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CSIR NET NOVEMBER 26, 2020 CHEMICAL SCIENCES QUESTION PAPER

National Testing Agency

Question Paper Name :	Chemical Sciences 26th Nov 2020 Shift 1
Subject Name :	Chemical Sciences
Creation Date :	2020-11-26 17:43:39
Duration :	180
Number of Questions :	120
Total Marks :	200
Display Marks:	Yes

Chemical Sciences

Group Number :	1
Group Id :	8024373
Group Maximum Duration :	0
Group Minimum Duration :	180
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	200
Is this Group for Examiner? :	No

Part A Chemical Sciences

Section Id :	8024377
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	15

Section Marks :	30
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	80243711
Question Shuffling Allowed :	Yes

Question Number : 1 Question Id : 802437226 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

Four identical cones with base diameter of 10 cm are compactly placed inside a box in upright position. What will be the area of square (in cm^2) formed by connecting tips of the cones?

Options :

802437901. 400

802437902. 144

802437903. 100

802437904. 25

Question Number : 1 Question Id : 802437226 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

चार समरूप शंकु जिनके आधार का व्यास 10 सेमी है, संहत रूप में खड़ी स्थिति में एक बॉक्स में रखे गए हैं। शंकुओं की नोकों को जोड़ते हुए बनने वाले वर्ग का क्षेत्रफल (सेमी^{2} में) कितना होगा ?

Options :

802437901. 400

802437902. 144

802437903. 100

802437904. 25

Question Number : 2 Question Id : 802437227 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

How many hollow spheres having inner radius of 1 cm can be completely filled by transferring water from a completely filled hollow sphere having inner diameter of 20 cm?

Options :

802437905. 400

802437906. 100

802437907. 1000

802437908. 8000

Question Number : 2 Question Id : 802437227 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

पूरे भरे हुए 20 सेमी आंतरिक व्यास वाले खोखले गोले से पानी 1 सेमी आंतरिक व्यास वाले खोखले गोलों में अंतरित करने से कितने गोले पूरे भरे जा सकते हैं ?

Options :

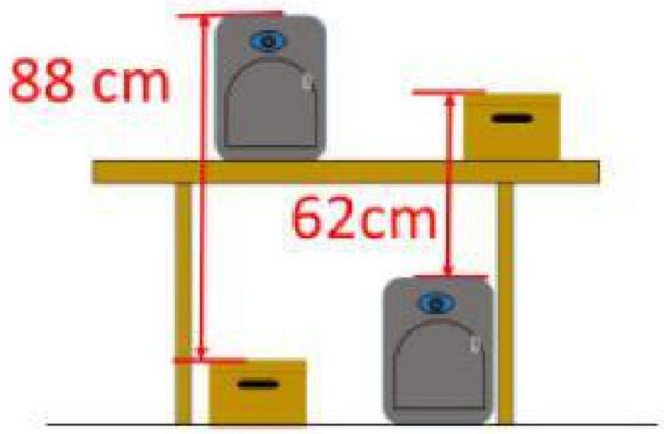
802437905. 400

802437906. 100

802437907. 1000

802437908. 8000

Question Number : 3 Question Id : 802437228 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5



Drawing not to the scale

The two identical bags and two identical boxes are placed as shown. The top of the table is at the height of

Options :

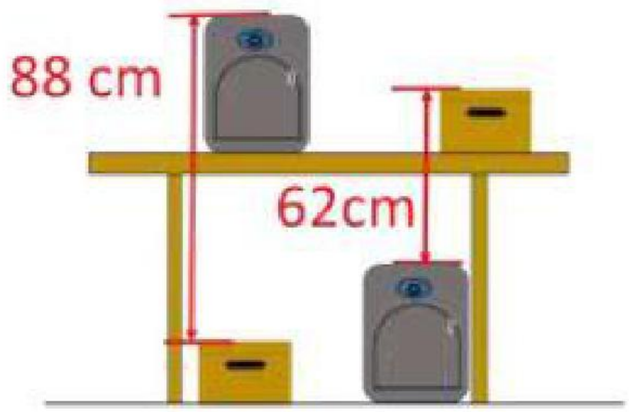
802437909. 65 cm

802437910. 70 cm

802437911. 75 cm

802437912. 80 cm

Question Number : 3 Question Id : 802437228 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5



Drawing not to the scale

दो समरूप बैग और दो समरूप पेटियाँ चित्र में दिखाए गए अनुसार रखे गए हैं।
मेज की ऊपरी सतह की ऊँचाई .... है।

Options :

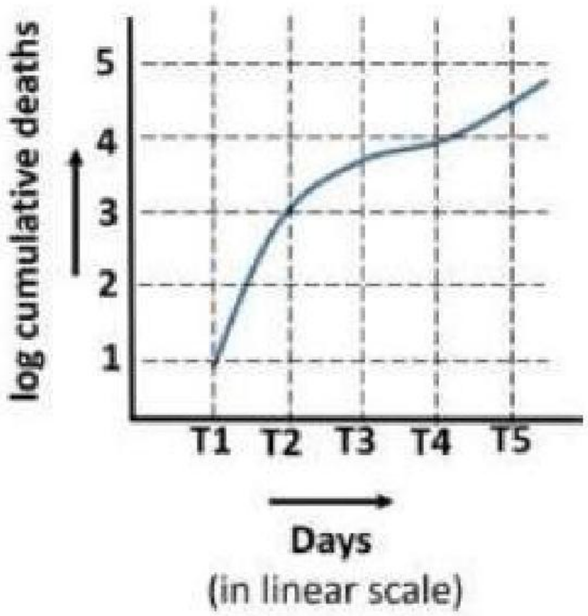
802437909. 65 सेमी

802437910. 70 सेमी

802437911. 75 सेमी

802437912. 80 सेमी

Question Number : 4 Question Id : 802437229 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5



The above graph shows the cumulative number of deaths during a pandemic. The time intervals shown in the graph are equal. The largest increase in the number of deaths was during the period

Options :

802437913. T1 to T2

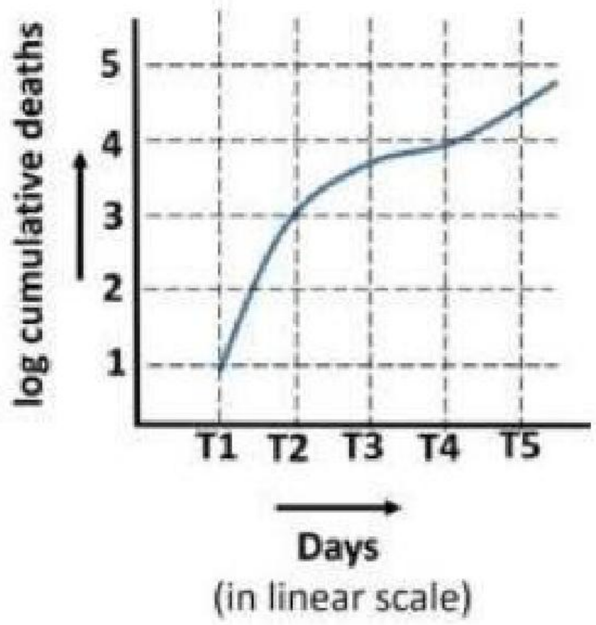
802437914. T2 to T3

802437915. T3 to T4

802437916. T4 to T5

Question Number : 4 Question Id : 802437229 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 2 Wrong Marks : 0.5



दिए गए ग्राफ़ में महामारी के दौरान मौतों की संचयी संख्या को दर्शाया गया है। ग्राफ़ में दर्शाये गये समय का अंतराल समान है। मौतों की अधिकम वृद्धि किस अवधि में थी ?

Options :

802437913. T1 से T2

802437914. T2 से T3

802437915. T3 से T4

802437916. T4 से T5

Question Number : 5 Question Id : 802437230 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The period of a pendulum is given as $T = 2\pi (l/g)^{1/2}$ where $g = 9.81\ m/s^2$ and $\pi = 3.1416$. The period of a pendulum of length 1 m correct to the first place of decimal in seconds is

Options :

802437917. 1.8

802437918. 1.9

802437919. 2.0

802437920. 2.1

Question Number : 5 Question Id : 802437230 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

लोलक का दोलन काल $T = 2\pi (l/g)^{1/2}$ के रूप में दिया गया है, जिसमें $g = 9.81\ m/s^2$ तथा $\pi = 3.1416$. 1 मी लंबाई वाले लोलक का दशमलव के प्रथम स्थान तक सही दोलन काल सेकेंड्स में.....है।

Options :

802437917. 1.8

802437918. 1.9

802437919. 2.0

802437920. 2.1

Question Number : 6 Question Id : 802437231 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The sides a, b and c of a ΔABC satisfy the equation $(a-8)^2 + (b-15)^2 + (c-17)^2 = 0$. Then ΔABC is

Options :

802437921. equilateral

802437922. right-angled

802437923. isosceles

802437924. obtuse angled triangle

Question Number : 6 Question Id : 802437231 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

ΔABC की भुजाएं a, b एवं c हैं जो समीकरण

$(a-8)^2 + (b-15)^2 + (c-17)^2 = 0$ को संतुष्ट करती हैं। तब ΔABC है

Options :

802437921. समबाहु

802437922. लंबकोणीय

802437923. समद्विबाहु

802437924. अधिकोणीय त्रिभुज

Question Number : 7 Question Id : 802437232 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

In the given subtraction problem, each letter represents a digit between 0 and 9.

	T	A	S	5
–		R	S	R
	2	T	A	9

The values of R, A and T are, respectively

Options :

802437925. 6, 9, 3

802437926. 4, 8, 3

802437927. 6, 9, 2

802437928. 4, 2, 9

Question Number : 7 Question Id : 802437232 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

दिए गए व्यवकलन प्रश्न में प्रत्येक अक्षर 0 एवं 9 के बीच एक अंक का प्रतिनिधित्व करते हैं।

	T	A	S	5
–		R	S	R
	2	T	A	9

R, A तथा T के मान हैं, क्रमशः

Options :

802437925. 6, 9, 3

802437926. 4, 8, 3

802437927. 6, 9, 2

802437928. 4, 2, 9

Question Number : 8 Question Id : 802437233 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

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Three apartments, which are in a row, are occupied by Umar, Ramesh and John. Only one of them is the landlord, whose apartment is at one end. Ramesh's apartment is not next to John's apartment. The apartment on the left is not the landlord's, the one in the middle is not Ramesh's and the one on the right is not John's. Who is the landlord?

Options :

802437929. Umar

802437930. Ramesh

802437931. John

802437932. The above information is insufficient to identify the landlord.

Question Number : 8 Question Id : 802437233 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

तीन अपार्टमेंट एक ही कतार में हैं, जिनमें उमर, रमेश और जॉन रहते हैं। इनमें से एक ही मकान-मालिक है, जिसका अपार्टमेंट एक कोने में है। रमेश का अपार्टमेंट जॉन के अपार्टमेंट के साथ नहीं है। बाईं तरफ वाला अपार्टमेंट मकान-मालिक का नहीं है, जो मध्य में है, वह रमेश का नहीं है और दाईं तरफ़ जो है, वह जॉन का नहीं है। मकान-मालिक कौन है ?

Options :

802437929. उमर

802437930. रमेश

802437931. जॉन

802437932. मकान-मालिक को पहचानने के लिए ऊपर दी गई सूचना अधूरी है।

Question Number : 9 Question Id : 802437234 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

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At a book-signing session, there are 5 authors who write only single-author books and another 5 who write only in pairs. Every author signs books that are authored or co-authored by him/her. In order to collect signatures of all 10 authors, in the best possible scenario, the minimum number of books that need to be purchased is

Options :

802437933. 5

802437934. 6

802437935. 8

802437936. 10

Question Number : 9 Question Id : 802437234 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

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एक पुस्तक-हस्ताक्षर सत्र में, 5 लेखक ऐसे हैं जिनकी पुस्तकों के वे एकमात्र लेखक हैं और अन्य 5 जोड़ी में सहलेखक हैं। हर लेखक अपने द्वारा अथवा अपने सह लेखन में लिखी गई पुस्तक पर हस्ताक्षर करते / करती हैं। सभी लेखकों से हस्ताक्षर प्राप्त करने के क्रम में, सबसे बेहतर स्थिति में, खरीदी जाने वाली पुस्तकों की न्यूनतम संख्या.... है।

Options :

802437933. 5

802437934. 6

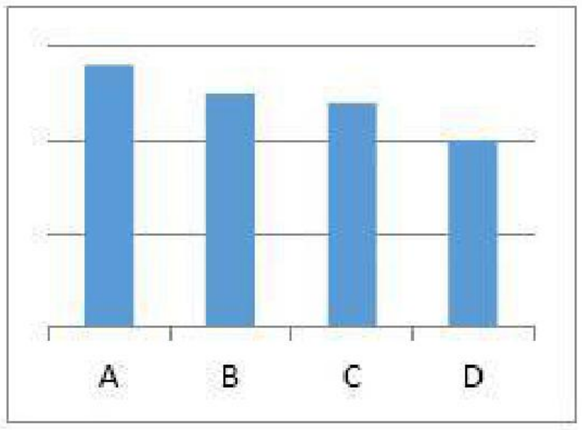
802437935. 8

802437936. 10

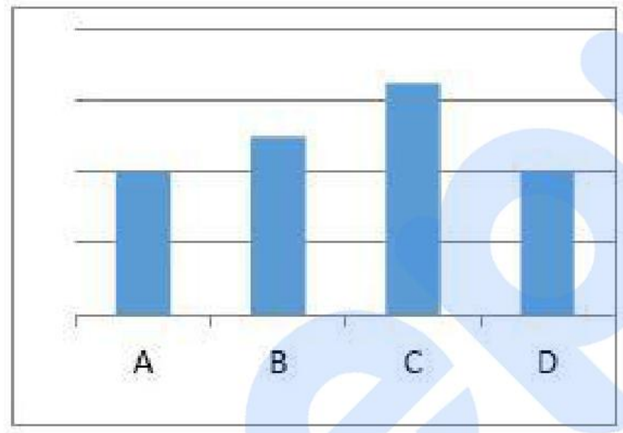
Question Number : 10 Question Id : 802437235 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The gross domestic products (GDP) and total populations of four countries A, B, C and D in appropriate units are shown in the accompanying figures.

GDP



POPULATION



Countries with the highest and the lowest per capita GDP are, respectively

Options :

802437937. A and C

802437938. A and D

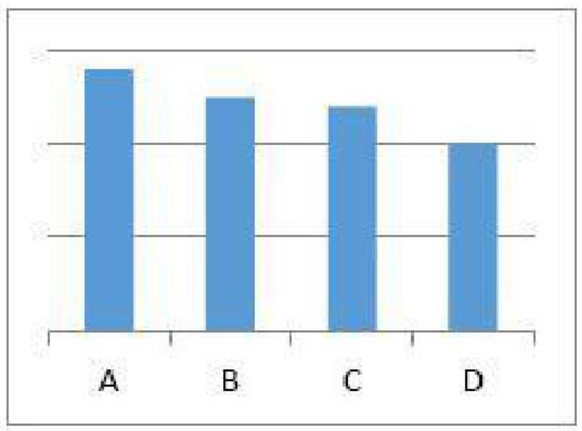
802437939. C and D

802437940. C and B

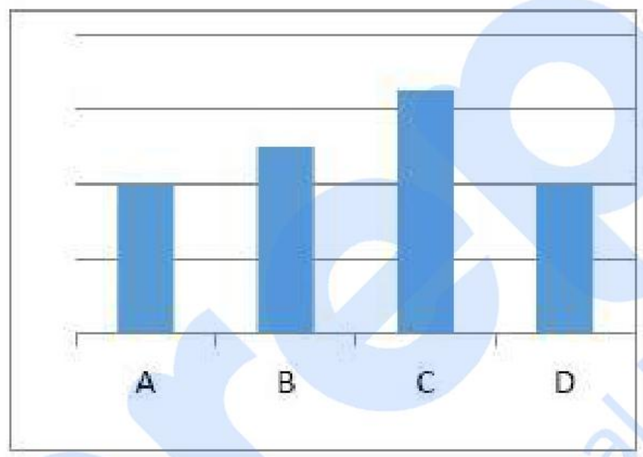
Question Number : 10 Question Id : 802437235 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

चार देश A, B, C एवं D के सकल घरेलू उत्पाद तथा पूरी जनसंख्या, उचित इकाइयों में, दिए गए चित्रों में दर्शाए गए हैं।

GDP



POPULATION



अधिकतम एवं न्यनतम प्रति व्यक्ति सकल घरेलू उत्पाद वाले देश, क्रमशः

Options :

802437937. A एवं C

802437938. A एवं D

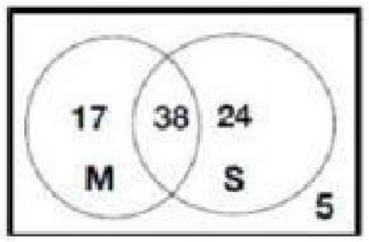
802437939. C एवं D

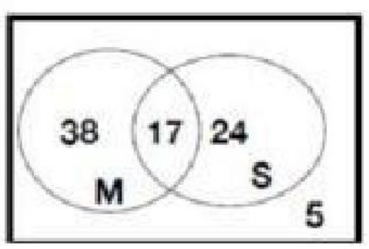
802437940. C एवं B

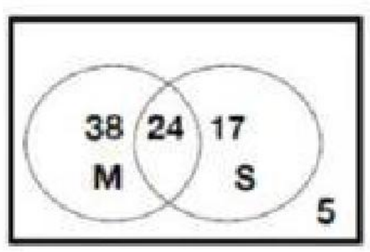
Question Number : 11 Question Id : 802437236 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

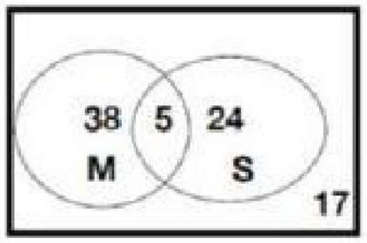
In a class of 84 students, 29 failed in Science (S), 43 failed in Maths (M) and 17 students passed in both. Which of the following Venn diagrams is the correct depiction of the situation?

Options :

802437941. 

802437942. 

802437943. 

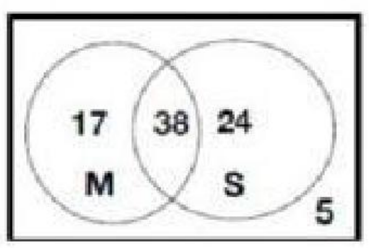


802437944.

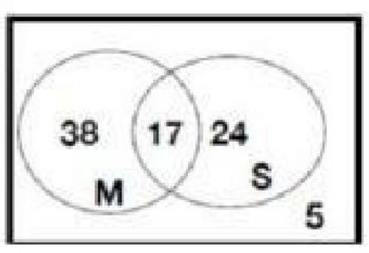
Question Number : 11 Question Id : 802437236 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

एक कक्षा के 84 विद्यार्थियों में से 29 विज्ञान (S) में अनुत्तीर्ण हुए, 43 गणित (M) में अनुत्तीर्ण हुए तथा 17 विद्यार्थी दोनों विषयों में उत्तीर्ण हुए। निम्न में से कौन-सा वेन-चित्र (Venn-Diagram) इस स्थिति को सही रूप से दर्शाता है?

