958365. 16, 5 and 2

Question Number : 41 Question Id : 41652914896 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

जिस तत्व की परमाणु संख्या 15 है उसकी ग्रुप संख्या, उसके संयोजकता इलेक्ट्रॉनों की संख्या तथा उसकी संयोजकता क्रमश: होगी :

Options :

41652958362. 15, 6 तथा 2

41652958363. 16, 6 तथा 3

41652958364. 15, 5 तथा 3

41652958365. 16, 5 तथा 2

Question Number : 42 Question Id : 41652914897 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 idea of froth floatation method came from a person X and this method is related to the process Y of ores. X and Y, respectively, are :

Options :

41652958366. washer man and reduction

41652958367. washer woman and concentration

41652958368. fisher woman and concentration

41652958369. fisher man and reduction

Question Number : 42 Question Id : 41652914897 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

झाग प्लवन विधि के लिये विचार एक व्यक्ति X से आया था तथा यह विधि अयस्क के प्रक्रम Y से सम्बन्धित है। X तथा Y क्रमश: हैं :

Options :

41652958366. धोबी तथा अपचयन

41652958367. धोबिन तथा सान्द्रता

41652958368. मछुआरिन तथा सान्द्रता

41652958369. मछुआरा तथा अपचयन

Question Number : 43 Question Id : 41652914898 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 metal that gives hydrogen gas upon treatment with both acid as well as base is :

Options :

41652958370. magnesium

41652958371. iron

41652958372. zinc

41652958373. mercury

Question Number : 43 Question Id : 41652914898 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 धातु जो अम्ल एवं क्षारक दोनों के ही साथ अभिकृत करने पर हाइड्रोजन देता है, होगी :

Options :

41652958370. मैग्नीशियम

41652958371. आयरन

41652958372. जिंक

41652958373. मर्करी

Question Number : 44 Question Id : 41652914899 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 sequence of thermal stability of the following carbonates is :

Options :

41652958374. $MgCO_3 < CaCO_3 < SrCO_3 < BaCO_3$

41652958375. $MgCO_3 < SrCO_3 < CaCO_3 < BaCO_3$

41652958376. $BaCO_3 < CaCO_3 < SrCO_3 < MgCO_3$

41652958377. $BaCO_3 < SrCO_3 < CaCO_3 < MgCO_3$

Question Number : 44 Question Id : 41652914899 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 कार्बोनेटों के तापीय स्थायित्व का सही क्रम है :

Options :

41652958374. $MgCO_3 < CaCO_3 < SrCO_3 < BaCO_3$

41652958375. $MgCO_3 < SrCO_3 < CaCO_3 < BaCO_3$

41652958376. $BaCO_3 < CaCO_3 < SrCO_3 < MgCO_3$

41652958377. $BaCO_3 < SrCO_3 < CaCO_3 < MgCO_3$

Question Number : 45 Question Id : 41652914900 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 statement among the following is :

Options :

41652958378. $(SiH_3)_3N$ is pyramidal and more basic than $(CH_3)_3N$.

41652958379. $(SiH_3)_3N$ is pyramidal and less basic than $(CH_3)_3N$.

41652958380. $(SiH_3)_3N$ is planar and more basic than $(CH_3)_3N$.

41652958381. $(SiH_3)_3N$ is planar and less basic than $(CH_3)_3N$.

Question Number : 45 Question Id : 41652914900 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 में से **सही** कथन है :

Options :

41652958378. $(SiH_3)_3N$ पिरामिडी है तथा $(CH_3)_3N$ से ज्यादा क्षारीय है

41652958379. $(SiH_3)_3N$ पिरामिडी है तथा $(CH_3)_3N$ से कम क्षारीय है

41652958380. $(SiH_3)_3N$ समतली है तथा $(CH_3)_3N$ से ज्यादा क्षारीय है

41652958381. $(SiH_3)_3N$ समतली है तथा $(CH_3)_3N$ से कम क्षारीय है

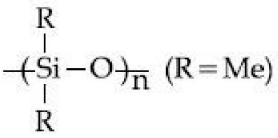
Question Number : 46 Question Id : 41652914901 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The basic structural unit of feldspar, zeolites, mica, and asbestos is :

Options :

41652958382. SiO_2

41652958383. 

41652958384. $(SiO_3)^{2-}$

41652958385. $(SiO_4)^{4-}$

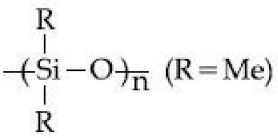
Question Number : 46 Question Id : 41652914901 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

फेल्डस्पार, ज़िओलाइट, माइका तथा एस्बेस्टॉस की मूल संरचना इकाई है :

Options :

41652958382. SiO_2

41652958383. 

41652958384. $(SiO_3)^{2-}$

41652958385. $(SiO_4)^{4-}$

Question Number : 47 Question Id : 41652914902 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 example of a disproportionation reaction is :

Options :

41652958386. $2\,MnO_4^- + 10\,I^- + 16\,H^+ \rightarrow 2\,Mn^{2+} + 5\,I_2 + 8\,H_2O$

41652958387. $2\,KMnO_4 \rightarrow K_2MnO_4 + MnO_2 + O_2$

41652958388. $2\,CuBr \rightarrow CuBr_2 + Cu$

41652958389. $2\,NaBr + Cl_2 \rightarrow 2\,NaCl + Br_2$

Question Number : 47 Question Id : 41652914902 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 असमानुपातन अभिक्रिया का उदाहरण है :

Options :

41652958386. $2\,MnO_4^- + 10\,I^- + 16\,H^+ \rightarrow 2\,Mn^{2+} + 5\,I_2 + 8\,H_2O$

41652958387. $2\,KMnO_4 \rightarrow K_2MnO_4 + MnO_2 + O_2$

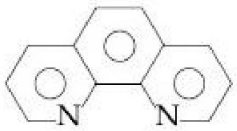
41652958388. $2\,CuBr \rightarrow CuBr_2 + Cu$

41652958389. $2\,NaBr + Cl_2 \rightarrow 2\,NaCl + Br_2$

Question Number : 48 Question Id : 41652914903 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 complex ion that will lose its crystal field stabilization energy upon oxidation of its metal to +3 state is :

(Phen = 

and

ignore pairing energy)

Options :