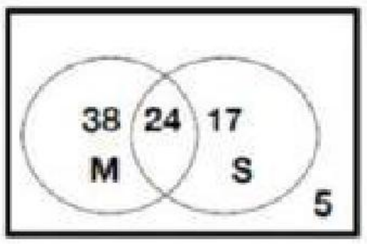
Options :

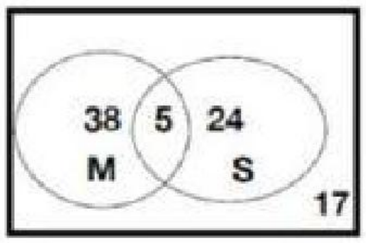


802437941.



802437942.

802437943. 

802437944. 

Question Number : 12 Question Id : 802437237 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

A milk vendor has 50 L of milk and supplies 5 L to every customer. After each transaction he adds 5L of water. What is the percentage of milk contained in a litre of solution purchased by the fifth customer?

Options :

802437945. 65.6%

802437946. 72.9%

802437947. 83.1%

802437948. 59.4%

Question Number : 12 Question Id : 802437237 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

एक दूध विक्रेता के पास 50 ली. दूध है, जिसमें से वह 5 लीटर प्रत्येक ग्राहक को देता है। प्रत्येक विनिमय के पश्चात् वह 5 लीटर पानी मिलाता है। 5 वें ग्राहक द्वारा खरीदे जाने वाले विलयन में दूध का प्रतिशत कितना है?

Options :

802437945. 65.6%

802437946. 72.9%

802437947. 83.1%

802437948. 59.4%

Question Number : 13 Question Id : 802437238 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

An expenditure of Rs. 96 was supposed to be shared equally by all the students in a class. Since four students didn't contribute, the remaining students had to contribute an additional amount of Rs. 4, each. How many students contributed?

Options :

802437949. 8

802437950. 12

802437951. 16

802437952. 24

Question Number : 13 Question Id : 802437238 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

एक कक्षा के सभी विद्यार्थियों को व्यय की गई 96 रुपए की राशि में बराबर का योगदान देना था। चूँकि 4 विद्यार्थियों ने अपना योगदान नहीं दिया, बचे हुए विद्यार्थियों में से प्रत्येक को 4 रुपए अतिरिक्त देने पड़े। कुल कितने विद्यार्थियों ने योगदान दिया?

Options :

802437949. 8

802437950. 12

802437951. 16

802437952. 24

Question Number : 14 Question Id : 802437239 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

While calculating the average of twenty 2-digit numbers, digits of one of the numbers got interchanged because of which the average reduced by 1.8. The difference in the values of the digits of the number that were interchanged is

Options :

802437953. 1

802437954. 2

802437955. 3

802437956. 4

Question Number : 14 Question Id : 802437239 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

दो अंकों की बीस संख्याओं के औसत की गणना करते समय एक संख्या के अंकों की अदला-बदली हो जाने से औसत में 1.8 की कमी हुई। अदल-बदल हो जाने वाले अंकों के मानों में अंतर ... है।

Options :

802437953. 1

802437954. 2

802437955. 3

802437956. 4

Question Number : 15 Question Id : 802437240 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

Based on the clues given in statements A to D, find the correct 3-digit number.

A. Two of the digits are present in the number 395, but they are not placed correctly.
B. One of the digits is present in the number 718 and is placed correctly.
C. None of the digits is present in the number 148.
D. One of the digits is present in the number 835 and is placed correctly.

Options :

802437957. 739

802437958. 735

802437959. 379

802437960. 359

Question Number : 15 Question Id : 802437240 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

कथन 'A' से 'D' में दिए गए संकेतों के आधार पर तीन अंकों की सही संख्या पहचानें।

A. दो अंक संख्या 395 में उपस्थित है, परंतु वे अपने सही स्थान पर नहीं हैं।

B. एक अंक संख्या 718 में उपस्थित है, और वह अपने सही स्थान पर है।

C. कोई भी अंक संख्या 148 में उपस्थित नहीं है।

D. एक अंक संख्या 835 में उपस्थित है, और अपने सही स्थान पर है।

Options :

802437957. 739

802437958. 735

802437959. 379

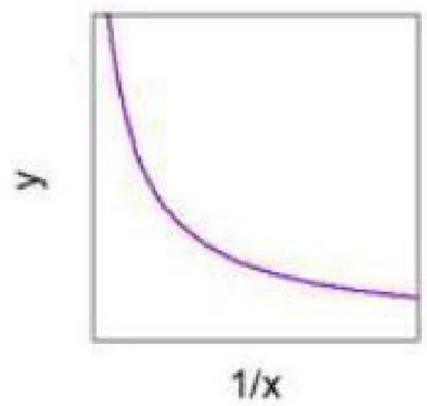
802437960.

Question Number : 16 Question Id : 802437241 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

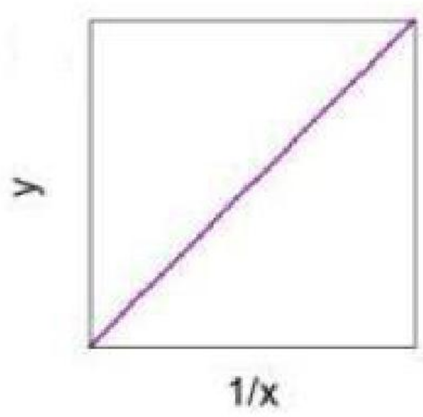
Which of the following plots represents the function **y= x**?

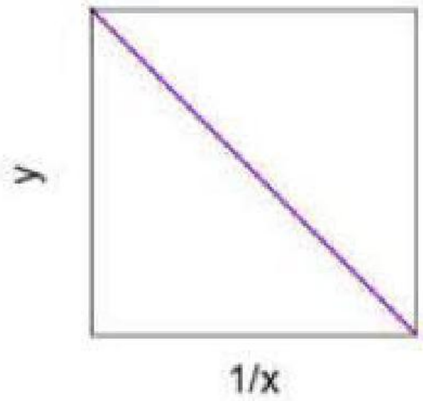
Options :

802437961.

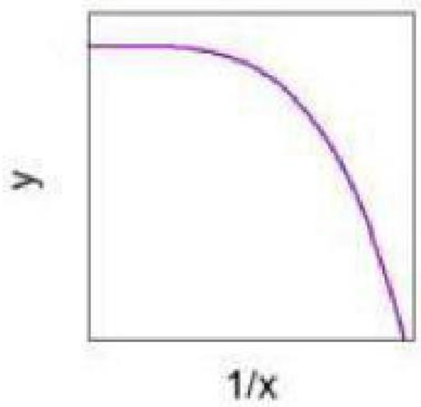


802437962.





802437963.

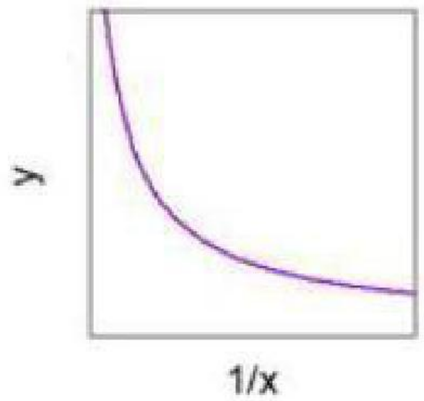


802437964.

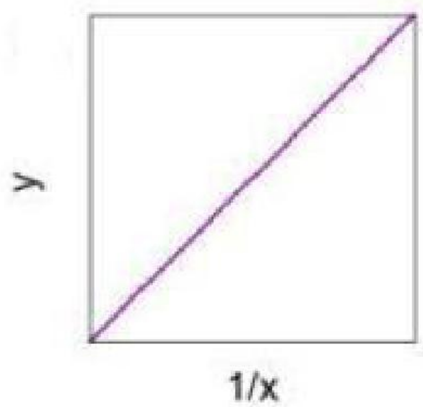
Question Number : 16 Question Id : 802437241 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

निम्नांकित में से कौन-सा प्लॉट फलन y= x को दर्शाता है?

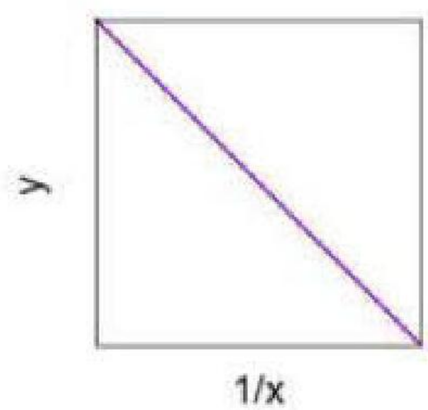
Options :



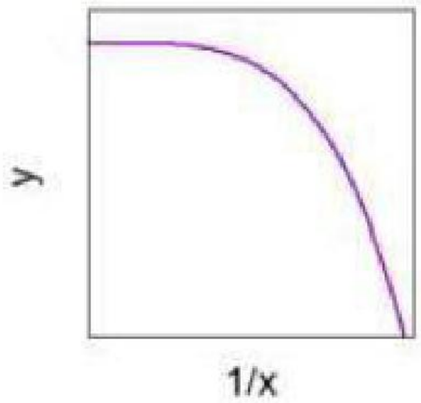
802437961.



802437962.



802437963.



802437964.

Question Number : 17 Question Id : 802437242 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

1% of the population of a country is suffering from a disease. One person undergoes a diagnostic test which has 98% reliability (i.e., 98% of people who are sick test positive and 98% of the healthy people test negative). If the person is tested positive, the chances that the person is actually having the disease is, approximately

Options :

802437965. 98%

802437966. 50%

802437967. 75%

802437968. 33%

Question Number : 17 Question Id : 802437242 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

एक देश की 1% जनसंख्या किसी बीमारी से पीड़ित है। एक व्यक्ति अपनी नैदानिक जाँच, जिसकी विश्वसनीयता 98% है (अर्थात 98% व्यक्ति जो कि बीमार हैं, के जाँच परिणाम सकारात्मक आते हैं और 98% व्यक्ति जो कि स्वस्थ हैं, के जाँच परिणाम नकारात्मक आते हैं), करवाता है। यदि उस व्यक्ति के जाँच परिणाम सकारात्मक आए हैं, तो उस व्यक्ति के वास्तव में बीमार होने की संभावना लगभग _____ है।

Options :

802437965. 98%

802437966. 50%

802437967. 75%

802437968. 33%

Question Number : 18 Question Id : 802437243 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

A man of height 2 m looks at the top of a 40 m tall building from some distance. The angle of elevation of his line of sight is 45°. When he further moves away from the building by a distance x, the angle of elevation becomes 30°. Then x is approximately

Options :

802437969. 20 m

802437970. 12 m

802437971. 34 m

802437972. 28 m

Question Number : 18 Question Id : 802437243 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

एक 2 मी. ऊँचाई का व्यक्ति, एक 40 मी. ऊँची इमारत के शिखर को किसी दूरी से देखता है। इसकी दृष्टि-रेखा के साथ बनने वाले ऊँचाई का कोण 45° है। यदि वह इमारत से x दूर और चला जाता है, तो ऊँचाई का कोण 30° हो जाता है, तो दूरी लगभग _____ है।

Options :

802437969. 20 m

802437970. 12 m

802437971. 34 m

802437972. 28 m

Question Number : 19 Question Id : 802437244 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

In an 800 m wide river, water flows at a speed of 9 km/h. A man can row a boat in still water with a speed of 15 km/h. If the path of the boat is maintained perpendicular to the flow of the water, then how long will the man take to cross it?

Options :

802437973. 12 min

802437974. 4 min

802437975. 6 min

802437976. 20 min

Question Number : 19 Question Id : 802437244 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

एक 800 मी. चौड़ी नदी में, 9 कि.मी./घंटा की गति से पानी बहता है। एक व्यक्ति स्थिर पानी में 15 कि.मी./घंटा की गति से नाव चला सकता है। यदि, नाव की दिशा को पानी के बहाव की दिशा के लंबवत रखा गया है तो नदी को पार करने में उस व्यक्ति को कितना समय लगेगा ?

Options :

802437973. 12 मिनट

802437974. 4 मिनट

802437975. 6 मिनट

802437976. 20 मिनट

Question Number : 20 Question Id : 802437245 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

On a large flat surface identical circular coins are placed in the most compact arrangement without overlapping with each other. If the number of coins available is unlimited, then the fraction of the surface area that is not covered by the coins is closest to

Options :

802437977. $1 - \pi/(2\sqrt{3})$

802437978. $\pi/(2\sqrt{3})$

802437979. $1- \pi/(3\sqrt{2})$

802437980. $\pi/4$

Question Number : 20 Question Id : 802437245 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

एक विशाल समतल सतह पर समरूप गोलाकार सिक्के अधिकतम सघन व्यवस्था से बिना परस्पर ढकते हुए रखे गए हैं। यदि, उपलब्ध सिक्कों की संख्या असीमित है, तो सतह के क्षेत्रफल का वह भाग जो कि सिक्कों से ढका हुआ नहीं है, ...के निकटतम है।

Options :

802437977. $1 - \pi/(2\sqrt{3})$

802437978. $\pi/(2\sqrt{3})$

802437979. $1- \pi/(3\sqrt{2})$

802437980. $\pi/4$

Part B Chemical Sciences

Section Id :	8024378
Section Number :	2
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	40
Number of Questions to be attempted :	35
Section Marks :	70
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	80243712
Question Shuffling Allowed :	Yes

Question Number : 21 Question Id : 802437246 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

For the given reaction

$[^{*}Co(L)_n]^{2+} + [Co(L)_n]^{3+} \rightarrow [^{*}Co(L)_n]^{3+} + [Co(L)_n]^{2+}$

the correct statement with respect to the rate of electron transfer process is

o-phen = *o*-phenanthroline; *Co is labeled atom

Options :

802437981. fast electron transfer; L = NH_3; n = 6

802437982. slow electron transfer; L = *o*-phen; n = 3

802437983. very slow electron transfer; L = NH_3; n = 6

802437984. very slow electron transfer; L = *o*-phen; n = 3

Question Number : 21 Question Id : 802437246 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

दी गयी अभिक्रिया के लिए

$[^*Co(L)_n]^{2+} + [Co(L)_n]^{3+} \rightarrow [^*Co(L)_n]^{3+} + [Co(L)_n]^{2+}$

इलेक्ट्रॉन स्थानांतरण प्रक्रम के संदर्भ में सही कथन है

o-phen = *o*-phenanthroline; *Co चिन्हित परमाणु

Options :

802437981. तीव्र इलेक्ट्रॉन स्थानांतरण; L = NH_3; n = 6

802437982. मन्द इलेक्ट्रॉन स्थानांतरण; L = *o*-phen; n = 3

802437983. अतिमन्द इलेक्ट्रॉन स्थानांतरण; L = NH_3; n = 6

802437984. अतिमन्द इलेक्ट्रॉन स्थानांतरण; L = *o*-phen; n = 3

Question Number : 22 Question Id : 802437247 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

Choose the correct order of energy of $2\sigma_g$ and $1\pi_u$ molecular orbitals for B_2, C_2 and O_2:

Options :

802437985. $2\sigma_g > 1\pi_u$ for all the three

802437986. $2\sigma_g > 1\pi_u$ for B_2 and C_2 only

802437987. $1\pi_u > 2\sigma_g$ for C_2 and O_2 only

802437988. $2\sigma_g > 1\pi_u$ for B_2 and O_2 only

Question Number : 22 Question Id : 802437247 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

B_2, C_2 तथा O_2 के $2\sigma_g$ तथा $1\pi_u$ आण्विक कक्षकों की ऊर्जा का सही क्रम चुनिए:

Options :

802437985. तीनों के लिए $2\sigma_g > 1\pi_u$

802437986. केवल B_2 तथा C_2 के लिए $2\sigma_g > 1\pi_u$

802437987. केवल C_2 तथा O_2 के लिए $1\pi_u > 2\sigma_g$

802437988. केवल B_2 तथा O_2 के लिए $2\sigma_g > 1\pi_u$

Question Number : 23 Question Id : 802437248 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The pair in which both actinides show +3 oxidation state only is

Options :

802437989. Ac and Lr

802437990. Ac and No

802437991. Cm and Bk

802437992. Cm and Lr

Question Number : 23 Question Id : 802437248 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

युग्म जिसमें दोनों ऐक्टिनाइड केवल +3 ऑक्सीकरण अवस्था दर्शाते हैं, वह है

Options :

802437989. Ac तथा Lr

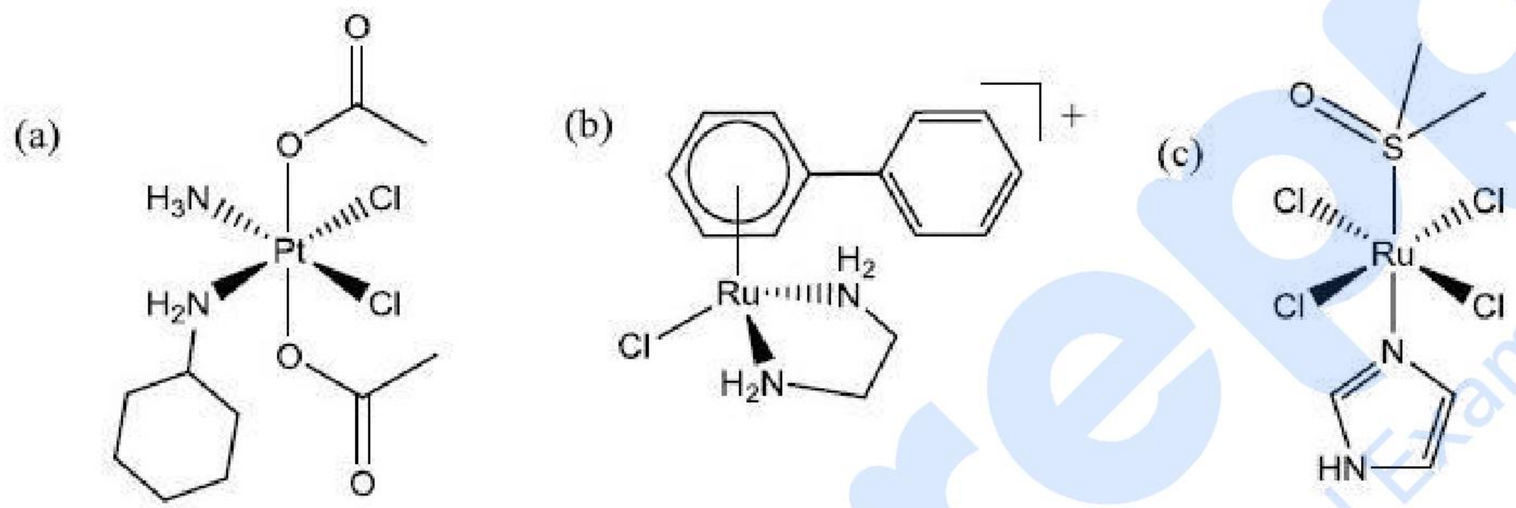
802437990. Ac तथा No

802437991. Cm तथा Bk

802437992. Cm तथा Lr

Question Number : 24 Question Id : 802437249 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The complex(es) showing activity against cancerous cells is/are



Options :