41652958390. $[Co(phen)_3]^{2+}$

41652958391. $[Ni(phen)_3]^{2+}$

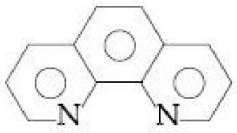
41652958392. $[Fe(phen)_3]^{2+}$

41652958393. $[Zn(phen)_3]^{2+}$

Question Number : 48 Question Id : 41652914903 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 संकुल आयन जो अपनी धातु को +3 अवस्था में उपचयित करने पर अपनी क्रिस्टल क्षेत्र स्थायीकरण ऊर्जा खो देता है, होगा :

(Phen = 

तथा
युग्मन ऊर्जा को छोड़ दें)

Options :

41652958390. $[Co(phen)_3]^{2+}$

41652958391. $[Ni(phen)_3]^{2+}$

41652958392. $[Fe(phen)_3]^{2+}$

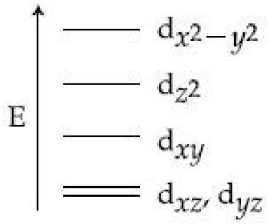
41652958393. $[Zn(phen)_3]^{2+}$

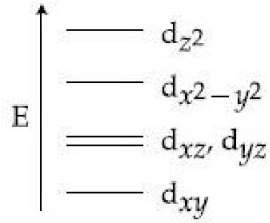
Question Number : 49 Question Id : 41652914904 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

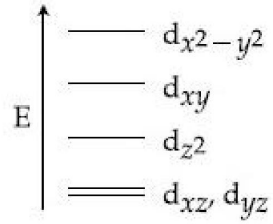
Correct Marks : 4 Wrong Marks : 1

Complete removal of both the axial ligands (along the *z*-axis) from an octahedral complex leads to which of the following splitting patterns? (relative orbital energies not on scale).

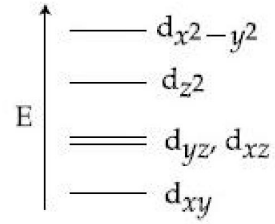
Options :

41652958394. 

41652958395. 



41652958396.



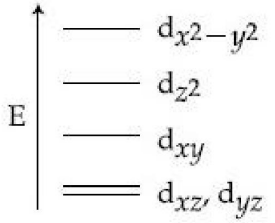
41652958397.

Question Number : 49 Question Id : 41652914904 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

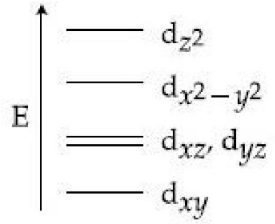
Correct Marks : 4 Wrong Marks : 1

अष्टफलकीय संकर से (z-अक्ष के साथ) दोनों अक्षीय लिगण्ड के पूर्ण रूप से हटाने से किस विपाटन पैटर्न में परिवर्तन होता है?

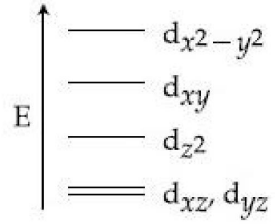
Options :



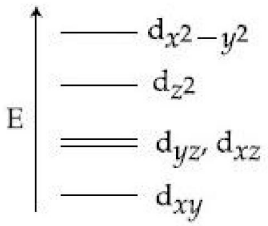
41652958394.



41652958395.



41652958396.

41652958397. 

Question Number : 50 Question Id : 41652914905 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 set of species responsible for the photochemical smog is :

Options :

41652958398. N_2, O_2, O_3 and hydrocarbons

41652958399. N_2, NO_2 and hydrocarbons

41652958400. NO, NO_2, O_3 and hydrocarbons

41652958401. CO_2, NO_2, SO_2 and hydrocarbons

Question Number : 50 Question Id : 41652914905 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

प्रकाश रसायनिक धूमकुहा के लिये उत्तरदायी स्पीशीज़ का **सही** सेट है :

Options :

41652958398. N_2, O_2, O_3 तथा हाइड्रोकार्बन

41652958399. N_2, NO_2 तथा हाइड्रोकार्बन

41652958400. NO, NO_2, O_3 तथा हाइड्रोकार्बन

41652958401. CO_2, NO_2, SO_2 तथा हाइड्रोकार्बन

Question Number : 51 Question Id : 41652914906 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 moles of AB_2 weigh 125×10^{-3} kg and 10 moles of A_2B_2 weigh 300×10^{-3} kg. The molar mass of A (M_A) and molar mass of B (M_B) in kg mol^{-1} are :

Options :

41652958402. $M_A = 5 \times 10^{-3}$ and $M_B = 10 \times 10^{-3}$

41652958403. $M_A = 10 \times 10^{-3}$ and $M_B = 5 \times 10^{-3}$

41652958404. $M_A = 25 \times 10^{-3}$ and $M_B = 50 \times 10^{-3}$

41652958405. $M_A = 50 \times 10^{-3}$ and $M_B = 25 \times 10^{-3}$

Question Number : 51 Question Id : 41652914906 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

AB_2 के 5 मोल का भार 125×10^{-3} kg तथा A_2B_2 के 10 मोल का भार 300×10^{-3} kg है। A का मोलर द्रव्यमान (M_A) तथा B का मोलर द्रव्यमान (M_B) ($kg\ mol^{-1}$ में) होंगे :

Options :

41652958402. $M_A = 5 \times 10^{-3}$ तथा $M_B = 10 \times 10^{-3}$

41652958403. $M_A = 10 \times 10^{-3}$ तथा $M_B = 5 \times 10^{-3}$

41652958404. $M_A = 25 \times 10^{-3}$ तथा $M_B = 50 \times 10^{-3}$

41652958405. $M_A = 50 \times 10^{-3}$ तथा $M_B = 25 \times 10^{-3}$

Question Number : 52 Question Id : 41652914907 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 element has a face-centred cubic (fcc) structure with a cell edge of a. The distance between the centres of two nearest tetrahedral voids in the lattice is :

Options :

41652958406. a

41652958407. $\frac{3}{2}a$

41652958408. $\frac{a}{2}$

41652958409. $\sqrt{2}a$

Question Number : 52 Question Id : 41652914907 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 तत्व की फलकेन्द्रस्थ घनीय (एफसीसी) संरचना है जिसके सेल का कोर a है। लैटिस में दो निकटतम चतुष्फलकीय रिक्तियों के केन्द्रों के बीच की दूरी होगी :

Options :

41652958406. a

41652958407. $\frac{3}{2}a$

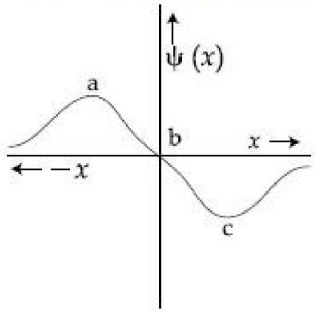
41652958408. $\frac{a}{2}$

41652958409. $\sqrt{2}a$

Question Number : 53 Question Id : 41652914908 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 electrons are more likely to be found :



Options :

41652958410. only in the region a

41652958411. in the region a and b

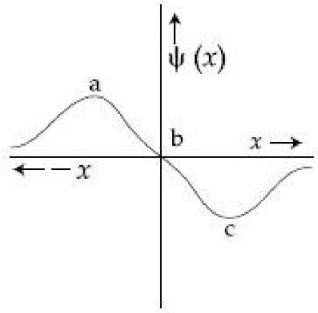
41652958412. only in the region c

41652958413. in the region a and c

Question Number : 53 Question Id : 41652914908 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

इलेक्ट्रॉनों के पाये जाने की ज्यादा संभावना है :



Options :

41652958410. मात्र a क्षेत्र में

41652958411. a तथा b क्षेत्र में

41652958412. मात्र c क्षेत्र में

41652958413. a तथा c क्षेत्र में

Question Number : 54 Question Id : 41652914909 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Enthalpy of sublimation of iodine is 24 cal g^{-1} at 200 °C. If specific heat of $I_2(s)$ and $I_2(vap)$ are 0.055 and 0.031 cal $g^{-1}K^{-1}$ respectively, then enthalpy of sublimation of iodine at 250 °C in cal g^{-1} is :

Options :

41652958414. 22.8

41652958415. 11.4

41652958416. 5.7

41652958417. 2.85

Question Number : 54 Question Id : 41652914909 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

200 °C पर, आयोडीन की ऊर्ध्वपातन एन्थैल्पी 24 cal g^{-1} है। यदि $I_2(s)$ तथा $I_2(vap)$ की विशिष्ट ऊष्मायें क्रमश: 0.055 तथा 0.031 cal $g^{-1}K^{-1}$ हों तो 250 °C पर आयोडीन की ऊर्ध्वपातन एन्थैल्पी (cal g^{-1} में) होगी :

Options :

41652958414. 22.8

41652958415. 11.4

41652958416. 5.7

41652958417. 2.85

Question Number : 55 Question Id : 41652914910 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 ideal gas is allowed to expand from 1 L to 10 L against a constant external pressure of 1 bar. The work done in kJ is :

Options :

41652958418. -0.9

41652958419. -2.0

41652958420. $+10.0$

41652958421. -9.0

Question Number : 55 Question Id : 41652914910 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 आदर्श गैस को स्थिर बाह्य दाब 1 बार के विरुद्ध 1 L से 10 L तक प्रसारित होने दिया जाता है। किया गया कार्य (kJ में) होगा :

Options :

41652958418. -0.9

41652958419. -2.0

41652958420. $+10.0$

41652958421. -9.0

Question Number : 56 Question Id : 41652914911 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 mole fraction of a solvent in aqueous solution of a solute is 0.8. The molality (in mol kg^{-1}) of the aqueous solution is :

Options :

41652958422. 13.88

41652958423. 13.88×10^{-1}

41652958424. 13.88×10^{-2}

41652958425. 13.88×10^{-3}

Question Number : 56 Question Id : 41652914911 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 विलेय के जलीय विलयन में विलायक का मोल अंश 0.8 है। जलीय विलयन की मोललता (mol kg^{-1} में) होगी :

Options :

41652958422. 13.88

41652958423. 13.88×10^{-1}

41652958424. 13.88×10^{-2}

41652958425. 13.88×10^{-3}

Question Number : 57 Question Id : 41652914912 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

What is the molar solubility of $Al(OH)_3$ in 0.2 M NaOH solution ? Given that, solubility product of $Al(OH)_3 = 2.4 \times 10^{-24}$:

Options :

41652958426. 3×10^{-22}

41652958427. 3×10^{-19}

41652958428. 12×10^{-23}

41652958429. 12×10^{-21}

Question Number : 57 Question Id : 41652914912 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

0.2 M NaOH विलयन में $Al(OH)_3$ की मोलर विलेयता क्या होगी? दिया गया है : $Al(OH)_3$ का विलेयता स्थिरांक 2.4×10^{-24}

Options :

41652958426. 3×10^{-22}

41652958427. 3×10^{-19}

41652958428. 12×10^{-23}

41652958429. 12×10^{-21}

Question Number : 58 Question Id : 41652914913 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 :

$Co^{3+} + e^- \rightarrow Co^{2+}; E^\circ = +1.81\ V$

$Pb^{4+} + 2e^- \rightarrow Pb^{2+}; E^\circ = +1.67\ V$

$Ce^{4+} + e^- \rightarrow Ce^{3+}; E^\circ = +1.61\ V$

$Bi^{3+} + 3e^- \rightarrow Bi; E^\circ = +0.20\ V$

Oxidizing power of the species will increase in the order :

Options :

41652958430. $Co^{3+} < Ce^{4+} < Bi^{3+} < Pb^{4+}$

41652958431. $Co^{3+} < Pb^{4+} < Ce^{4+} < Bi^{3+}$

41652958432. $Bi^{3+} < Ce^{4+} < Pb^{4+} < Co^{3+}$

41652958433. $Ce^{4+} < Pb^{4+} < Bi^{3+} < Co^{3+}$

Question Number : 58 Question Id : 41652914913 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दिया गया है

$Co^{3+} + e^- \rightarrow Co^{2+}; E^\circ = +1.81\ V$

$Pb^{4+} + 2e^- \rightarrow Pb^{2+}; E^\circ = +1.67\ V$

$Ce^{4+} + e^- \rightarrow Ce^{3+}; E^\circ = +1.61\ V$

$Bi^{3+} + 3e^- \rightarrow Bi; E^\circ = +0.20\ V$

स्पीशीज़ की उपचायक सामर्थ्य इस क्रम में बढ़ेगी :

Options :