802437993. (a) only

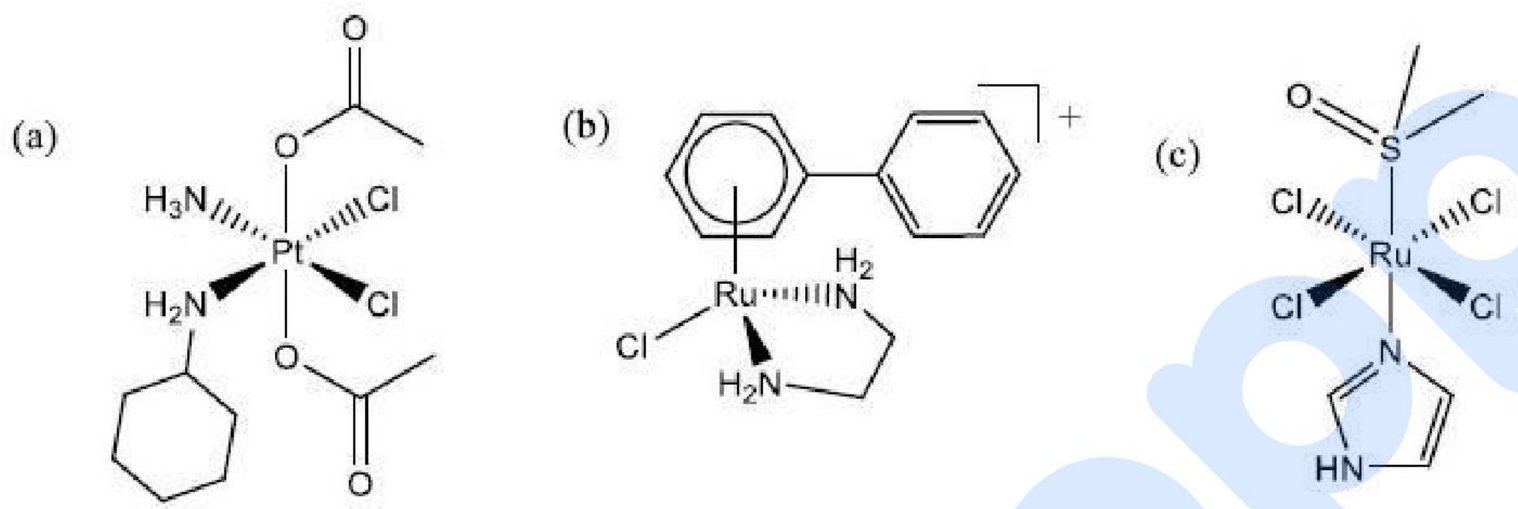
802437994. (a) and (b) only

802437995. (a) and (c) only

802437996. (a), (b) and (c)

Question Number : 24 Question Id : 802437249 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

कैन्सर की सेलों के प्रति सक्रियता दर्शाने वाला/वाले संकुल है/हैं



Options :

802437993. केवल (a)

802437994. केवल (a) तथा (b)

802437995. केवल (a) तथा(c)

802437996. (a), (b) तथा (c)

Question Number : 25 Question Id : 802437250 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

Consider the nuclear reaction

$_{92}X^{234} + \beta + \alpha \rightarrow Y + \gamma + 2\beta^{+}$

Y is

Options :

802437997. $_{92}Y^{238}$

802437998. $_{91}Y^{238}$

802437999. $_{93}Y^{236}$

8024371000. $_{94}Y^{238}$

Question Number : 25 Question Id : 802437250 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

न्यूकलीय अभिक्रिया पर विचार कीजिए

$_{92}X^{234} + \beta + \alpha \rightarrow Y + \gamma + 2\beta^{+}$

Y है

Options :

802437997. $_{92}Y^{238}$

802437998. $_{91}Y^{238}$

802437999. $_{93}Y^{236}$

8024371000. $_{94}Y^{238}$

Question Number : 26 Question Id : 802437251 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

Correct statement/s among the following with respect to ionization energy (IE) is/are

(i) ($IE_1 + IE_2 + IE_3$) for indium is more than that of aluminium

(ii) IE_1 of scandium is higher than that of cobalt

(iii) IE_1 of gallium is lower than that of selenium

(iv) IE_1 of nitrogen is greater than that of oxygen

Options :

8024371001. (ii) and (iv)

8024371002. (iii) and (iv)

8024371003. (i) and (iv)

(ii) and (iii)
8024371004.

Question Number : 26 Question Id : 802437251 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

आयनन ऊर्जा (IE) के संदर्भ में निम्नलिखित में से सही कथन है/हैं

(i) ऐलुमिनियम की अपेक्षा इंडियम की ($IE_1 + IE_2 + IE_3$) अधिक है।

(ii) कोबाल्ट की अपेक्षा स्कैन्डियम की IE_1 अधिक है।

(iii) सिलीनीयम की अपेक्षा गैलियम की IE_1 कम है।

(iv) ऑक्सीज़न की अपेक्षा नाइट्रोजन की IE_1 अधिक है।

Options :

(ii) तथा (iv)
8024371001.

(iii) तथा (iv)
8024371002.

(i) तथा (iv)
8024371003.

(ii) तथा (iii)
8024371004.

Question Number : 27 Question Id : 802437252 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The reason for significantly high solubility of $AgClO_4$ in benzene than in alkane solvents is

Options :

8024371005. Alkane solvents are non- polar.

8024371006. Benzene is an aprotic solvent.

8024371007. PhAg is formed.

8024371008. Benzene acts as a soft base

Question Number : 27 Question Id : 802437252 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

$AgClO_4$, की ऐल्केन विलायकों की तुलना में, बेन्ज़ीन में विलेयता के सार्थक रूप से उच्च होने का कारण

Options :

8024371005. ऐल्केन विलायकों का अध्रुवीय होना है।

8024371006. बेन्ज़ीन का एक अप्रोटिक विलायक होना है।

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8024371007. PhAg का विरचन होना है।

8024371008. बेन्ज़ीन का एक साफ्ट बेस की तरह से व्यवहार करना है।

Question Number : 28 Question Id : 802437253 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

Correct statement for 'Inductively Coupled Plasma Atomic Emission Spectroscopy' is

Options :

8024371009. It is unsuitable for all non-metals.

8024371010. Simultaneous determination of only metals is possible.

8024371011. Induction coil stabilizes plasma.

8024371012. Oxide formation lowers atomization of metals.

Question Number : 28 Question Id : 802437253 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

प्रेरण युग्मित प्लैज्मा परमाण्वीय उत्सर्जन स्पेक्ट्रमिकी के लिए सही कथन है

Options :

8024371009. सभी अ-धातुओं के लिए यह अन-उपयुक्त है।

8024371010. केवल धातुओं का ही एक साथ निर्धारण संभव है।

8024371011. प्रेरण कुंडल प्लैज्मा को स्थिर करता है।

8024371012. ऑक्साइड का विरचन धातुओं के, परमाणुओं में कणन को कम करता है।

Question Number : 29 Question Id : 802437254 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The number of geometrical isomers of the complex $[RhH(C{\equiv}CR)_2(PMe_3)_3]$ is

Options :

8024371013. 2

8024371014. 3

8024371015. 4

8024371016. 1

Question Number : 29 Question Id : 802437254 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

संकुल $[RhH(C{\equiv}CR)_2(PMe_3)_3]$ के ज्यामितीय समावयवों की संख्या है

Options :

8024371013. 2

8024371014. 3

8024371015. 4

8024371016. 1

Question Number : 30 Question Id : 802437255 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

I_2 is violet in the solid as well as in gas phase. However in acetone or ethanol, it turns brown. Choose the correct statement(s) for this colour change:

(a) Dissociation of I_2 in atomic state

(b) Interaction of low-lying σ^*-orbital of iodine with lone pair of O (solvent)

(c) Formation of a charge-transfer complex

Options :

8024371017. (a) only

8024371018. (b) only

8024371019. (a) and (b) only

8024371020. (b) and (c) only

Question Number : 30 Question Id : 802437255 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

ठोस तथा गैसीय अवस्था में I_2 बैंगनी रंग की होती है। ऐसीटोन अथवा एथनॉल में यह भूरे रंग की हो जाती है। रंग परिवर्तन के लिए सही कथन/कथनों को चुनिए

(a) I_2 का परमाण्वीय अवस्था में विघटन

(b) आयोडीन के निम्नस्थ σ^*- कक्षकों की O (विलायक) के एकाकी युग्म से अन्योन्यक्रिया

(c) आवेश-स्थानांतरण संकुल का विरचन

Options :

केवल (a)

8024371017.

केवल (b)

8024371018.

केवल (a) तथा (b)

8024371019.

केवल (b) तथा (c)

8024371020.

Question Number : 31 Question Id : 802437256 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The pair of compounds in which both members show LMCT band in their electronic spectra is

Options :

8024371021. $[FeCl_4]^{2-}$ and $[Fe(bpy)_3]^{2+}$

8024371022. $[FeBr_4]^{2-}$ and $[TcO_4]^{-}$

8024371023. $[ReO_4]^{-}$ and $[Ru(bpy)_3]^{2+}$

8024371024. $[Fe(phen)_3]^{2+}$ and $[FeCl_4]^{2-}$

Question Number : 31 Question Id : 802437256 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

यौगिकों का युग्म जिसके दोनों सदस्य इलेक्ट्रॉनिक स्पेक्ट्रम में LMCT बैन्ड दर्शाते हैं, वह है

Options :

8024371021. $[FeCl_4]^{2-}$ तथा $[Fe(bpy)_3]^{2+}$

8024371022. $[FeBr_4]^{2-}$ तथा $[TcO_4]^{-}$

8024371023. $[ReO_4]^{-}$ तथा $[Ru(bpy)_3]^{2+}$

8024371024. $[Fe(phen)_3]^{2+}$ तथा $[FeCl_4]^{2-}$

Question Number : 32 Question Id : 802437257 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

During the binding of O_2 to myoglobin (consider 'heme' in *xy*-plane), the molecular orbital of O_2 and atomic orbital of Fe involved in the formation of the σ-bond is

Options :

8024371025. π^* and d_{z^2}

8024371026. π^* and d_{xz}

8024371027. π and d_{xz}

8024371028. π and d_{z^2}

Question Number : 32 Question Id : 802437257 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

O_2 के आण्वीय कक्षक तथा Fe के परमाण्वीय कक्षक जो, मायोग्लोबिन (हीम को *xy*-तल में लीजिए) तथा O_2 के मध्य आबन्धन में सम्मलित होकर σ आबन्ध बनाते हैं, वह हैं

Options :

8024371025. π* तथा d_{z^2}

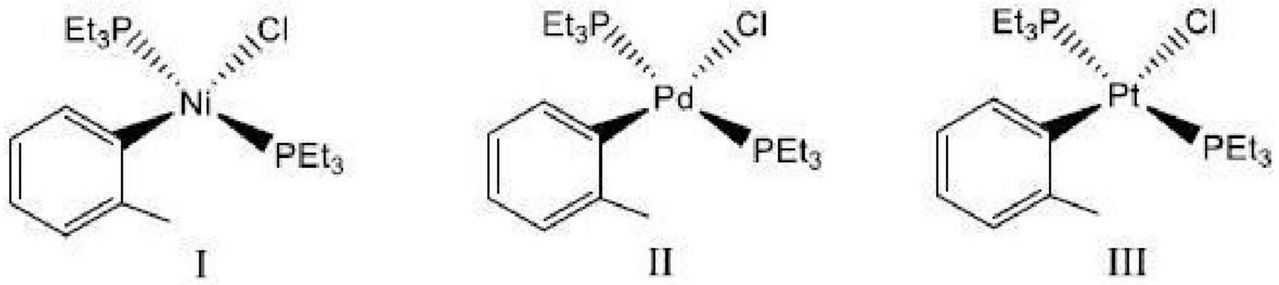
8024371026. π* तथा d_{xz}

8024371027. π तथा d_{xz}

8024371028. π तथा d_{z^2}

Question Number : 33 Question Id : 802437258 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The order of rate of substitution of chloride by pyridine (in ethanol) in the following complexes



is

Options :

8024371029. I > II > III

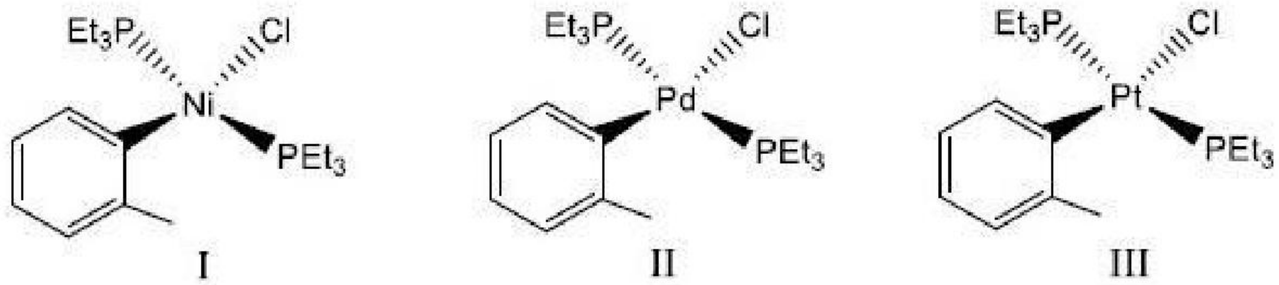
8024371030. I ≈ II ≈ III

8024371031. I > II ≈ III

8024371032. I < II ≈ III

Question Number : 33 Question Id : 802437258 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

निम्नलिखित संकुलों में क्लोराइड का पिरीडीन से प्रतिस्थापन (एथनॉल में) दर का क्रम है



Options :

8024371029. I > II > III

8024371030. I ≈ II ≈ III

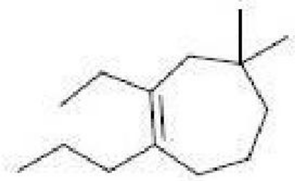
8024371031. I > II ≈ III

8024371032. I < II ≈ III

Sub-Section Number :	2
Sub-Section Id :	80243713
Question Shuffling Allowed :	Yes

Question Number : 34 Question Id : 802437259 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The correct IUPAC name for the following molecule is



Options :

8024371033. 1-Propyl-2-ethyl-4,4-dimethylcyclohept-1-ene

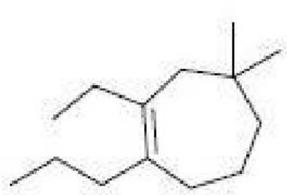
8024371034. 2-Ethyl-4,4-dimethyl-1-propylcyclohept-1-ene

8024371035. 3-Ethyl-1,1-dimethyl-4-propylcyclohept-3-ene

8024371036. 1,1-Dimethyl-3-ethyl-4-propylcyclohept-3-ene

Question Number : 34 Question Id : 802437259 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

निम्नलिखित यौगिक का सही IUPAC नाम है



Options :

8024371033. 1-प्रोपिल-2-एथिल-4, 4-डाई मेथिलसाइक्लोहेप्ट-1-ईन

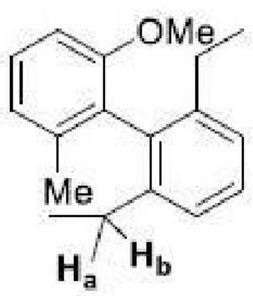
8024371034. 2-एथिल-4, 4-डाईमेथिल-1-प्रोपिलसाइक्लोहेप्ट-1-ईन

8024371035. 3-एथिल-1,1-डाईमेथिल-4-प्रोपिलसाइक्लोहेप्ट-3-ईन

8024371036. 1, 1-डाईमेथिल-3-एथिल-4-प्रोपिलसाइक्लोहेप्ट-3-ईन

Question Number : 35 Question Id : 802437260 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The stereochemical relationship of H_a and H_b in the following molecule is



Options :

8024371037. enantiotopic

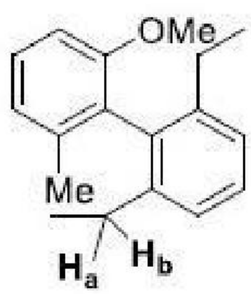
8024371038. homotopic

8024371039. diastereotopic

8024371040. constitutionally heterotopic

Question Number : 35 Question Id : 802437260 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

निम्नलिखित अणु में H_a तथा H_b का त्रिविम रासायनिक संबंध है



Options :

8024371037. ऐनैन्टिओटॉपिक

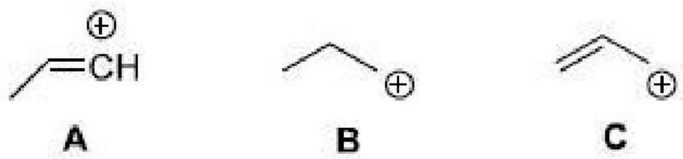
8024371038. होमोटॉपिक

8024371039. डिस्टेरोटॉपिक

8024371040. संघटनात्मक हीट्रोटॉपिक

Question Number : 36 Question Id : 802437261 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The correct order of stability of the carbocations **A-C** is



Options :

8024371041. C > A > B

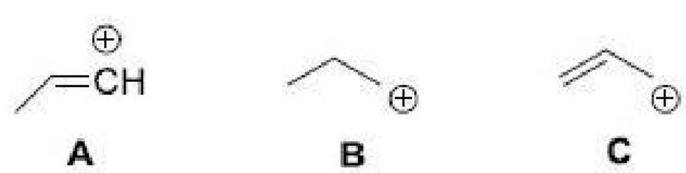
8024371042. A > C > B

8024371043. B > C > A

8024371044. C > B > A

Question Number : 36 Question Id : 802437261 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

कार्बोधनायनों **A-C** की स्थिरता का सही क्रम है



Options :

8024371041. C > A > B

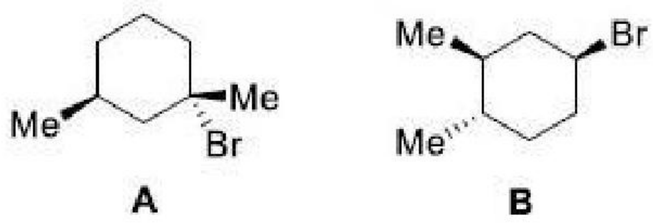
8024371042. A > C > B

8024371043. B > C > A

8024371044. C > B > A

Question Number : 37 Question Id : 802437262 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The correct statement for the orientation of the bromine atoms in the most stable conformations of **A** and **B** is



Options :

8024371045. axial in both **A** and **B**

8024371046. axial in **A** and equatorial in **B**

8024371047. equatorial in both **A** and **B**

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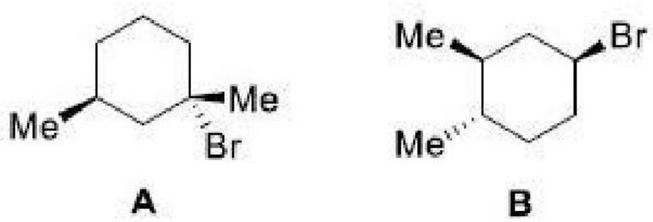
8024371048. equatorial in **A** and axial in **B**

Question Number : 37 Question Id : 802437262 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

A तथा B के सर्वाधिक स्थिर संरूपण में ब्रोमीन परमाणुओं के अभिविन्यास के लिए सही कथन है



A B

Options :

8024371045. A तथा B दोनों में अक्षीय

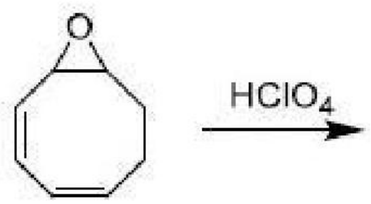
8024371046. A में अक्षीय तथा B में मध्यवर्ती

8024371047. A तथा B दोनों में मध्यवर्ती

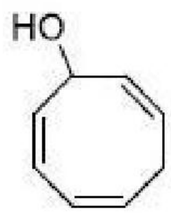
8024371048. A में मध्यवर्ती तथा B में अक्षीय

Question Number : 38 Question Id : 802437263 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

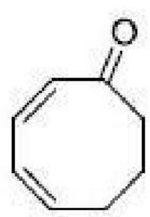
The major product formed in the following reaction is



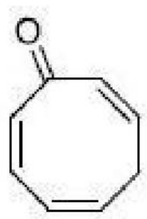
Options :



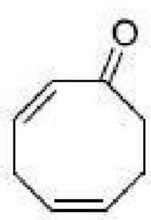
8024371049.