41652958430. $Co^{3+} < Ce^{4+} < Bi^{3+} < Pb^{4+}$

41652958431. $Co^{3+} < Pb^{4+} < Ce^{4+} < Bi^{3+}$

41652958432. $Bi^{3+} < Ce^{4+} < Pb^{4+} < Co^{3+}$

41652958433. $Ce^{4+} < Pb^{4+} < Bi^{3+} < Co^{3+}$

Question Number : 59 Question Id : 41652914914 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 following reaction; $xA \rightarrow yB$

$$\log_{10}\left[-\frac{d[A]}{dt}\right] = \log_{10}\left[\frac{d[B]}{dt}\right] + 0.3010$$

'A' and 'B' respectively can be :

Options :

41652958434. C_2H_2 and C_6H_6

41652958435. n-Butane and Iso-butane

41652958436. C_2H_4 and C_4H_8

41652958437. N_2O_4 and NO_2

Question Number : 59 Question Id : 41652914914 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 में, $xA \rightarrow yB$

$$\log_{10}\left[-\frac{d[A]}{dt}\right] = \log_{10}\left[\frac{d[B]}{dt}\right] + 0.3010$$

'A' तथा 'B' क्रमशः हो सकते हैं :

Options :

41652958434. C_2H_2 तथा C_6H_6

41652958435. n-ब्यूटेन तथा आइसोब्यूटेन

41652958436. C_2H_4 तथा C_4H_8

41652958437. N_2O_4 तथा NO_2

Question Number : 60 Question Id : 41652914915 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Peptization is a :

Options :

41652958438. process of converting a colloidal solution into precipitate

41652958439. process of converting precipitate into colloidal solution

41652958440. process of converting soluble particles to form colloidal solution

41652958441. process of bringing colloidal molecule into solution

Question Number : 60 Question Id : 41652914915 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

पेप्टाइजेशन है :

Options :

41652958438. कोलाइडी विलयन को अवक्षेप में बदलने का प्रक्रम

41652958439. अवक्षेप को कोलाइडी विलयन में बदलने का प्रक्रम

41652958440. विलेय कणों को कोलाइडी विलयन में बदलने का प्रक्रम

41652958441. कोलाइडी अणुओं को विलयन में लाने का प्रक्रम

Mathematics

Section Id :	416529324
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: 416529464
Question Shuffling Allowed : Yes

Question Number : 61 Question Id : 41652914916 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

For $x \in \left(0, \frac{3}{2}\right)$, let $f(x) = \sqrt{x}$, $g(x) = \tan x$

and $h(x) = \frac{1 - x^2}{1 + x^2}$. If $\phi(x) = ((hof)og)(x)$,

then $\phi\left(\frac{\pi}{3}\right)$ is equal to :

Options :

41652958442. $\tan\frac{\pi}{12}$

41652958443. $\tan\frac{5\pi}{12}$

41652958444. $\tan\frac{7\pi}{12}$

41652958445. $\tan\frac{11\pi}{12}$

Question Number : 61 Question Id : 41652914916 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 4 Wrong Marks : 1

$x \in \left(0, \frac{3}{2}\right)$ के लिए माना $f(x) = \sqrt{x}$,

$g(x) = \tan x$ तथा $h(x) = \frac{1 - x^2}{1 + x^2}$. यदि

$\phi(x) = ((hof)og)(x)$, तो $\phi\left(\frac{\pi}{3}\right)$ बराबर है :

Options :

41652958442. $\tan\frac{\pi}{12}$

41652958443. $\tan\frac{5\pi}{12}$

41652958444. $\tan\frac{7\pi}{12}$

41652958445. $\tan\frac{11\pi}{12}$

Question Number : 62 Question Id : 41652914917 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 equation $375x^2-25x-2=0$, then

$\lim\limits_{n\to\infty}\sum\limits_{r=1}^{n}\alpha^r + \lim\limits_{n\to\infty}\sum\limits_{r=1}^{n}\beta^r$ is equal to :

Options :

41652958446. $\frac{7}{116}$

41652958447. $\frac{1}{12}$

41652958448. $\frac{29}{358}$

41652958449. $\frac{21}{346}$

Question Number : 62 Question Id : 41652914917 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 समीकरण $375x^2-25x-2=0$ के मूल α तथा β हैं, तो $\lim\limits_{n\to\infty}\sum\limits_{r=1}^{n}\alpha^r + \lim\limits_{n\to\infty}\sum\limits_{r=1}^{n}\beta^r$ बराबर है :

Options :

41652958446. $\frac{7}{116}$

41652958447. $\frac{1}{12}$

41652958448. $\frac{29}{358}$

41652958449. $\frac{21}{346}$

Question Number : 63 Question Id : 41652914918 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 equation $|z-i|=|z-1|$, $i=\sqrt{-1}$, represents :

Options :

41652958450. a circle of radius 1.

41652958451. a circle of radius $\frac{1}{2}$.

41652958452. the line through the origin with slope -1.

41652958453. the line through the origin with slope 1.

Question Number : 63 Question Id : 41652914918 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समीकरण $|z-i|=|z-1|$, $i=\sqrt{-1}$, निम्न में से किसको निरूपित करती है?

Options :

41652958450. त्रिज्या 1 का एक वृत्त।

41652958451. त्रिज्या $\frac{1}{2}$ का एक वृत्त।

41652958452. मूलबिन्दु से होकर जाने वाली रेखा जिसका ढाल -1 है।

41652958453. मूलबिन्दु से होकर जाने वाली रेखा जिसका ढाल 1 है।

Question Number : 64 Question Id : 41652914919 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 $B=\begin{bmatrix}5 & 2\alpha & 1\\ 0 & 2 & 1\\ \alpha & 3 & -1\end{bmatrix}$ is the inverse of a 3×3 matrix A, then the sum of all values of α for which $\det(A)+1=0$, is :

Options :

41652958454. 2

41652958455. 1

41652958456. 0

41652958457. -1

Question Number : 64 Question Id : 41652914919 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 एक 3×3 के आव्यूह A का व्युत्क्रम (inverse) $B=\begin{bmatrix}5 & 2\alpha & 1\\ 0 & 2 & 1\\ \alpha & 3 & -1\end{bmatrix}$ है, तो α के उन सभी मानों का योग, जिनके लिए $\det(A)+1=0$ है, है :

Options :

41652958454. 2

41652958455. 1

41652958456. 0

41652958457. -1

Question Number : 65 Question Id : 41652914920 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 is a symmetric matrix and B is a skew-symmetrix matrix such that $A+B=\begin{bmatrix}2 & 3\\ 5 & -1\end{bmatrix}$, then AB is equal to :

Options :

41652958458. $\begin{bmatrix} -4 & 2 \\ 1 & 4 \end{bmatrix}$

41652958459. $\begin{bmatrix} 4 & -2 \\ 1 & -4 \end{bmatrix}$

41652958460. $\begin{bmatrix} 4 & -2 \\ -1 & -4 \end{bmatrix}$

41652958461. $\begin{bmatrix} -4 & -2 \\ -1 & 4 \end{bmatrix}$

Question Number : 65 Question Id : 41652914920 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 एक सममित (symmetric) आव्यूह A तथा एक विषम सममित (skew-symmetrix) आव्यूह B इस प्रकार हैं कि

$A + B = \begin{bmatrix} 2 & 3 \\ 5 & -1 \end{bmatrix}$, तो AB बराबर है :

Options :

41652958458. $\begin{bmatrix} -4 & 2 \\ 1 & 4 \end{bmatrix}$

41652958459. $\begin{bmatrix} 4 & -2 \\ 1 & -4 \end{bmatrix}$

41652958460. $\begin{bmatrix} 4 & -2 \\ -1 & -4 \end{bmatrix}$

41652958461. $\begin{bmatrix} -4 & -2 \\ -1 & 4 \end{bmatrix}$

Question Number : 66 Question Id : 41652914921 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 ways of choosing 10 objects out of 31 objects of which 10 are identical and the remaining 21 are distinct, is :

Options :

41652958462. $2^{20}-1$

41652958463. 2^{20}

41652958464. $2^{20}+1$

41652958465. 2^{21}

Question Number : 66 Question Id : 41652914921 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

31 वस्तुओं, जिनमें 10 समरूप (identical) हैं तथा 21 भिन्न हैं, में से 10 वस्तुओं के चुने जाने के तरीकों की संख्या है :

Options :

41652958462. $2^{20}-1$

41652958463. 2^{20}

41652958464. $2^{20}+1$

41652958465. 2^{21}

Question Number : 67 Question Id : 41652914922 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 coefficient of x^{18} in the product $(1+x)(1-x)^{10}(1+x+x^2)^9$ is :

Options :

41652958466. 84

41652958467. 126

41652958468. -126

41652958469. -84

Question Number : 67 Question Id : 41652914922 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

गुणनफल $(1+x)(1-x)^{10}(1+x+x^2)^9$ में x^{18} का गुणांक है :

Options :

41652958466. 84

41652958467. 126

41652958468. -126

41652958469. -84

Question Number : 68 Question Id : 41652914923 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 S_n denote the sum of the first n terms of an A.P.. If $S_4 = 16$ and $S_6 = -48$, then S_{10} is equal to :

Options :

41652958470. -260

41652958471. -320

41652958472. -380

41652958473. -410

Question Number : 68 Question Id : 41652914923 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 S_n एक समान्तर श्रेढ़ी के प्रथम n पदों के योग को दर्शाता है। यदि $S_4 = 16$ तथा $S_6 = -48$ है, तो S_{10} बराबर है :

Options :

41652958470. -260

41652958471. -320

41652958472. -380

41652958473. -410

Question Number : 69 Question Id : 41652914924 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

For $x \in \mathbf{R}$, let $[x]$ denote the greatest integer $\leq x$, then the sum of the series

$$\left[-\frac{1}{3}\right]+\left[-\frac{1}{3}-\frac{1}{100}\right]+\left[-\frac{1}{3}-\frac{2}{100}\right]+\cdots\cdots+\left[-\frac{1}{3}-\frac{99}{100}\right]$$

is :

Options :

41652958474. -135

41652958475. -153

41652958476. -131

41652958477. -133

Question Number : 69 Question Id : 41652914924 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$x \in \mathbf{R}$ के लिए माना $[x]$, x के समान या उससे कम महत्तम पूर्णांक को दर्शाता है, तो श्रेणी

$$\left[-\frac{1}{3}\right]+\left[-\frac{1}{3}-\frac{1}{100}\right]+\left[-\frac{1}{3}-\frac{2}{100}\right]+\cdots\cdots+\left[-\frac{1}{3}-\frac{99}{100}\right]$$

का योग है :

Options :

41652958474. -135

41652958475. -153

41652958476. -131

41652958477. -133

Question Number : 70 Question Id : 41652914925 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 a continuously differentiable function such that $f(2) = 6$ and $f'(2) = \frac{1}{48}$. If $\int_6^{f(x)} 4t^3 dt = (x-2)g(x)$, then $\lim\limits_{x \to 2} g(x)$ is equal to :

Options :

41652958478. 12

41652958479. 18

41652958480. 24

41652958481. 36

Question Number : 70 Question Id : 41652914925 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 $f : R \to R$ एक संततत: अवकलनीय (continuously differentiable) फलन इस प्रकार है कि $f(2)=6$ तथा $f'(2)=\frac{1}{48}$. यदि $\int_6^{f(x)} 4t^3 dt = (x-2)g(x)$, तो $\lim_{x\to 2} g(x)$ बराबर है :

Options :

41652958478. 12

41652958479. 18

41652958480. 24

41652958481. 36

Question Number : 71 Question Id : 41652914926 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 $e^y + xy = e$, the ordered pair $\left(\frac{dy}{dx}, \frac{d^2y}{dx^2}\right)$ at $x=0$ is equal to :

Options :

41652958482. $\left(-\frac{1}{e}, \frac{1}{e^2}\right)$

41652958483. $\left(\frac{1}{e}, -\frac{1}{e^2}\right)$

41652958484. $\left(\frac{1}{e}, \frac{1}{e^2}\right)$

41652958485. $\left(-\frac{1}{e}, -\frac{1}{e^2}\right)$

Question Number : 71 Question Id : 41652914926 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 $e^y + xy = e$, तो $x = 0$ पर क्रमित युग्म $\left(\frac{dy}{dx}, \frac{d^2y}{dx^2}\right)$ बराबर है :

Options :