8024371050.



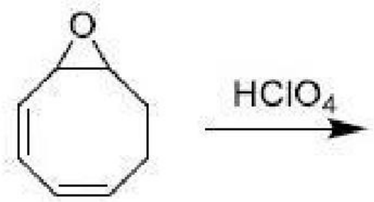
8024371051.



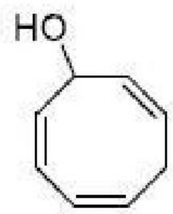
8024371052.

Question Number : 38 Question Id : 802437263 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

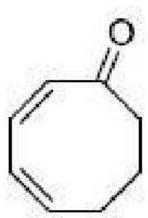
निम्नलिखित अभिक्रिया में विरचित मुख्य उत्पाद है



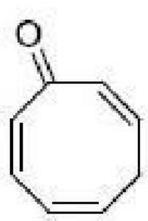
Options :



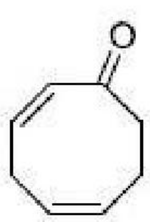
8024371049.



8024371050.



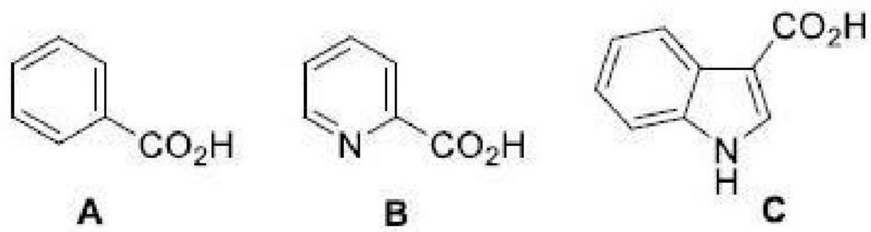
8024371051.



8024371052.

Question Number : 39 Question Id : 802437264 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The following carboxylic acids undergo decarboxylation upon heating. The ease of decarboxylation is in the order



Options :

8024371053. B > A > C

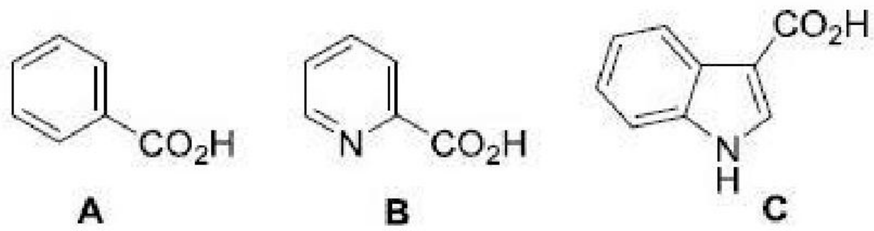
8024371054. C > B > A

8024371055. A > C > B

8024371056. C > A > B

Question Number : 39 Question Id : 802437264 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

निम्नलिखित कार्बोक्सिलिक अम्लों का विकार्बोक्सिलकरण गर्म करने पर होता है।
विकार्बोक्सिलकरण की सुगमता का क्रम है



Options :

8024371053. B > A > C

8024371054. C > B > A

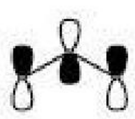
8024371055. A > C > B

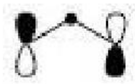
8024371056. C > A > B

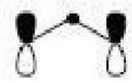
Question Number : 40 Question Id : 802437265 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The HOMO of π-molecular orbitals of methylazide is

Options :

8024371057. 

8024371058. 

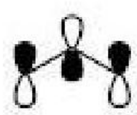
8024371059. 

8024371060.

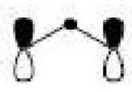
Question Number : 40 Question Id : 802437265 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

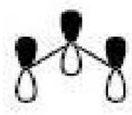
मेथिल ऐज़ाइड के π-आण्विक कक्षकों में HOMO है

Options :

8024371057. 

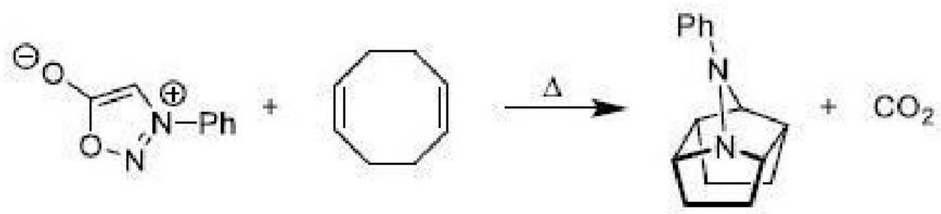
8024371058.

8024371059. 

8024371060. 

Question Number : 41 Question Id : 802437266 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The following transformation involves a series of



Options :

8024371061. electrocyclic ring-opening and closing reactions.

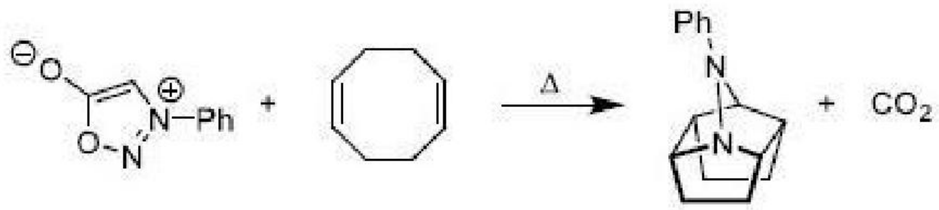
8024371062. cycloaddition and cycloreversion reactions.

8024371063. sigmatropic rearrangements.

8024371064. cheletropic addition and elimination reactions.

Question Number : 41 Question Id : 802437266 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

निम्नलिखित रूपांतरण में सम्मलित अभिक्रियाओं की श्रृंखला है,



Options :

8024371061. इलेक्ट्रोसाइक्लिक वलय विभंग तथा संवरण अभिक्रियायें ।

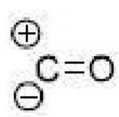
8024371062. साइक्लोसंकलन तथा साइक्लोप्रत्यावर्तन अभिक्रियायें ।

8024371063. सिग्माट्रॉपिक पुनर्विन्यास अभिक्रियायें ।

8024371064. कीलेट्रॉपिक संकलन तथा विलोपन अभिक्रियायें ।

Question Number : 42 Question Id : 802437267 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The synthetic equivalent of the given synthon is



Options :

8024371065. *t*-butyl isocyanide

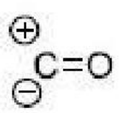
8024371066. *t*-butyl cyanide

8024371067. *t*-butyl cyanate

8024371068. *t*-butyl isocyanate

Question Number : 42 Question Id : 802437267 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

दिये गये सिन्थॉन का संक्षिप्ट समतुल्य है



Options :

8024371065. *t*-ब्यूटिल आइसोसायनाइड

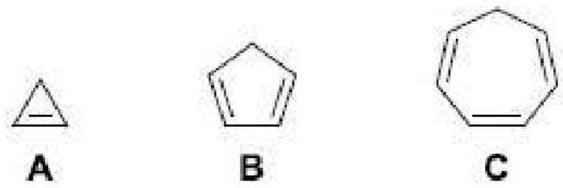
8024371066. *t*-ब्यूटिल सायनाइड

8024371067. *t*-ब्यूटिल सायनेट

8024371068. *t*-ब्यूटिल आइसोसायनेट

Question Number : 43 Question Id : 802437268 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The correct order of the pK_a of the following compounds is



Options :

8024371069. C > B > A

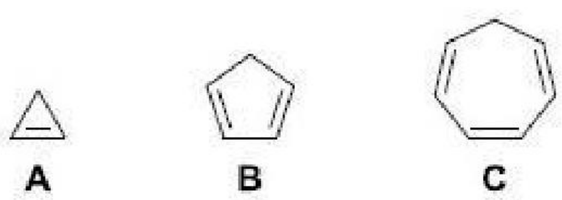
8024371070. A > C > B

8024371071. B > A > C

8024371072. A > B > C

Question Number : 43 Question Id : 802437268 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

निम्नलिखित यौगिकों के pK_a का सही क्रम है



Options :

8024371069. C > B > A

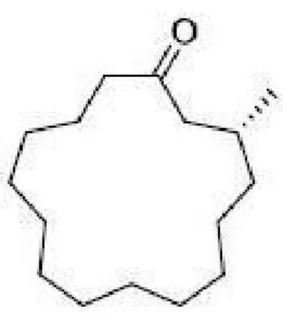
8024371070. A > C > B

8024371071. B > A > C

8024371072. A > B > C

Question Number : 44 Question Id : 802437269 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

Muscone is a



Muscone

Options :

8024371073. terpenoid

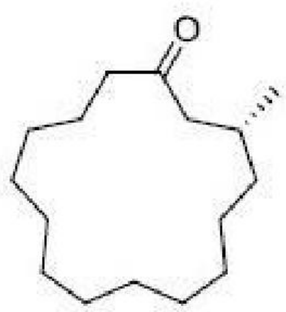
8024371074. steroid

8024371075. polyketide

8024371076. flavonoid

Question Number : 44 Question Id : 802437269 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

मस्कोन है



Muscone

Options :

8024371073. टर्पीनाइड

8024371074. स्टेरॉइड

8024371075. पॉलिकीटाइड

8024371076. फ्लैवोनाइड

Question Number : 45 Question Id : 802437270 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The natural product that gives a signal at δ 218 ppm in its ^{13}C NMR spectrum is

Options :

8024371077. α-pinene

8024371078. camphor

8024371079. geraniol

8024371080. carvone

Question Number : 45 Question Id : 802437270 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

अपने ^{13}C NMR स्पेक्ट्रम में δ218 ppm पर जो प्राकृतिक उत्पाद सिग्नल देता है, वह है

Options :

8024371077. α-पाइनीन

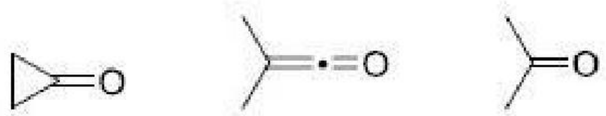
8024371078. कैम्फर

8024371079. जिरेनिऑल

8024371080. कार्वोन

Question Number : 46 Question Id : 802437271 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The correct order of carbonyl stretching frequency for the given compounds is



A B C

Options :

8024371081. A > B > C

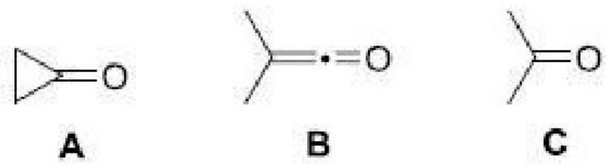
8024371082. B > C > A

8024371083. C > A > B

8024371084. B > A > C

Question Number : 46 Question Id : 802437271 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

दिये गये यौगिकों में कार्बोनिल की प्रत्रान आवृत्ति का सही क्रम है



Options :

8024371081. A > B > C

8024371082. B > C > A

8024371083. C > A > B

8024371084. B > A > C

Sub-Section Number :	3
Sub-Section Id :	80243714
Question Shuffling Allowed :	Yes

Question Number : 47 Question Id : 802437272 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The expectation value of p^2 of a particle in a cubic box of side ℓ, having the wave function $\psi_{n_x,n_y,n_z}(x,y,z) =$

$\left(\frac{2}{\ell}\right)^{3/2} \sin\frac{2\pi x}{\ell} \sin\frac{3\pi y}{\ell} \sin\frac{2\pi z}{\ell}$, is

Options :

8024371085. $\frac{17h^2}{4\ell^2}$

8024371086. $\frac{7h^2}{4\ell^2}$

8024371087. $\frac{3h^2}{\ell^2}$

8024371088. $\frac{13h^2}{4\ell^2}$

Question Number : 47 Question Id : 802437272 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

एक साइड ℓ, के घनीय बॉक्स में एक कण जिसका तरंग फलन

$\psi_{n_x,n_y,n_z}(x,y,z) = \left(\frac{2}{\ell}\right)^{3/2} \sin\frac{2\pi x}{\ell} \sin\frac{3\pi y}{\ell} \sin\frac{2\pi z}{\ell}$ है,

के p^2 का प्रत्याशा मान है

Options :

8024371085. $\frac{17h^2}{4\ell^2}$

8024371086. $\frac{7h^2}{4\ell^2}$

8024371087. $\frac{3h^2}{\ell^2}$

8024371088. $\frac{13h^2}{4\ell^2}$

Question Number : 48 Question Id : 802437273 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

For the d^3 electron configuration, the ground state term symbol is

Options :

8024371089. $^4F_{1/2}$

8024371090. $^4F_{3/2}$

8024371091. $^4F_{7/2}$

8024371092. $^4F_{9/2}$

Question Number : 48 Question Id : 802437273 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

d^3 इलेक्ट्रॉन विन्यास के लिए, निम्नतम अवस्था का पद प्रतीक है

Options :

8024371089. $^4F_{1/2}$

8024371090. $^4F_{3/2}$

8024371091. $^4F_{7/2}$

8024371092. $^4F_{9/2}$

Question Number : 49 Question Id : 802437274 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The total bond order between adjacent carbon atoms of benzene is

Options :

8024371093. 0.5

8024371094. 2

8024371095. 1.5

8024371096. 2.5

Question Number : 49 Question Id : 802437274 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

बेन्ज़ीन के सटे हुए कार्बन परमाणुओं के मध्य संपूर्ण आबन्ध क्रम है

Options :

8024371093. 0.5

8024371094. 2

8024371095. 1.5

8024371096. 2.5

Question Number : 50 Question Id : 802437275 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The following is the character table for the C_{2v} point group

C_{2v}	E	C_2	σ_v	σ_v'
A_1	1	1	1	1
A_2	1	1	−1	−1
B_1	1	−1	1	−1
B_2	1	−1	−1	1

There are two functions f_1 and f_2 belonging to A_2 and B_1 representations, respectively. The correct option for the product of two functions f_1 and f_2 and the integral $\int f_1 f_2 d\tau$ is

Options :

8024371097. The product belongs to A_2 representation and the integral is nonzero.

8024371098. The product belongs to B_2 representation and the integral is zero.

8024371099. The product belongs to A_1 representation and the integral is zero.

8024371100. The product belongs to B_1 representation and the integral is nonzero

Question Number : 50 Question Id : 802437275 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

C_{2v} बिंदु ग्रुप की अभिलक्षण सारणी निम्नलिखित है

C_{2v}	E	C_2	σ_v	σ_v'
A_1	1	1	1	1
A_2	1	1	−1	−1
B_1	1	−1	1	−1
B_2	1	−1	−1	1

दो फलन f_1 तथा f_2 क्रमश: A_2 तथा B_1 निरूपणों से संबंधित हैं। दोनों फलनों f_1 तथा f_2 के उत्पाद तथा समाकलित $\int f_1 f_2 d\tau$ के लिए उचित विकल्प है

Options :

8024371097. उत्पाद का A_2 निरूपण से संबंध है तथा समाकलित अशून्य है ।

8024371098. उत्पाद का B_2 निरूपण से संबंध है तथा समाकलित शून्य है ।

8024371099. उत्पाद का A_1 निरूपण से संबंध है तथा समाकलित शून्य है ।

8024371100. उत्पाद का B_1 निरूपण से संबंध है तथा समाकलित अशून्य है ।

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Question Number : 51 Question Id : 802437276 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The equilibrium dissociation energy of a diatomic molecule is 4.75 eV and its stretching frequency corresponds to 0.5 eV. The minimum energy required to dissociate the molecule in eV is

Options :

8024371101. 4.75

8024371102. 4.25

8024371103. 4.50

8024371104. 5.00

Question Number : 51 Question Id : 802437276 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

एक द्विपरमाणुक अणु की साम्य वियोजन ऊर्जा 4.75 eV है और इसकी प्रत्रान आवृत्ति 0.5 eV के अनुरूप है। अणु के वियोजन के लिए न्यूनतम आवश्यक ऊर्जा eV में है

Options :

8024371101. 4.75

8024371102. 4.25

8024371103. 4.50

8024371104. 5.00

Question Number : 52 Question Id : 802437277 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

A monatomic perfect gas undergoes expansion from (p_1, V_1) to (p_2, V_2) under isothermal or adiabatic conditions. The pressure of the gas will fall more rapidly under adiabatic conditions because

Options :

8024371105. $p \propto \frac{1}{V}$

8024371106. $p \propto \frac{1}{V^{7/5}}$

8024371107. $p \propto \frac{1}{V^{3/2}}$

8024371108. $p \propto \frac{1}{V^{5/3}}$

Question Number : 52 Question Id : 802437277 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 2 Wrong Marks : 0.5

एकपरमाणुक आदर्श गैस (p_1, V_1) से (p_2, V_2) तक समतापीय या रुद्धोष्म अवस्था में प्रसरण करती है। रुद्धोष्म अवस्था में गैस के दाब में अधिक तीव्र गति से गिरावट आती है क्योंकि

Options :

8024371105. $p \propto \frac{1}{V}$

8024371106. $p \propto \frac{1}{V^{7/5}}$

8024371107. $p \propto \frac{1}{V^{3/2}}$

8024371108. $p \propto \frac{1}{V^{5/3}}$

Question Number : 53 Question Id : 802437278 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

For the reaction $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$, the thermodynamic quantity which depends upon the pressure at which equilibrium is arrived at is (superscript 'o'represents standard state)

Options :

8024371109. ΔG^o

8024371110. ΔH^o

8024371111. K_P

8024371112. ratio of mole fractions, $\frac{x_{NH_3}^2}{x_{N_2}x_{H_2}^3}$, at equilibrium

Question Number : 53 Question Id : 802437278 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

अभिक्रिया $N_2(g) + 3H_2(g) \rightarrow 2NH_3(g)$ के लिए ऊष्मागतिक राशि जो उस दाब पर निर्भर करती है जिस पर साम्य प्राप्त होता है, वह है (सुपरस्क्रिप्ट 'o' मानक अवस्था को दर्शाती है)

Options :

8024371109. ΔG^o

8024371110. ΔH^o

8024371111. K_P

साम्य पर मोल अंशों का अनुपात $\frac{x_{NH_3}^2}{x_{N_2}x_{H_2}^3}$

8024371112.

Question Number : 54 Question Id : 802437279 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The $E^o(\mathrm{M}^+/\mathrm{M})$ of the cell, SHE||MX|M can be obtained from the plot of (E_{cell} is the cell potential and m is the molality of ideal dilute solution of MX)

Options :

8024371113. E_{cell} against $(T \log m)$

8024371114. E_{cell} against $\left(\frac{1}{T}\log m\right)$

8024371115. E_{cell} against $(\mathrm{T}\sqrt{m})$

8024371116. E_{cell} against $\left(\frac{\sqrt{m}}{T}\right)$

Question Number : 54 Question Id : 802437279 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

सेल SHE||MX|M के $E^o(M^+/M)$ को प्राप्त कर सकते हैं आलेख (E_{cell}, सेल का विभव है तथा m, MX के तुन आदर्श विलयन की मोललता है)

Options :

8024371113. E_{cell} के विरुद्ध $(T \log m)$ से

8024371114. E_{cell} के विरुद्ध $\left(\frac{1}{T} \log m\right)$ से

8024371115. E_{cell} के विरुद्ध $(T\sqrt{m})$ से

8024371116. E_{cell} के विरुद्ध $\left(\frac{\sqrt{m}}{T}\right)$ से

Question Number : 55 Question Id : 802437280 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The *y*-intercept obtained from the plot of viscosity of a series of polymer solutions against the concentration is 0.05. The proportionality constant K and exponent a for this polymer – solvent pair are 5×10^{-5} and 0.5, respectively. The molar mass of the polymer in g mol^{-1} is

Options :

8024371117. 10^9

8024371118. 10^5

8024371119. 10^6

8024371120. 10^7

Question Number : 55 Question Id : 802437280 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

बहुलक विलयनों की एक श्रृंखला के लिए श्यानता तथा सान्द्रता के मध्य आलेख का *y*-अंत: खंड 0.05 है। इस बहुलक-विलायक युग्म के लिए आनुपातिक स्थिरांक K तथा घातांक *a* क्रमश: 5×10^{-5} तथा 0.5 हैं। बहुलक की g mol^{-1} में मोलर संहति है

Options :

8024371117. 10^9

8024371118. 10^5

8024371119. 10^6

8024371120. 10^7

Question Number : 56 Question Id : 802437281 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

In the ccp packing, the number of lattice points per unit area in the planes is in the order

Options :

8024371121. $(100) > (110) > (111)$

8024371122. $(100) > (111) > (110)$

8024371123. $(111) > (100) > (110)$

8024371124. $(111) > (110) > (100)$

Question Number : 56 Question Id : 802437281 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

जालक बिन्दुओं की संख्या प्रति एकक क्षेत्र, ccp संकुलन के तलों में, जिस क्रम में है, वह है

Options :

8024371121. $(100) > (110) > (111)$

8024371122. $(100) > (111) > (110)$

8024371123. $(111) > (100) > (110)$

8024371124. $(111) > (110) > (100)$

Question Number : 57 Question Id : 802437282 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The correct statement about chemisorption is

Options :

8024371125. Chemisorption results in multi molecular layer adsorption.

8024371126. Chemisorption is reversible in nature.

8024371127. Chemisorption has lower specificity than physisorption.

8024371128. Chemisorption occurs due to formation of chemical bonds.

Question Number : 57 Question Id : 802437282 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

रासायनिक अधिशोषण के लिए सही कथन है

Options :

8024371125. रासायनिक अधिशोषण से अधिशोषण की बहु आण्विक परतें उत्पन्न होती हैं।

8024371126. रासायनिक अधिशोषण उत्क्रमणीय प्रकृति का होता है।

8024371127. भौतिक अधिशोषण की अपेक्षा रासायनिक अधिशोषण की विशिष्टता कम होती है।

8024371128. रासायनिक आबन्धों के विरचन से रासायनिक अधिशोषण उत्पन्न होता है।

Question Number : 58 Question Id : 802437283 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

For a reaction, raising the temperature from 200 K to 300 K results in the increase of rate constant by a factor of 2. The activation energy for this reaction in kJ mol^{-1} is closest to

$(\ln 2 = 0.69)$

Options :

8024371129. 7.0

8024371130. 3.5

8024371131. 14.0

8024371132. 0.83

Question Number : 58 Question Id : 802437283 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

एक अभिक्रिया का ताप 200 K से 300 K तक बढ़ाने पर उसका दर नियतांक 2 के गुणक से बढ़ जाता है। kJ mol^{-1} में इस अभिक्रिया की सक्रियण ऊर्जा जिसके निकटतम है, वह है

$(\ln 2 = 0.69)$

Options :

8024371129. 7.0

8024371130. 3.5

8024371131. 14.0

8024371132. 0.83

Question Number : 59 Question Id : 802437284 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The $y-$ intercept of the least square fitted straight line to the data in the table is closest to

x	-2.01	-0.98	1.01	1.99
y	-4.01	-1.98	2.01	3.99

Options :

8024371133. -0.2

8024371134. -0.1

8024371135. 0

8024371136. 0.2

Question Number : 59 Question Id : 802437284 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

तालिका में दिए गए आंकड़ों को न्यूनतम वर्ग विधि से फिट करने पर प्राप्त सीधी रेखा का y – अंत: खंड जिसके निकटतम है, वह है

x	– 2.01	– 0.98	1.01	1.99
y	– 4.01	– 1.98	2.01	3.99

Options :

8024371133. – 0.2

8024371134. – 0.1

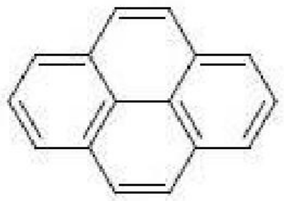
8024371135. 0

8024371136. 0.2

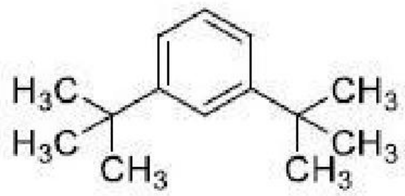
Question Number : 60 Question Id : 802437285 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

The guest molecule which will fit best inside α-cyclodextrin by interacting with both, rim and cavity, is

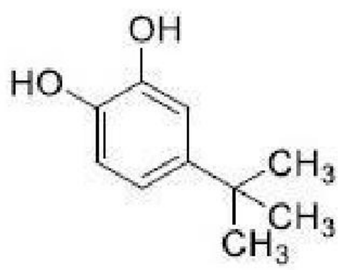
Options :



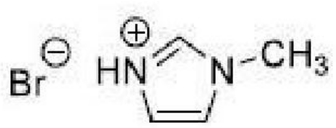
8024371137.



8024371138.



8024371139.

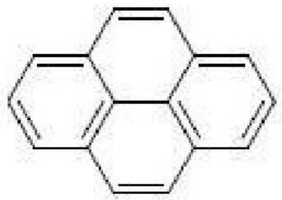


8024371140.

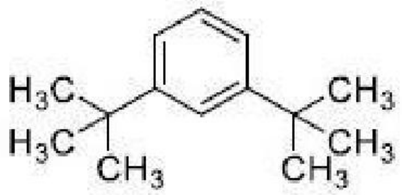
Question Number : 60 Question Id : 802437285 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 2 Wrong Marks : 0.5

α-साइक्लोडेक्सट्रीन के अन्दर रिम तथा कोटर दोनों से अन्योन्यक्रिया करके उसमें जो अतिथि अणु सर्वोत्तम रूप से फिट होगा, वह है

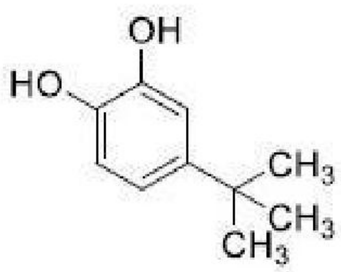
Options :



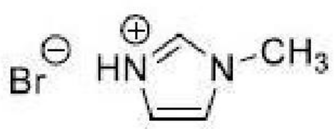
8024371137.



8024371138.



8024371139.



8024371140.

Part C Chemical Sciences

Section Id :	8024379
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	60
Number of Questions to be attempted :	25

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Section Marks :	100
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	80243715
Question Shuffling Allowed :	Yes

Question Number : 61 Question Id : 802437286 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Among the following complexes, the one showing the highest rate of substitution of a CO ligand on heating with one equivalent of PPh_3 in decalin, is

Options :

8024371141. $(\eta^5\text{-}C_5H_5)Mn(CO)_3$

8024371142. $(\eta^5\text{-}C_5Ph_5)Mn(CO)_3$

8024371143. $(\eta^5\text{-}C_5Me_5)Mn(CO)_3$

8024371144. $(\eta^5\text{-indenyl})Mn(CO)_3$

Question Number : 61 Question Id : 802437286 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

निम्नलिखित संकुलों में से जिसकी एक तुल्य PPh_3 के साथ डेकालिन में गर्म करने पर CO प्रतिस्थापन की दर सर्वाधिक होती है, वह है

Options :

8024371141. $(\eta^5\text{-}C_5H_5)Mn(CO)_3$

8024371142. $(\eta^5\text{-}C_5Ph_5)Mn(CO)_3$

8024371143. $(\eta^5\text{-}C_5Me_5)Mn(CO)_3$

8024371144. $(\eta^5\text{-indenyl})Mn(CO)_3$

Question Number : 62 Question Id : 802437287 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The correct electronic configuration of frontier MO's of $Mn(\eta^5\text{-}C_5Me_5)_2$ is

Options :

8024371145. $e^2_{2g}\, a^1_{1g}\, e^2_{1g}$

8024371146. $e^4_{2g}\, a^1_{1g}$

8024371147. $e^3{}_{2g}\,a^2{}_{1g}$

8024371148. $a^2{}_{1g}\,e^3{}_{2g}$

Question Number : 62 Question Id : 802437287 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

$Mn(\eta^5\text{-}C_5Me_5)_2$ के सीमान्त MO's का सही इलेक्ट्रॉन विन्यास है

Options :

8024371145. $e^2{}_{2g}\,a^1{}_{1g}\,e^2{}_{1g}$

8024371146. $e^4{}_{2g}\,a^1{}_{1g}$

8024371147. $e^3{}_{2g}\,a^2{}_{1g}$

8024371148. $a^2{}_{1g}\,e^3{}_{2g}$

Question Number : 63 Question Id : 802437288 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

On heating $[Mo(N_2)_2(PMe_2Ph)_4]$ and $[ReCl(N_2)(PMe_2Ph)_4]$, the products formed are respectively

Options :

8024371149. $[(\eta^6\text{-}PhPMe_2)Mo(PMe_2Ph)_3]$ and $[(\eta^6\text{-}PhPMe_2)Re(PMe_2Ph)_3]Cl$

8024371150. $[(PMe_2Ph)_4Mo(\mu\text{-}N_2)_2Mo(PMe_2Ph)_4]$ and $[(PMe_2Ph)_4Re(\mu\text{-}Cl)_2Re(PMe_2Ph)_4]$

8024371151. $[(\eta^6\text{-}PhPMe_2)Mo(PMe_2Ph)_3]$ and $[(PMe_2Ph)_4Re(\mu\text{-}Cl)_2Re(PMe_2Ph)_4]$

8024371152. $[(PMe_2Ph)_4Mo(\mu\text{-}N_2)_2Mo(PMe_2Ph)_4]$ and $[(\eta^6\text{-}PhPMe_2)Re(PMe_2Ph)_3]Cl$

Question Number : 63 Question Id : 802437288 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

$[Mo(N_2)_2(PMe_2Ph)_4]$ तथा $[ReCl(N_2)(PMe_2Ph)_4]$ को गर्म करने पर विरचित होने वाले उत्पाद हैं, क्रमश:

Options :

8024371149. $[(\eta^6\text{-PhPMe}_2)\text{Mo}(\text{PMe}_2\text{Ph})_3]$ तथा $[(\eta^6\text{-PhPMe}_2)\text{Re}(\text{PMe}_2\text{Ph})_3]\text{Cl}$

8024371150. $[(\text{PMe}_2\text{Ph})_4\text{Mo}(\mu\text{-N}_2)_2\text{Mo}(\text{PMe}_2\text{Ph})_4]$ तथा $[(\text{PMe}_2\text{Ph})_4\text{Re}(\mu\text{-Cl})_2\text{Re}(\text{PMe}_2\text{Ph})_4]$

8024371151. $[(\eta^6\text{-PhPMe}_2)\text{Mo}(\text{PMe}_2\text{Ph})_3]$ तथा $[(\text{PMe}_2\text{Ph})_4\text{Re}(\mu\text{-Cl})_2\text{Re}(\text{PMe}_2\text{Ph})_4]$

8024371152. $[(\text{PMe}_2\text{Ph})_4\text{Mo}(\mu\text{-N}_2)_2\text{Mo}(\text{PMe}_2\text{Ph})_4]$ तथा $[(\eta^6\text{-PhPMe}_2)\text{Re}(\text{PMe}_2\text{Ph})_3]\text{Cl}$

Question Number : 64 Question Id : 802437289 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The products **A** and **B** for the given reaction

$[\text{Co}(\text{NH}_3)_5\text{Cl}]^{2+} + [\text{Cr}(\text{OH}_2)_6]^{2+} + 5\text{H}_3\text{O}^+ \rightarrow \mathbf{A} + \mathbf{B}$

are, respectively

Options :

8024371153. $[\text{Co}(\text{OH}_2)_5\text{Cl}]^+$, $[\text{Cr}(\text{OH}_2)_6]^{3+}$

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8024371154. $[Co(NH_3)_5(OH_2)]^{2+}$, $[Cr(OH_2)_5Cl]^{2+}$

8024371155. $[Co(OH_2)_6]^{2+}$, $[Cr(OH_2)_5Cl]^{2+}$

8024371156. $[Co(NH_3)_5Cl]^{+}$, $[Cr(OH_2)_6]^{3+}$

Question Number : 64 Question Id : 802437289 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

दी गई अभिक्रिया के उत्पाद **A** तथा **B** हैं, क्रमश:

$$[Co(NH_3)_5Cl]^{2+} + [Cr(OH_2)_6]^{2+} + 5H_3O^{+} \rightarrow \mathbf{A} + \mathbf{B}$$

Options :

8024371153. $[Co(OH_2)_5Cl]^{+}$, $[Cr(OH_2)_6]^{3+}$

8024371154. $[Co(NH_3)_5(OH_2)]^{2+}$, $[Cr(OH_2)_5Cl]^{2+}$

8024371155. $[Co(OH_2)_6]^{2+}$, $[Cr(OH_2)_5Cl]^{2+}$

8024371156. $[Co(NH_3)_5Cl]^{+}$, $[Cr(OH_2)_6]^{3+}$

Question Number : 65 Question Id : 802437290 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The calculated heat of formation (ΔH_f) for $NaCl_2$ and CaF is

Options :

8024371157. negative for both $NaCl_2$ and CaF

8024371158. negative for $NaCl_2$ but positive for CaF

8024371159. positive for $NaCl_2$ but negative for CaF

8024371160. positive for both $NaCl_2$ and CaF

Question Number : 65 Question Id : 802437290 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

$NaCl_2$ तथा CaF की परकलित विरचन ऊष्मा (ΔH_f) हैं

Options :

8024371157. ऋणात्मक $NaCl_2$ तथा CaF दोनों के लिए

8024371158. ऋणात्मक $NaCl_2$ के लिए तथा धनात्मक CaF के लिए

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8024371159. धनात्मक $NaCl_2$ के लिए तथा ऋणात्मक CaF के लिए

8024371160. धनात्मक $NaCl_2$ तथा CaF दोनों के लिए

Question Number : 66 Question Id : 802437291 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

As per the VSEPR theory, shapes of SO_3^{2-}, CO_3^{2-} and BrF_4^- are, respectively

Options :

8024371161. trigonal pyramidal, trigonal planar and tetrahedral

8024371162. trigonal planar, trigonal pyramidal and square planar

8024371163. trigonal pyramidal, trigonal planar and square planar

8024371164. trigonal planar, trigonal pyramidal and tetrahedral

Question Number : 66 Question Id : 802437291 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

VSEPR सिद्धांत के अनुसार SO_3^{2-}, CO_3^{2-} तथा BrF_4^- की आकृतियां हैं, क्रमश:

Options :

8024371161. त्रिसमनताक्ष पिरैमिडी, त्रिसमनताक्ष समतली तथा चतुष्फलकीय

8024371162. त्रिसमनताक्ष समतली, त्रिसमनताक्ष पिरैमिडी तथा वर्ग समतली

8024371163. त्रिसमनताक्ष पिरैमिडी, त्रिसमनताक्ष समतली तथा वर्ग समतली

8024371164. त्रिसमनताक्ष समतली, त्रिसमनताक्ष पिरैमिडी तथा चतुष्फलकीय

Question Number : 67 Question Id : 802437292 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Consider the following statements for Allred-Rochow electronegativity (χ_{AR}):

(i) χ_{AR} is directly proportional to Z_{eff}.

(ii) χ_{AR} is inversely proportional to Z_{eff}.

(iii) χ_{AR} is inversely proportional to r(covalent).

(iv) χ_{AR} is inversely proportional to r^2(covalent) .