41652958482. $\left(-\frac{1}{e}, \frac{1}{e^2}\right)$

41652958483. $\left(\frac{1}{e}, -\frac{1}{e^2}\right)$

41652958484. $\left(\frac{1}{e}, \frac{1}{e^2}\right)$

41652958485. $\left(-\frac{1}{e}, -\frac{1}{e^2}\right)$

Question Number : 72 Question Id : 41652914927 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 2 m ladder leans against a vertical wall. If the top of the ladder begins to slide down the wall at the rate 25 cm/sec., then the rate (in cm/sec.) at which the bottom of the ladder slides away from the wall on the horizontal ground when the top of the ladder is 1 m above the ground is :

Options :

41652958486. $\frac{25}{3}$

41652958487. $\frac{25}{\sqrt{3}}$

41652958488. 25

41652958489. $25\sqrt{3}$

Question Number : 72 Question Id : 41652914927 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 मीटर लम्बी एक सीढ़ी एक ऊर्ध्वाधर दीवार के साथ झुकी हुई है। यदि सीढ़ी का शिखर 25 cm/sec. की दर से दीवार के साथ नीचे की ओर फिसलना शुरू करता है, तो वह दर (cm/sec में), जिस से सीढ़ी का पाद, क्षैतिज धरातल पर, दीवार से दूर फिसलता है जब सीढ़ी का शिखर धरातल से 1 मीटर की ऊँचाई पर है, है :

Options :

41652958486. $\frac{25}{3}$

41652958487. $\frac{25}{\sqrt{3}}$

41652958488. 25

41652958489. $25\sqrt{3}$

Question Number : 73 Question Id : 41652914928 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 m is the minimum value of k for which the function $f(x) = x\sqrt{kx - x^2}$ is increasing in the interval $[0, 3]$ and M is the maximum value of f in $[0, 3]$ when $k = m$, then the ordered pair (m, M) is equal to :

Options :

41652958490. $(4, 3\sqrt{2})$

41652958491. $(5, 3\sqrt{6})$

41652958492. $(4, 3\sqrt{3})$

41652958493. $(3, 3\sqrt{3})$

Question Number : 73 Question Id : 41652914928 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 k का न्यूनतम मान, जिसके लिए फलन $f(x) = x\sqrt{kx - x^2}$ अंतराल $[0, 3]$ में वर्धमान है, m है तथा $[0, 3]$ में f का अधिकतम मान जब $k = m$ है, M है, तो क्रमित युग्म (m, M) बराबर है :

Options :

41652958490. $(4, 3\sqrt{2})$

41652958491. $(5, 3\sqrt{6})$

41652958492. $(4, 3\sqrt{3})$

41652958493. $(3, 3\sqrt{3})$

Question Number : 74 Question Id : 41652914929 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 integral $\int \frac{2x^3 - 1}{x^4 + x}\,dx$ is equal to :

(Here C is a constant of integration)

Options :

41652958494. $\log_e \left|\frac{x^3 + 1}{x}\right| + C$

41652958495. $\frac{1}{2}\log_e \frac{(x^3 + 1)^2}{|x^3|} + C$

41652958496. $\log_e \frac{|x^3 + 1|}{x^2} + C$

41652958497. $\frac{1}{2}\log_e\frac{|x^3+1|}{x^2}+C$

Question Number : 74 Question Id : 41652914929 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समाकल $\int\frac{2x^3-1}{x^4+x}dx$ बराबर है :

(यहाँ C समाकलन अचर है)

Options :

41652958494. $\log_e\left|\frac{x^3+1}{x}\right|+C$

41652958495. $\frac{1}{2}\log_e\frac{(x^3+1)^2}{|x^3|}+C$

41652958496. $\log_e\frac{|x^3+1|}{x^2}+C$

41652958497. $\frac{1}{2}\log_e\frac{|x^3+1|}{x^2}+C$

Question Number : 75 Question Id : 41652914930 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 $\int_0^{\frac{\pi}{2}}\frac{\cot x}{\cot x+\operatorname{cosec}x}dx=m(\pi+n)$, then

$m\cdot n$ is equal to :

Options :

41652958498. 1

41652958499. -1

41652958500. $\frac{1}{2}$

41652958501. $-\frac{1}{2}$

Question Number : 75 Question Id : 41652914930 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 $\int_0^{\frac{\pi}{2}} \frac{\cot x}{\cot x + \operatorname{cosec} x}\, dx = m(\pi + n)$, तो

$m \cdot n$ बराबर है :

Options :

41652958498. 1

41652958499. -1

41652958500. $\frac{1}{2}$

41652958501. $-\frac{1}{2}$

Question Number : 76 Question Id : 41652914931 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 area (in sq. units) of the region $\{(x, y) : y^2 \le 4x,\ x+y \le 1,\ x \ge 0,\ y \ge 0\}$ is $a\sqrt{2} + b$, then $a - b$ is equal to :

Options :

41652958502. $\frac{8}{3}$

41652958503. 6

41652958504. $\frac{10}{3}$

41652958505. $-\frac{2}{3}$

Question Number : 76 Question Id : 41652914931 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 क्षेत्र

$\{(x, y) : y^2 \le 4x,\ x+y \le 1,\ x \ge 0,\ y \ge 0\}$ का

क्षेत्रफल (वर्ग इकाइयों में) $a\sqrt{2} + b$ है, तो $a - b$

बराबर है :

Options :

41652958502. $\frac{8}{3}$

41652958503. 6

41652958504. $\frac{10}{3}$

41652958505. $-\frac{2}{3}$

Question Number : 77 Question Id : 41652914932 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 differential equation, $y^2dx+\left(x-\frac{1}{y}\right)dy=0$. If value of y is 1 when $x=1$, then the value of x for which $y=2$, is :

Options :

41652958506. $\frac{3}{2}-\sqrt{e}$

41652958507. $\frac{5}{2}+\frac{1}{\sqrt{e}}$

41652958508. $\frac{3}{2}-\frac{1}{\sqrt{e}}$

41652958509. $\frac{1}{2}+\frac{1}{\sqrt{e}}$

Question Number : 77 Question Id : 41652914932 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अवकल समीकरण $y^2dx+\left(x-\frac{1}{y}\right)dy=0$ पर विचार कीजिए। यदि $x=1$ पर y का मान 1 है, तो x का मान, जिसके लिए $y=2$ है, है :

Options :