The correct statements are

Options :

8024371165. (i) and (iv)

8024371166. (ii) and (iv)

8024371167. (i) and (iii)

8024371168. (ii) and (iii)

Question Number : 67 Question Id : 802437292 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

आल्रेड रोशी विद्युत ऋणात्मकता (χ_{AR}) के लिए निम्नलखित कथनों पर विचार कीजिए।

(i) χ_{AR} सीधी समानुपाती है Z_{eff} के।

(ii) χ_{AR} व्युत्क्रमानुपाती है Z_{eff} के।

(iii) χ_{AR} व्युत्क्रमानुपाती है r (सहसंयोजक)।

(iv) χ_{AR} व्युत्क्रमानुपाती है r^2 (सहसंयोजक)।

सही कथन हैं

Options :

8024371165. (i) तथा (iv)

8024371166. (ii) तथा (iv)

8024371167. (i) तथा (iii)

8024371168. (ii) तथा (iii)

Question Number : 68 Question Id : 802437293 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The reaction of XeF_6 with a limited amount of quartz gives compound **A**. Then on reaction with an equivalent amount of XeO_3, **A** gives **B**. The products **A** and **B** are, respectively

Options :

8024371169. $XeOF_2$ and XeO_2F_2

8024371170. $XeOF_4$ and XeO_2F_2

8024371171. $XeOF_2$ and $XeOF_4$

8024371172. XeO_2F_2 and $XeOF_4$

Question Number : 68 Question Id : 802437293 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

XeF_6 की स्फटिक की सीमित मात्रा से अभिक्रिया एक यौगिक **A** देती है। तत्पश्चात XeO_3 की तुल्य मात्रा A से अभिक्रिया करके B देती है। A तथा B हैं, क्रमश:

Options :

8024371169. $XeOF_2$ तथा XeO_2F_2

8024371170. $XeOF_4$ तथा XeO_2F_2

8024371171. $XeOF_2$ तथा $XeOF_4$

8024371172. XeO_2F_2 तथा $XeOF_4$

Question Number : 69 Question Id : 802437294 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The energies of interaction for (i) ion pair, (ii) ion-dipole, and (iii) dipole-dipole interactions are inversely proportional to

Options :

8024371173. r, r^2 and r^3 respectively

8024371174. r^2, r and r^3 respectively

8024371175. r, r^2 and r^6 respectively

8024371176. r^2, r and r^6 respectively

Question Number : 69 Question Id : 802437294 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

(i) आयन युग्म के मध्य अन्योनन्यक्रिया (ii) आयन-द्विध्रुव तथा (iii) द्विध्रुव-द्विध्रुव अन्योन्यक्रियाओं के लिए ऊर्जा व्युत्क्रमानुपाती है, क्रमश:

Options :

8024371173. r, r^2 तथा r^3 के

8024371174. r^2, r तथा r^3 के

8024371175. r, r^2 तथा r^6 के

8024371176. r^2, r तथा r^6 के

Question Number : 70 Question Id : 802437295 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The correct match for column A with column B is:

Column A	Column B
(a) f → f transition	(i) Tb^{3+}
(b) $^5D_0 \rightarrow {}^7F_n$ emission	(ii) Lu^{3+}
(c) $^5D_4 \rightarrow {}^7F_n$ emission	(iii) Sm^{3+}
(d) Overlapping *J* levels	(iv) Eu^{3+}

Options :

8024371177. (a) – (iv), (b) – (i), (c) – (ii), (d) – (iii)

8024371178. (a) – (ii), (b) – (iv), (c) – (iii), (d) – (i)

8024371179. (a) – (ii), (b) – (iv), (c) – (i), (d) – (iii)

8024371180. (a) – (i), (b) – (iii), (c) – (ii), (d) – (iv)

Question Number : 70 Question Id : 802437295 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

कॉलम A तथा कॉलम B का सही मिलान है

कॉलम A	कॉलम B
(a) f → f संक्रमण	(i) Tb^{3+}
(b) $^5D_0 \rightarrow {}^7F_n$ उत्सर्जन	(ii) Lu^{3+}
(c) $^5D_4 \rightarrow {}^7F_n$ उत्सर्जन	(iii) Sm^{3+}
(d) J स्तरों का अतिव्यापन	(iv) Eu^{3+}

Options :

8024371177. (a) – (iv), (b) – (i), (c) – (ii), (d) – (iii)

8024371178. (a) – (ii), (b) – (iv), (c) – (iii), (d) – (i)

8024371179. (a) – (ii), (b) – (iv), (c) – (i), (d) – (iii)

8024371180. (a) – (i), (b) – (iii), (c) – (ii), (d) – (iv)

Question Number : 71 Question Id : 802437296 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Thermometric titration gives best results when

A. $|\Delta H|$ is high

B. $\Delta G < 0$

C. Heat of mixing of titrant with titrand is high

D. Titrant is used as dilute solution

The answer is

Options :

8024371181. A and B

8024371182. B and C

8024371183. C and D

8024371184. A and D

Question Number : 71 Question Id : 802437296 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

तापमितीय अनुमापन सर्वोत्तम परिणाम देता है, जब

A. $|\Delta H|$ उच्च हो

B. $\Delta G < 0$

C. टाइट्रेन्ड तथा टाइट्रेन्ट को मिश्रित करने की ऊष्मा उच्च हो।

D. टाइट्रेन्ट का तनु विलयन प्रयोग किया जाए।

उत्तर है

Options :

8024371181. A तथा B

8024371182. B तथा C

8024371183. C तथा D

8024371184. A तथा D

Question Number : 72 Question Id : 802437297 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The geometry/shape of the Fe_4 core of the cluster $[Fe_4C(CO)_{12}]^{2-}$ is

Options :

8024371185. tetrahedron

8024371186. square pyramid

8024371187. butterfly

8024371188. trigonal bipyramid

Question Number : 72 Question Id : 802437297 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

$[Fe_4C(CO)_{12}]^{2-}$ में Fe_4 कोर की ज्यामिति/आकृति है

Options :

8024371185. चतुष्फलक

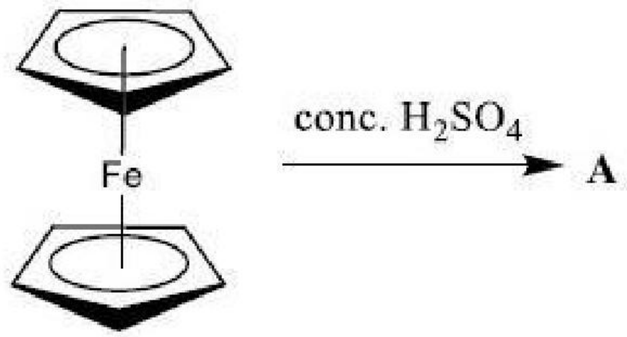
8024371186. वर्ग पिरैमिड

8024371187. तितली जैसी

8024371188. त्रिसमनताक्ष द्विपिरैमिड

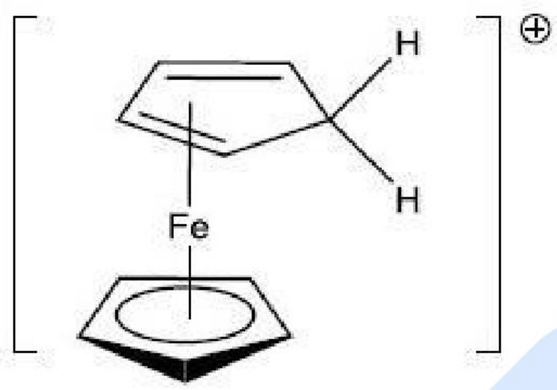
Question Number : 73 Question Id : 802437298 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The product **A** of the following reaction

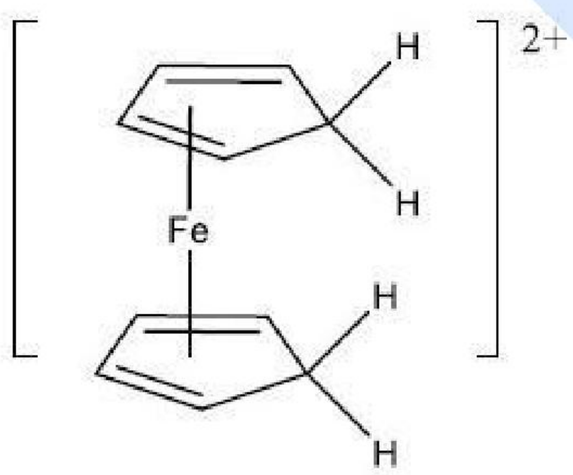


is

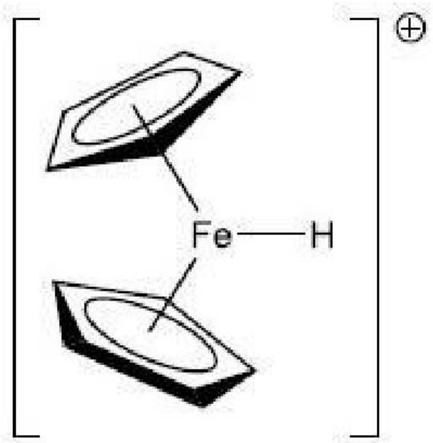
Options :



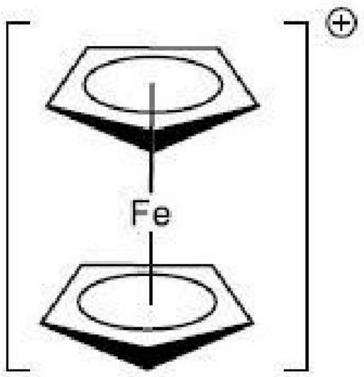
8024371189.



8024371190.



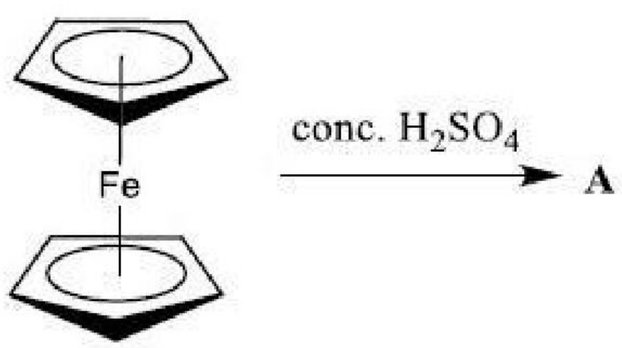
8024371191.



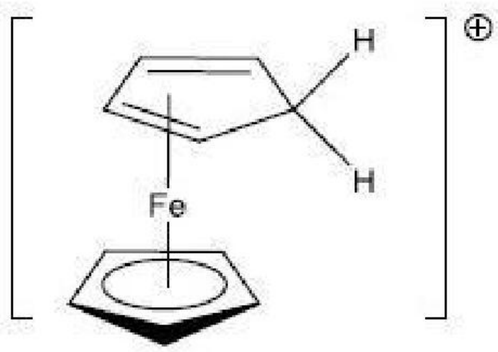
8024371192.

Question Number : 73 Question Id : 802437298 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

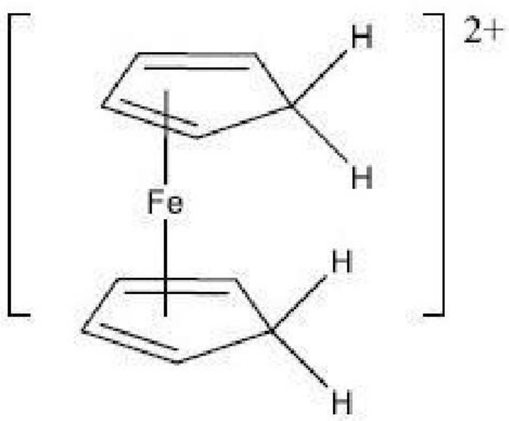
निम्नलिखित अभिक्रिया का उत्पाद A है



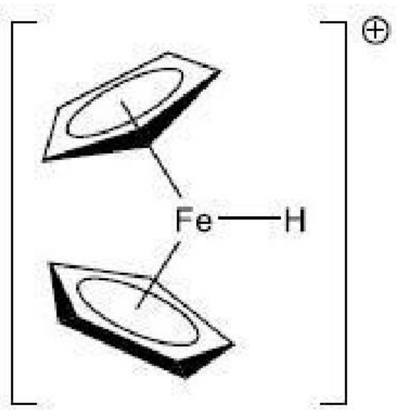
Options :



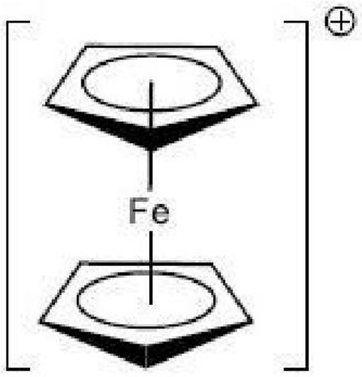
8024371189.



8024371190.



8024371191.

8024371192. 

Question Number : 74 Question Id : 802437299 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The number of peaks with relative intensities observed in the ^1H NMR spectra of $[(Cp)_2Fe(CO)_2]$ at +30 °C and –80 °C in diethyl ether are, respectively

Options :

8024371193. two peaks (1:1) and four peaks (5:2:2:1)

8024371194. one peak and two peaks (1:1)

8024371195. two peaks (1:1) at both the temperatures

8024371196. one peak and four peaks (5:2:2:1)

Question Number : 74 Question Id : 802437299 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

$[(Cp)_2Fe(CO)_2]$ के +30 °C तथा –80 °C पर डाइएथिल ईथर में ^1H NMR स्पेक्ट्रमों में प्रेक्षित शिखरों की संख्या सापेक्ष तीव्रता के साथ है, क्रमश:

Options :

8024371193. दो शिखर (1:1) तथा चार शिखर (5:2:2:1)

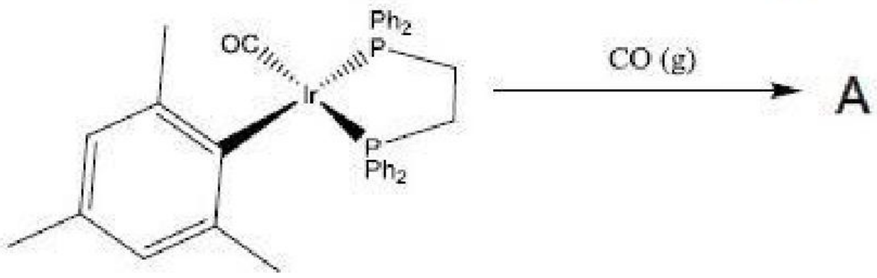
8024371194. एक शिखर तथा दो शिखर (1:1)

8024371195. दो शिखर (1:1) दोनों ताप पर

8024371196. एक शिखर तथा चार शिखर (5:2:2:1)

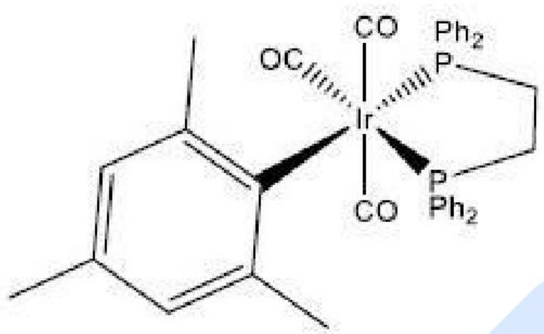
Question Number : 75 Question Id : 802437300 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The infrared (IR) spectrum of the product **A** for the following reaction

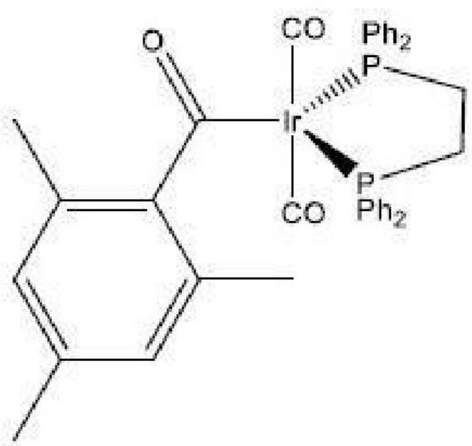


shows three **STRONG** bands at 1986 , 1935 and 1601 cm^{-1}. The correct structure of '**A**' is

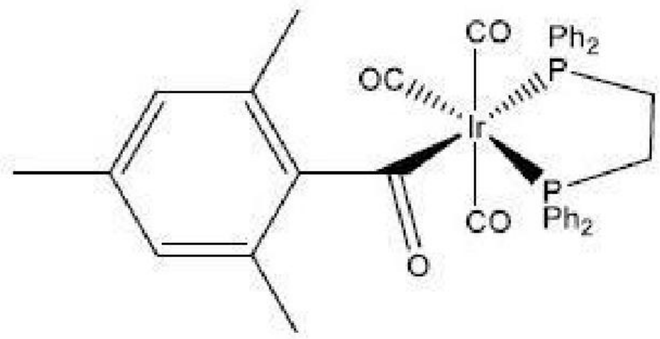
Options :



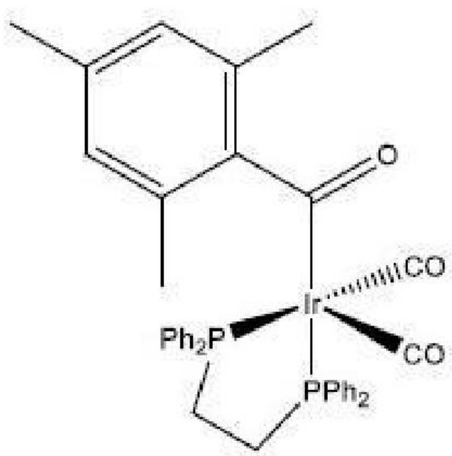
8024371197.



8024371198.



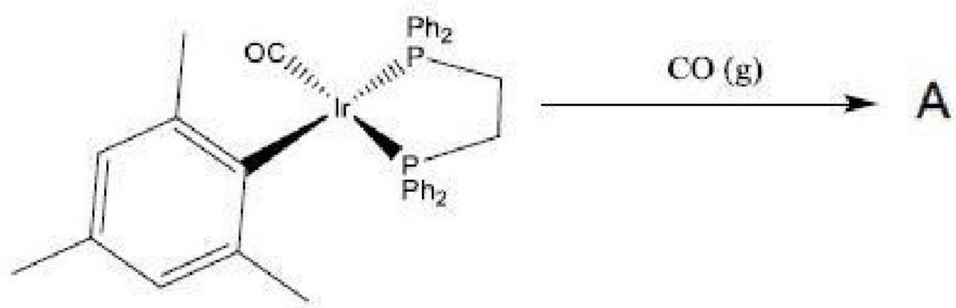
8024371199.



8024371200.

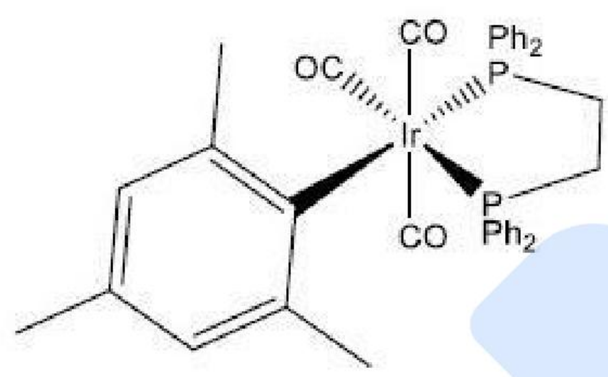
Question Number : 75 Question Id : 802437300 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया के उत्पाद A का अवरक्त (IR) स्पेक्ट्रम

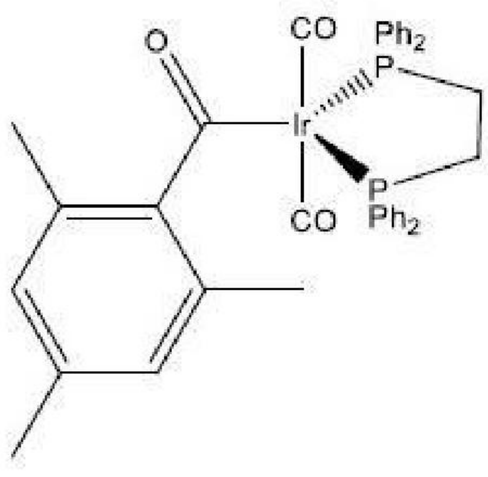


तीन प्रबल बैन्ड 1986 , 1935 तथा 1601 cm^{-1} पर दर्शाता है। 'A' की सही संरचना है

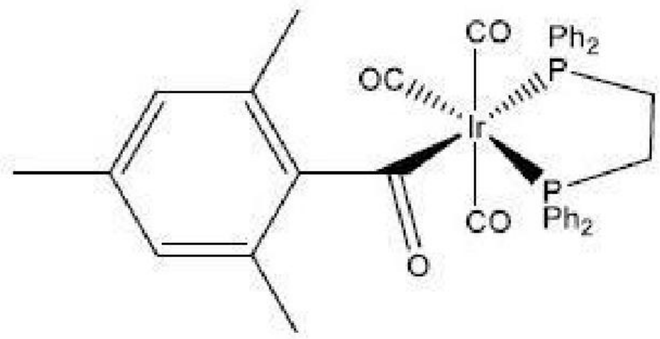
Options :



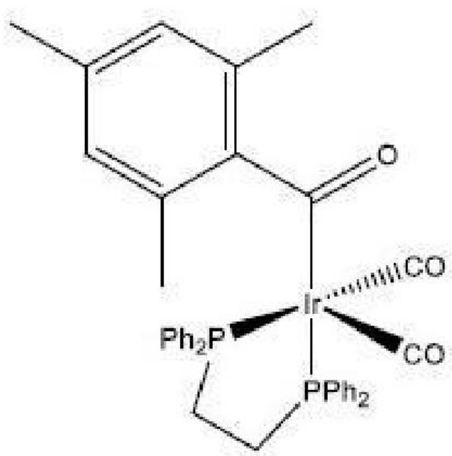
8024371197.



8024371198.



8024371199.



8024371200.