41652958506. $\frac{3}{2}-\sqrt{e}$

41652958507. $\frac{5}{2}+\frac{1}{\sqrt{e}}$

41652958508. $\frac{3}{2}-\frac{1}{\sqrt{e}}$

41652958509. $\frac{1}{2}+\frac{1}{\sqrt{e}}$

Question Number : 78 Question Id : 41652914933 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 equation $y=\sin x\sin(x+2)-\sin^2(x+1)$ represents a straight line lying in :

Options :

41652958510. first, second and fourth quadrants

41652958511. second and third quadrants only

41652958512. third and fourth quadrants only

41652958513. first, third and fourth quadrants

Question Number : 78 Question Id : 41652914933 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समीकरण $y=\sin x\ \sin(x+2)-\sin^2(x+1)$ एक सरल रेखा को निरूपित करता है, जो स्थित है :

Options :

41652958510. पहले, दूसरे तथा चौथे चतुर्थांश में।

41652958511. मात्र दूसरे तथा तीसरे चतुर्थांश में।

41652958512. मात्र तीसरे तथा चौथे चतुर्थांश में।

41652958513. पहले, तीसरे तथा चौथे चतुर्थांश में।

Question Number : 79 Question Id : 41652914934 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 angle of intersection at a point where the two circles with radii 5 cm and 12 cm intersect is 90°, then the length (in cm) of their common chord is :

Options :

41652958514. $\frac{120}{13}$

41652958515. $\frac{13}{2}$

41652958516. $\frac{60}{13}$

41652958517. $\frac{13}{5}$

Question Number : 79 Question Id : 41652914934 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 एक बिन्दु, जहाँ 5 cm तथा 12 cm त्रिज्या के दो वृत्त एक दूसरे को काटते हैं, पर प्रतिच्छेदन कोण 90° है, तो उनकी उभयनिष्ठ जीवा की लम्बाई (cm में) है :

Options :

41652958514. $\frac{120}{13}$

41652958515. $\frac{13}{2}$

41652958516. $\frac{60}{13}$

41652958517. $\frac{13}{5}$

Question Number : 80 Question Id : 41652914935 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 normal to the ellipse $3x^2+4y^2=12$ at a point P on it is parallel to the line, $2x+y=4$ and the tangent to the ellipse at P passes through Q(4, 4) then PQ is equal to :

Options :

41652958518. $\frac{5\sqrt{5}}{2}$

41652958519. $\frac{\sqrt{157}}{2}$

41652958520. $\frac{\sqrt{61}}{2}$

41652958521. $\frac{\sqrt{221}}{2}$

Question Number : 80 Question Id : 41652914935 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 दीर्घवृत्त $3x^2+4y^2=12$ के एक बिन्दु P पर अभिलम्ब, रेखा $2x+y=4$ के समान्तर है तथा P पर दीर्घवृत्त की स्पर्श रेखा Q(4, 4) से होकर जाती है, तो PQ बराबर है :

Options :

41652958518. $\frac{5\sqrt{5}}{2}$

41652958519. $\frac{\sqrt{157}}{2}$

41652958520. $\frac{\sqrt{61}}{2}$

41652958521. $\frac{\sqrt{221}}{2}$

Question Number : 81 Question Id : 41652914936 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 P be the point of intersection of the common tangents to the parabola $y^2=12x$ and the hyperbola $8x^2-y^2=8$. If S and S' denote the foci of the hyperbola where S lies on the positive x-axis then P divides SS' in a ratio :

Options :

41652958522. $14:13$

41652958523. $13:11$

41652958524. $5:4$

41652958525. $2:1$

Question Number : 81 Question Id : 41652914936 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 परवलय $y^2=12x$ तथा अतिपरवलय $8x^2-y^2=8$ की उभयनिष्ठ स्पर्श रेखाओं का प्रतिच्छेदन बिन्दु P है। यदि S तथा S' अतिपरवलय की नाभियाँ हैं, जहाँ S धनात्मक x-अक्ष पर स्थित है, तो P, SS' को निम्न में से किस अनुपात में विभाजित करता है?

Options :

41652958522. $14:13$

41652958523. $13:11$

41652958524. $5:4$

41652958525. $2:1$

Question Number : 82 Question Id : 41652914937 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 $\frac{x-2}{3}=\frac{y+1}{2}=\frac{z-1}{-1}$ intersects the plane $2x+3y-z+13=0$ at a point P and the plane $3x+y+4z=16$ at a point Q, then PQ is equal to :

Options :

41652958526. $\sqrt{14}$

41652958527. $2\sqrt{14}$

41652958528. 14

41652958529. $2\sqrt{7}$

Question Number : 82 Question Id : 41652914937 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 $\frac{x-2}{3}=\frac{y+1}{2}=\frac{z-1}{-1}$, समतल $2x+3y-z+13=0$ को बिन्दु P पर काटती है तथा समतल $3x+y+4z=16$ को बिन्दु Q पर काटती है, तो PQ बराबर है :

Options :

41652958526. $\sqrt{14}$

41652958527. $2\sqrt{14}$

41652958528. 14

41652958529. $2\sqrt{7}$

Question Number : 83 Question Id : 41652914938 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 volume of parallelopiped formed by the vectors $\hat{i}+\lambda\hat{j}+\hat{k}$, $\hat{j}+\lambda\hat{k}$ and $\lambda\hat{i}+\hat{k}$ is minimum, then λ is equal to :

Options :

41652958530. $-\frac{1}{\sqrt{3}}$

41652958531. $-\sqrt{3}$

41652958532. $\frac{1}{\sqrt{3}}$

41652958533. $\sqrt{3}$

Question Number : 83 Question Id : 41652914938 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 सदिशों $\hat{i} + \lambda\hat{j} + \hat{k}$, $\hat{j} + \lambda\hat{k}$ तथा $\lambda\hat{i} + \hat{k}$ द्वारा बनाये गये समान्तर षट्फलक (parallelopiped) का आयतन न्यूनतम है, तो λ बराबर है :

Options :

41652958530. $-\frac{1}{\sqrt{3}}$

41652958531. $-\sqrt{3}$

41652958532. $\frac{1}{\sqrt{3}}$

41652958533. $\sqrt{3}$

Question Number : 84 Question Id : 41652914939 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 $\vec{a} = 3\hat{i} + 2\hat{j} + 2\hat{k}$ and $\vec{b} = \hat{i} + 2\hat{j} - 2\hat{k}$ be two vectors. If a vector perpendicular to both the vectors $\vec{a} + \vec{b}$ and $\vec{a} - \vec{b}$ has the magnitude 12 then one such vector is :

Options :

41652958534. $4\left(2\hat{i} + 2\hat{j} + \hat{k}\right)$

41652958535. $4\left(2\hat{i} + 2\hat{j} - \hat{k}\right)$

41652958536. $4\left(2\hat{i}-2\hat{j}-\hat{k}\right)$

41652958537. $4\left(-2\hat{i}-2\hat{j}+\hat{k}\right)$

Question Number : 84 Question Id : 41652914939 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 $\vec{a}=3\hat{i}+2\hat{j}+2\hat{k}$ तथा $\vec{b}=\hat{i}+2\hat{j}-2\hat{k}$ दो सदिश हैं। यदि दोनों सदिशों $\vec{a}+\vec{b}$ तथा $\vec{a}-\vec{b}$ के लम्बवत एक सदिश का परिमाण 12 है, तो एक ऐसा सदिश है :

Options :

41652958534. $4\left(2\hat{i}+2\hat{j}+\hat{k}\right)$

41652958535. $4\left(2\hat{i}+2\hat{j}-\hat{k}\right)$

41652958536. $4\left(2\hat{i}-2\hat{j}-\hat{k}\right)$

41652958537. $4\left(-2\hat{i}-2\hat{j}+\hat{k}\right)$

Question Number : 85 Question Id : 41652914940 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 random variable X have a binomial distribution with mean 8 and variance 4.

If $P(X \le 2)=\frac{k}{2^{16}}$, then k is equal to :

Options :

41652958538. 1

41652958539. 17

41652958540. 121

41652958541. 137

Question Number : 85 Question Id : 41652914940 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 यादृच्छिक चर X के द्विपद बंटन का माध्य 8 तथा प्रसरण 4 है। यदि $P(X \leq 2) = \frac{k}{2^{16}}$ है, तो k बराबर है :

Options :

41652958538. 1

41652958539. 17

41652958540. 121

41652958541. 137

Question Number : 86 Question Id : 41652914941 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 three of the six vertices of a regular hexagon are chosen at random, then the probability that the triangle formed with these chosen vertices is equilateral is :

Options :

41652958542. $\frac{1}{10}$

41652958543. $\frac{1}{5}$

41652958544. $\frac{3}{10}$

41652958545. $\frac{3}{20}$

Question Number : 86 Question Id : 41652914941 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 एक नियमित षड्भुज के छः शीर्षों में से तीन यादृच्छिक चुने जाते हैं, तो इन चुने गए शीर्षों द्वारा बने त्रिभुज के समबाहु होने की प्रायिकता है :

Options :

41652958542. $\frac{1}{10}$

41652958543. $\frac{1}{5}$

41652958544. $\frac{3}{10}$

41652958545. $\frac{3}{20}$

Question Number : 87 Question Id : 41652914942 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 data $x_1, x_2, ..., x_{10}$ is such that the mean of first four of these is 11, the mean of the remaining six is 16 and the sum of squares of all of these is 2,000 ; then the standard deviation of this data is :

Options :

41652958546. 4

41652958547. 2

41652958548. $2\sqrt{2}$

41652958549. $\sqrt{2}$

Question Number : 87 Question Id : 41652914942 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 आँकड़ें $x_1, x_2, ..., x_{10}$ इस प्रकार हैं कि इनमें से प्रथम चार का माध्य 11 है, बाकी छः का माध्य 16 है तथा इन सभी के वर्गों का योग 2,000 है, तो इन आँकड़ों का मानक विचलन है :

Options :

41652958546. 4

41652958547. 2

41652958548. $2\sqrt{2}$

41652958549. $\sqrt{2}$

Question Number : 88 Question Id : 41652914943 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 solutions of the equation

$1+\sin^4 x=\cos^2 3x,\ x \in \left[-\frac{5\pi}{2}, \frac{5\pi}{2}\right]$ is :

Options :

41652958550. 7

41652958551. 3

41652958552. 4

41652958553. 5

Question Number : 88 Question Id : 41652914943 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समीकरण $1+\sin^4 x=\cos^2 3x$,

$x \in \left[-\frac{5\pi}{2}, \frac{5\pi}{2}\right]$ के हलों की संख्या है :

Options :

41652958550. 7

41652958551. 3

41652958552. 4

41652958553. 5

Question Number : 89 Question Id : 41652914944 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 $\sin^{-1}\left(\frac{12}{13}\right) - \sin^{-1}\left(\frac{3}{5}\right)$ is

equal to :

Options :

41652958554. $\frac{\pi}{2} - \cos^{-1}\left(\frac{9}{65}\right)$

41652958555. $\pi - \sin^{-1}\left(\frac{63}{65}\right)$

41652958556. $\pi - \cos^{-1}\left(\frac{33}{65}\right)$

41652958557. $\frac{\pi}{2} - \sin^{-1}\left(\frac{56}{65}\right)$

Question Number : 89 Question Id : 41652914944 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$\sin^{-1}\left(\frac{12}{13}\right) - \sin^{-1}\left(\frac{3}{5}\right)$ का मान है :

Options :

41652958554. $\frac{\pi}{2} - \cos^{-1}\left(\frac{9}{65}\right)$

41652958555. $\pi - \sin^{-1}\left(\frac{63}{65}\right)$

41652958556. $\pi - \cos^{-1}\left(\frac{33}{65}\right)$

41652958557. $\frac{\pi}{2} - \sin^{-1}\left(\frac{56}{65}\right)$

Question Number : 90 Question Id : 41652914945 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 truth value of the statement $p \rightarrow (\sim q \vee r)$ is false(F), then the truth values of the statements p, q, r are respectively :

Options :

41652958558. T, T, F

41652958559. T, F, T

41652958560. T, F, F

41652958561. F, T, T

Question Number : 90 Question Id : 41652914945 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 कथन $p \rightarrow (\sim q \vee r)$ का सत्य मान असत्य(F)

है, तो कथनों p, q, r के सत्यमान क्रमशः हैं :

Options :

41652958558. T, T, F

41652958559. T, F, T

41652958560. T, F, F

41652958561. F, T, T