Question Number : 76 Question Id : 802437301 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The number of expected electronic transitions in $[Cr(en)_3]^{3+}$ and *trans*-$[Cr(en)_2F_2]^+$ at 4 K is, respectively (en = ethylenediamine)

Options :

8024371201. 3 and 3

8024371202. 3 and 4

8024371203. 3 and 5

8024371204. 3 and 6

Question Number : 76 Question Id : 802437301 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

4 K पर $[Cr(en)_3]^{3+}$ तथा *trans*-$[Cr(en)_2F_2]^+$ में प्रत्याशित इलेक्ट्रॉनिक संक्रमणों की संख्या है, क्रमश: (en = एथिलीनडाइऐमीन)

Options :

8024371201. 3 तथा 3

8024371202. 3 तथा 4

8024371203. 3 तथा 5

8024371204. 3 तथा 6

Question Number : 77 Question Id : 802437302 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The value of magnetic moment will be independent of temperature for

(acac = acetylacetonato; OAc = acetate; *o*-phen = *o*-phenathroline; Pz = pyrazolyl)

Options :

8024371205. $[Fe(acac)_3]$

8024371206. $[Cu_2(OAc)_4(H_2O)_2]$

8024371207. $[Fe(o\text{-phen})_2)(NCS)_2]$

8024371208. $[Fe\{HC(3,5\text{-}Me_2Pz)_3\}_2]^{2+}$

Question Number : 77 Question Id : 802437302 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

जिसमें चुम्बकीय आघूर्ण का मान तापक्रम से स्वतंत्र होगा, वह है

(acac = ऐसीटिलऐसीटोनटो; OAc = ऐसीटेट; *o*- phen = *o*-फिनेंथ्रोलीन;

Pz = पाइरैजोलाइल)

Options :

8024371205. $[Fe(acac)_3]$

8024371206. $[Cu_2(OAc)_4(H_2O)_2]$

8024371207. $[Fe(o\text{-phen})_2)(NCS)_2]$

8024371208. $[Fe\{HC(3,5\text{-}Me_2Pz)_3\}_2]^{2+}$

Question Number : 78 Question Id : 802437303 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Choose the correct statements for the Group 15 halides:

(i) $AsCl_3$ can form complexes of type $[AsCl_4]^-$ in the presence of a chloride source

(ii) PF_3 acts as a strong σ–donor ligand towards d-metals

(iii) In the solid state, SbF_5 has a trigonal bipyramidal structure

(iv) The reaction of SbF_5 with anhydrous HF generates $[H_2F]^+$ ions

Options :

8024371209. (i) and (iv)

8024371210. (ii), (iii) and (iv)

8024371211. (i), (iii) and (iv)

8024371212. (ii) and (iii)

Question Number : 78 Question Id : 802437303 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

ग्रुप 15 के हैलाइडों के लिए सही कथन चुनिए:

(i) क्लोराइड के स्त्रोत की उपस्थिति में $[AsCl_4]^-$ प्रकार का संकुल $AsCl_3$ विरचित कर सकता है।

(ii) PF_3 एक प्रबल σ–दाता लिगन्ड का कार्य d-धातुओं के प्रति करता है।

(iii) ठोस अवस्था में SbF_5 की संरचना त्रिसमनताक्ष द्विपिरैमिडी है।

(iv) SbF_5 की निर्जल HF से अभिक्रिया $[H_2F]^+$ आयनों को उत्पन्न करती है।

Options :

8024371209. (i) तथा (iv)

8024371210. (ii), (iii) तथा (iv)

8024371211. (i), (iii) तथा(iv)

8024371212. (ii) तथा (iii)

Question Number : 79 Question Id : 802437304 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

In the catalytic cycle of Cytochrome P450, the generation of $[(porphyrin)^{+\bullet}Fe^{IV}(O)]$ from $[(porphyrin)Fe^{III}(OOH)]$ involves

Options :

8024371213. One electron oxidation of $[(porphyrin)Fe^{III}(OOH)]$

8024371214. Formation of the intermediate $[(porphyrin)Fe^{IV}(OH)]$

8024371215. Homolytic O–O cleavage of $[(porphyrin)Fe^{IV}(OOH)]$

8024371216. Heterolytic O–O cleavage of $[(porphyrin)Fe^{III}(OOH)]$

Question Number : 79 Question Id : 802437304 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

साइटोक्रोम P450 के उत्प्रेरकी चक्र में [(porphyrin)Fe^{III}(OOH)] से [(porphyrin)$^{+\bullet}Fe^{IV}$(O)] उत्पन्न होने में सम्मिलित है

Options :

8024371213. [(porphyrin)Fe^{III}(OOH)] का एक इलेक्ट्रॉन ऑक्सीकरण

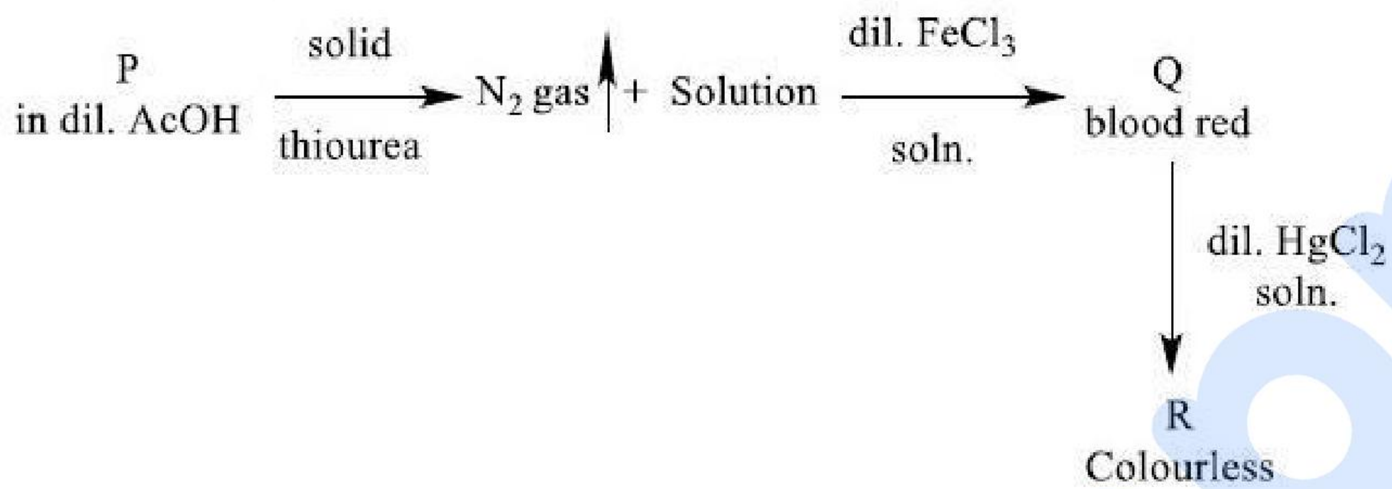
8024371214. मध्यवर्ती [(porphyrin)Fe^{IV}(OH)] का विरचन

8024371215. [(porphyrin)Fe^{IV}(OOH)] का O–O समांश विदलन

8024371216. [(porphyrin)Fe^{III}(OOH)] का O–O विषमांश विदलन

Question Number : 80 Question Id : 802437305 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

In the following sequence of reactions the correct **P**, **Q** and **R** are respectively



Options :

8024371217. KNO_2, CO_2, $[Fe(H_2O)_5S]^+$, HgS

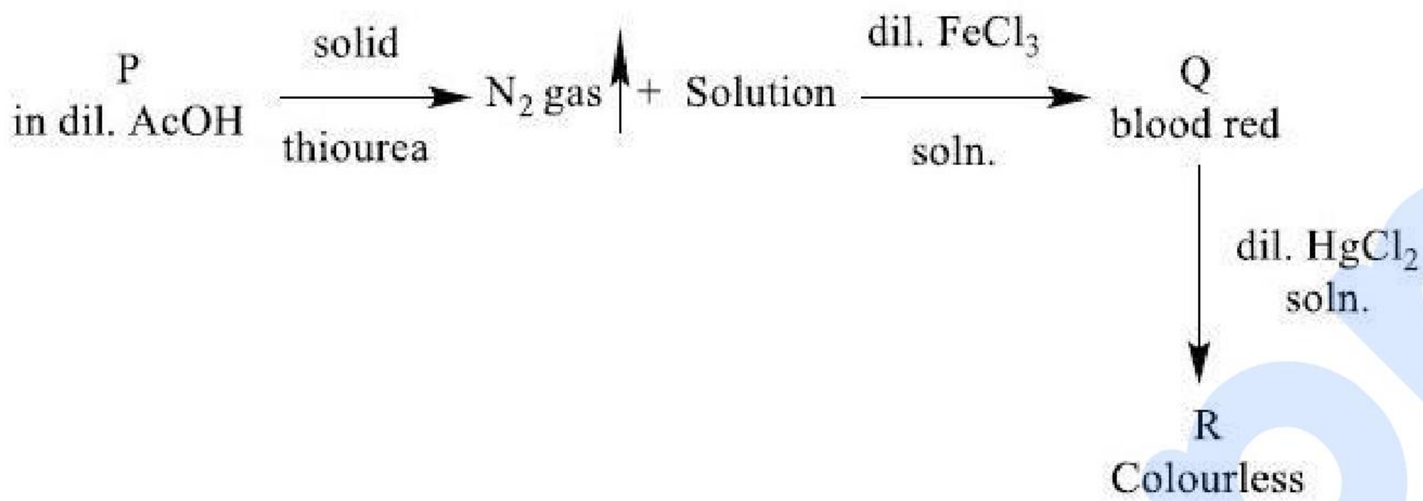
8024371218. KNO_2, N_2, $[Fe(H_2O)_5(SCN)]^{2+}$, $[Hg(SCN)_4]^{2-}$

8024371219. KNO_3, N_2, $[Fe(H_2O)_5(CN)]^{2+}$, $[Hg(OCN)_4]^{2-}$

8024371220. NaN_3, N_2, $[Fe(H_2O)_5(N_3)]^{2+}$, $[Hg(N_3)_4]^{2-}$

Question Number : 80 Question Id : 802437305 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रियाओं के क्रम में P, Q तथा R हैं, क्रमश:



Options :

8024371217. KNO_2, CO_2, $[Fe(H_2O)_5S]^+$, HgS

8024371218. KNO_2, N_2, $[Fe(H_2O)_5(SCN)]^{2+}$, $[Hg(SCN)_4]^{2-}$

8024371219. KNO_3, N_2, $[Fe(H_2O)_5(CN)]^{2+}$, $[Hg(OCN)_4]^{2-}$

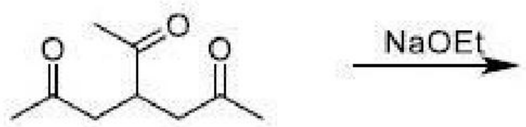
8024371220. NaN_3, N_2, $[Fe(H_2O)_5(N_3)]^{2+}$, $[Hg(N_3)_4]^{2-}$

Sub-Section Number :	2
Sub-Section Id :	80243716
Question Shuffling Allowed :	Yes

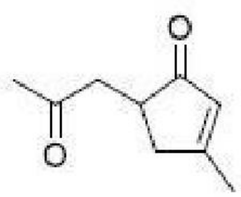
Question Number : 81 Question Id : 802437306 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

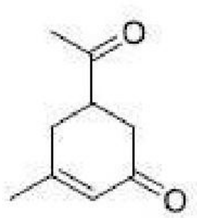
The major product formed in the following reaction is



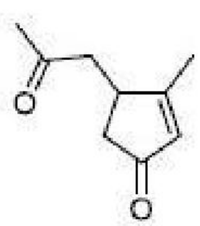
Options :



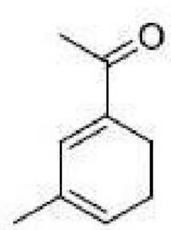
8024371221.



8024371222.



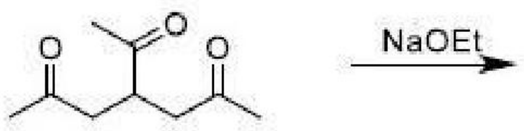
8024371223.



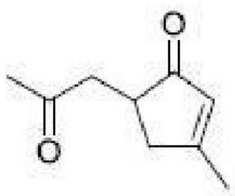
8024371224.

Question Number : 81 Question Id : 802437306 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

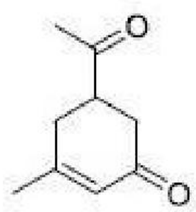
निम्नलिखित अभिक्रिया में विरचित मुख्य उत्पाद है



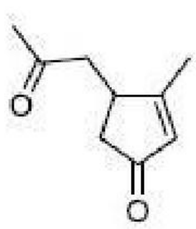
Options :



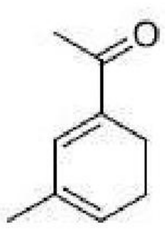
8024371221.



8024371222.



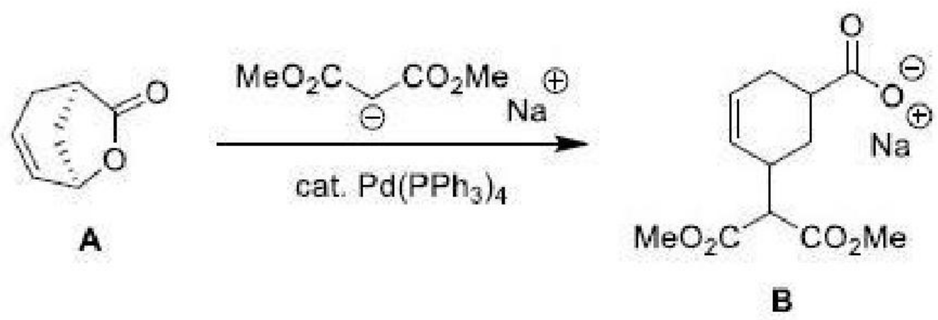
8024371223.



8024371224.

Question Number : 82 Question Id : 802437307 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

In the following transformation, the enantiomerically pure lactone **A** provides



Options :

8024371225. equimolar amounts of *syn*- and *anti*-diastereomers of **B**, both of which are racemic

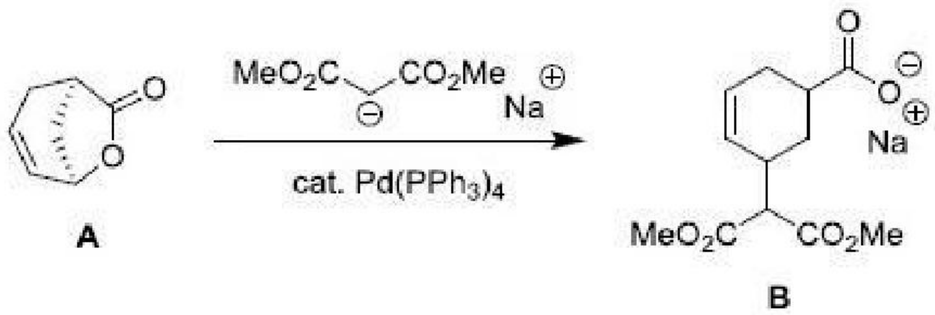
8024371226. equimolar amounts of *syn*- and *anti*-diastereomers of **B**, both of which are enantiomerically pure

8024371227. only *syn*-diastereomer of **B**, which is racemic

8024371228. only *anti*-diastereomer of **B**, which is enantiomerically pure

Question Number : 82 Question Id : 802437307 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

निम्नलिखित रूपांतरण में ऐनैन्टिओमरिक रूप से शुद्ध लैक्टोन A देता है



Options :

B के *syn*- तथा *anti*-अप्रतिबिंबी त्रिविम समावयवों की सम-मोलर मात्रा, जो कि रेसिमिक होते हैं

8024371225.

B के *syn*- तथा *anti*-अप्रतिबिंबी त्रिविम समावयवों की सम-मोलर मात्रा जो कि ऐनैन्टिओमरिक रूप से शुद्ध होते हैं

8024371226.

B का केवल *syn*- अप्रतिबिंबी त्रिविम समावयव जो रेसिमिक है

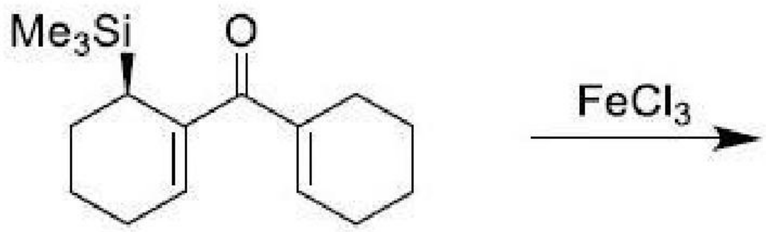
8024371227.

B का केवल *syn*- अप्रतिबिंबी त्रिविम समावयव जो ऐनैन्टिओमरिक रूप से शुद्ध है

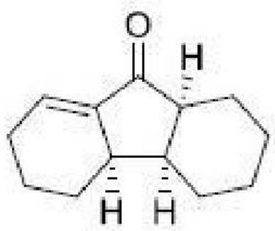
8024371228.

Question Number : 83 Question Id : 802437308 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

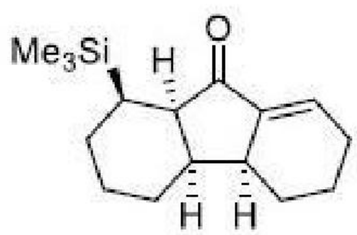
The major product formed in the following transformation is



Options :

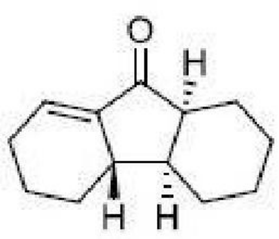


8024371229.



8024371230.

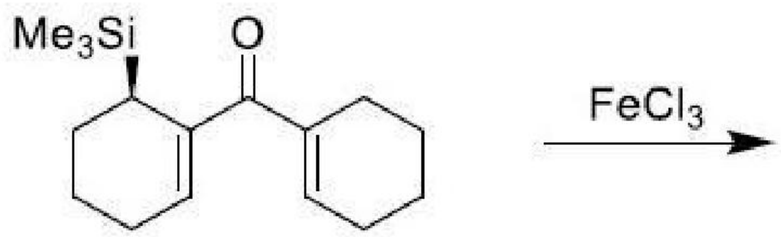
8024371231.



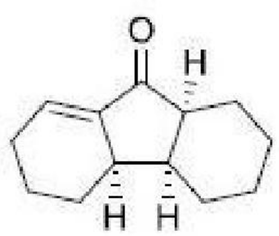
8024371232.

Question Number : 83 Question Id : 802437308 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

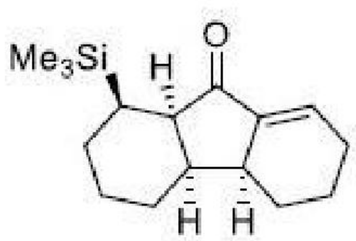
निम्नलिखित रूपांतरण में विरचित मुख्य उत्पाद है



Options :

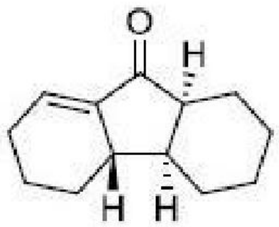


8024371229.



8024371230.

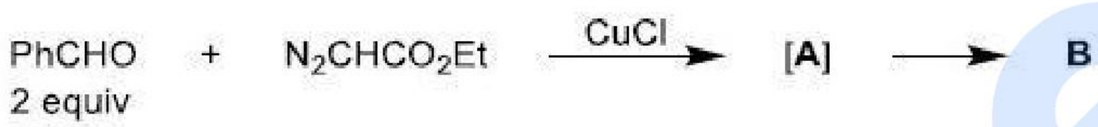
8024371231.



8024371232.

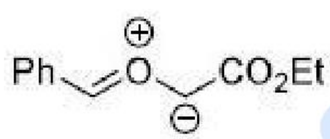
Question Number : 84 Question Id : 802437309 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

In the given transformation, the intermediate **[A]** and the major product **B** are

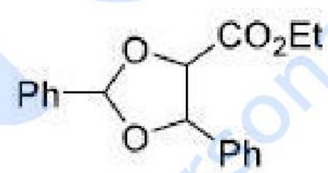


Options :

A =

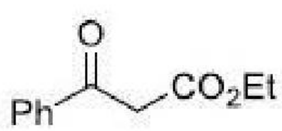


B =

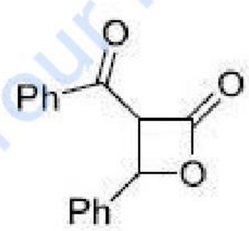


8024371233.

A =

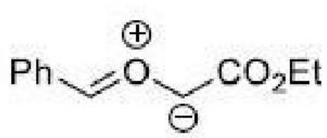


B =

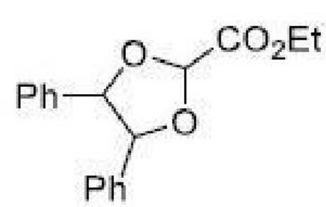


8024371234.

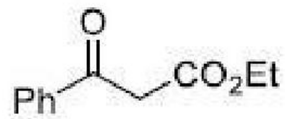
A =

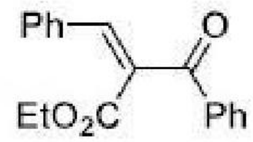


B =



8024371235.

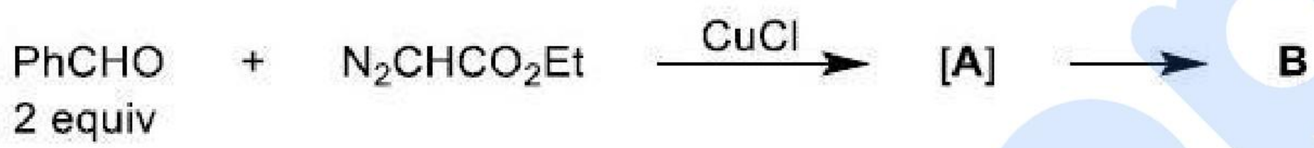
A = 

B = 

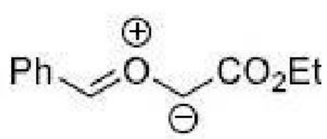
8024371236.

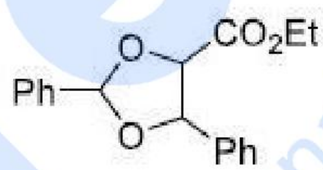
Question Number : 84 Question Id : 802437309 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

निम्नलिखित रूपांतरण में मध्यवर्ती [A] तथा मुख्य उत्पाद B हैं

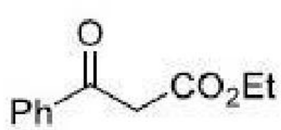


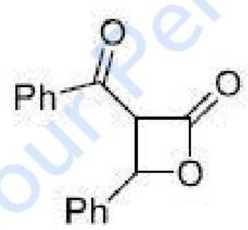
Options :

A = 

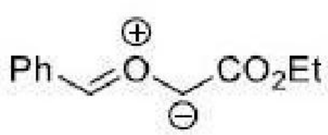
B = 

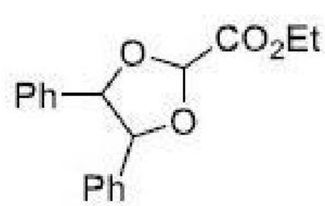
8024371233.

A = 

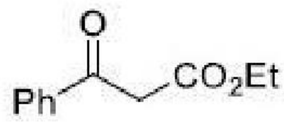
B = 

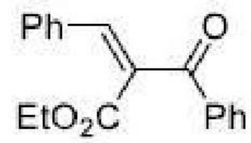
8024371234.

A = 

B = 

8024371235.

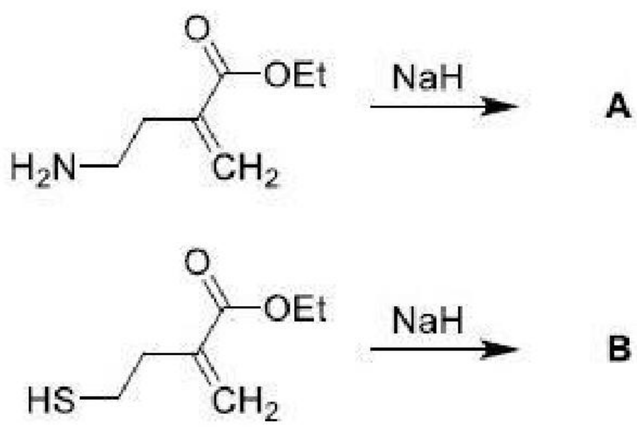
A = 

B = 

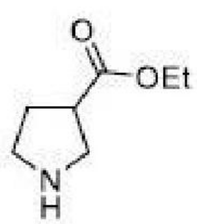
8024371236.

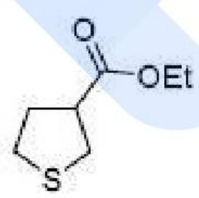
Question Number : 85 Question Id : 802437310 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The major products **A** and **B** formed in the following transformations are

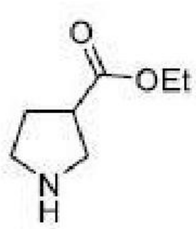


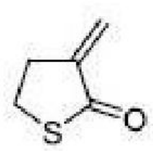
Options :

A = 

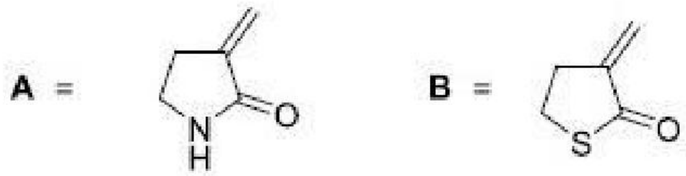
B = 

8024371237.

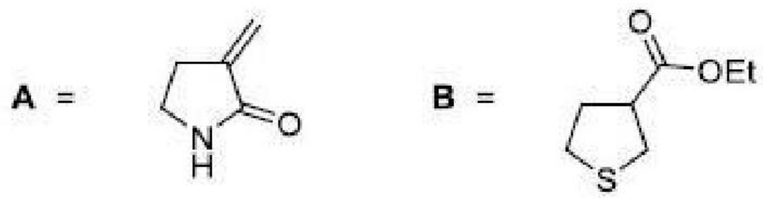
A = 

B = 

8024371238.



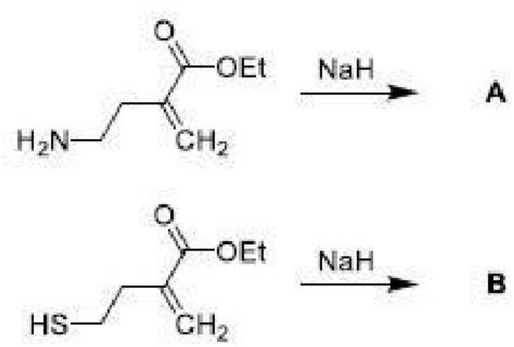
8024371239.



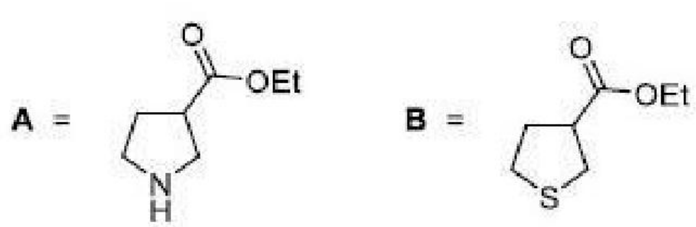
8024371240.

Question Number : 85 Question Id : 802437310 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

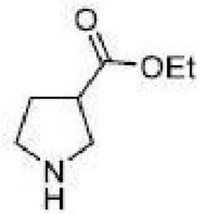
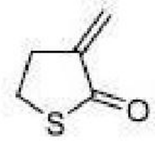
निम्नलिखित रूपांतरणों में विरचित मुख्य उत्पाद A तथा B हैं

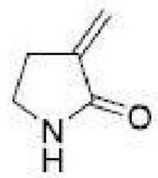
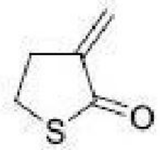


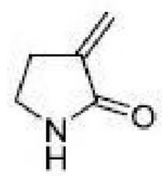
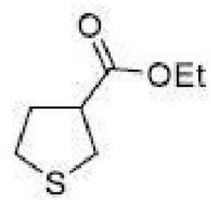
Options :



8024371237.

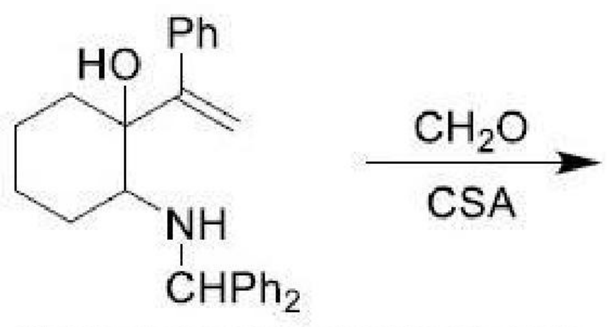
8024371238. A =  B = 

8024371239. A =  B = 

8024371240. A =  B = 

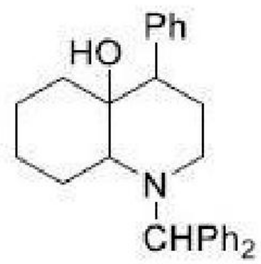
Question Number : 86 Question Id : 802437311 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The major product formed in the following reaction is

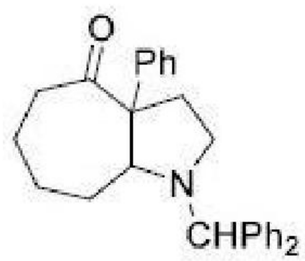


CSA = camphorsulfonic acid

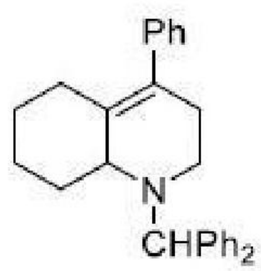
Options :



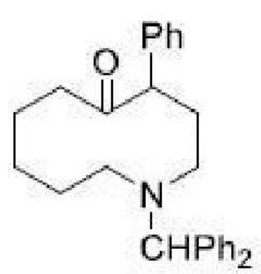
8024371241.



8024371242.



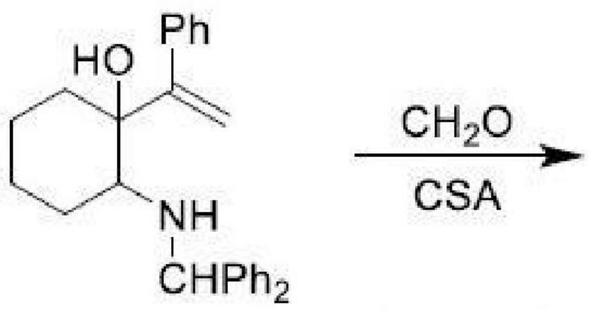
8024371243.



8024371244.

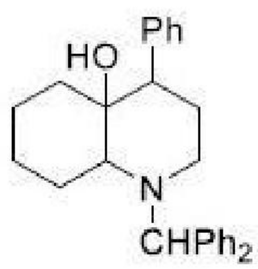
Question Number : 86 Question Id : 802437311 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया में विरचित मुख्य उत्पाद है

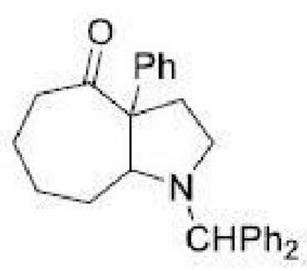


CSA = camphorsulfonic acid

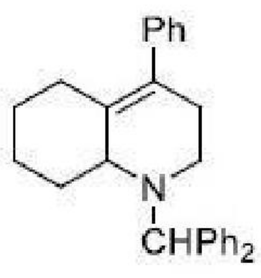
Options :



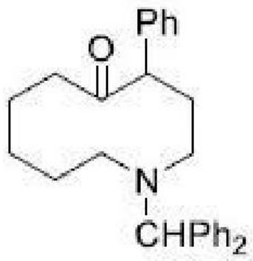
8024371241.



8024371242.



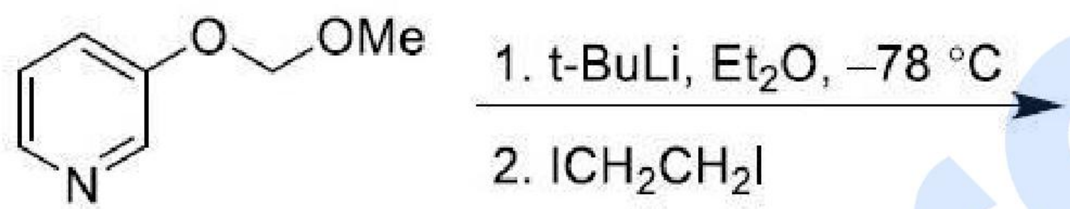
8024371243.



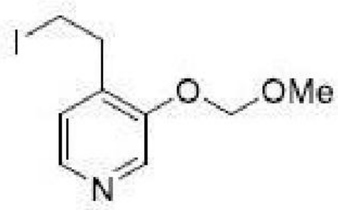
8024371244.

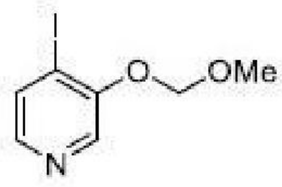
Question Number : 87 Question Id : 802437312 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

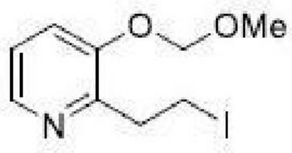
The major product formed in the following reaction sequence is

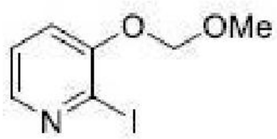


Options :

8024371245. 

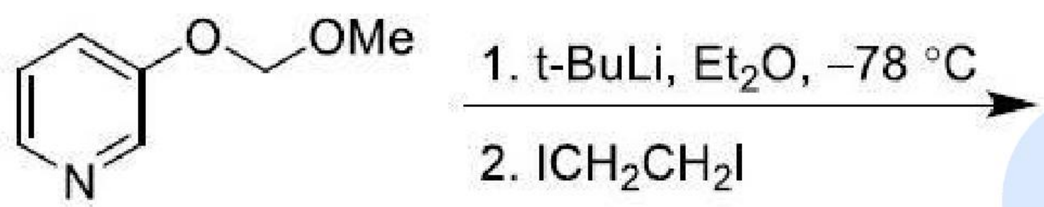
8024371246. 

8024371247. 

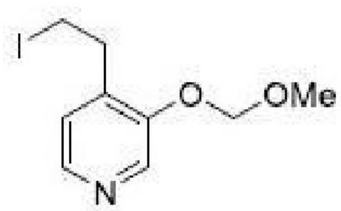
8024371248. 

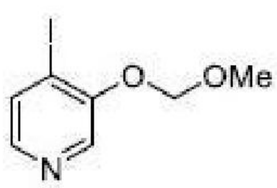
Question Number : 87 Question Id : 802437312 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

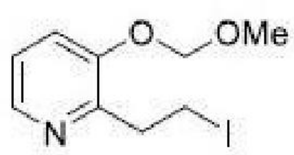
निम्नलिखित अभिक्रिया क्रम में विरचित मुख्य उत्पाद है

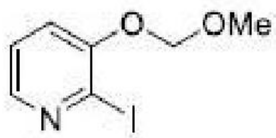


Options :

8024371245. 

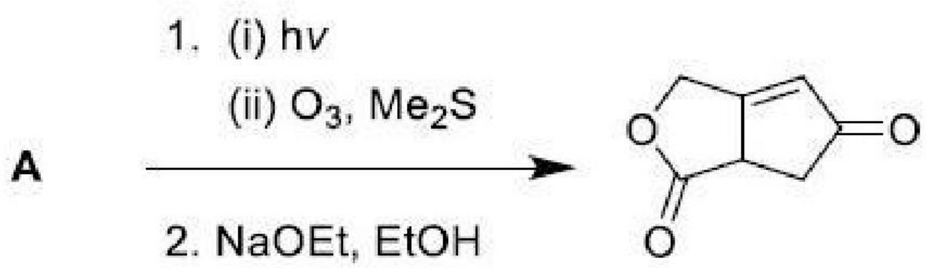
8024371246. 

8024371247. 

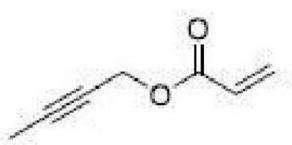
8024371248. 

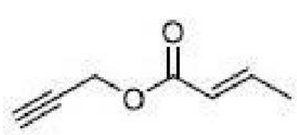
Question Number : 88 Question Id : 802437313 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

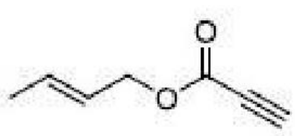
The structure of **A** in the following reaction is

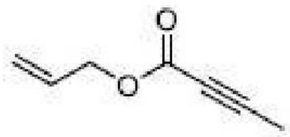


Options :

8024371249. 

8024371250. 

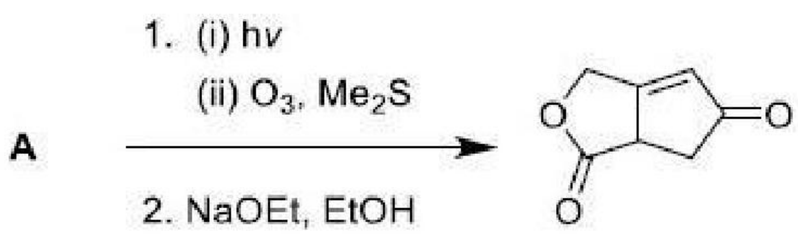
8024371251. 



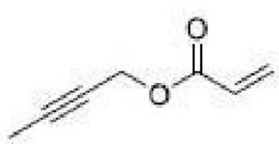
8024371252.

Question Number : 88 Question Id : 802437313 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

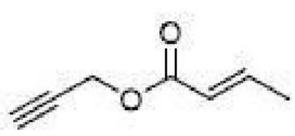
निम्नलिखित अभिक्रिया में A की संरचना है



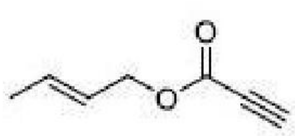
Options :



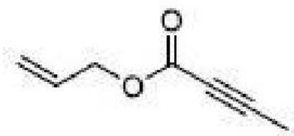
8024371249.



8024371250.



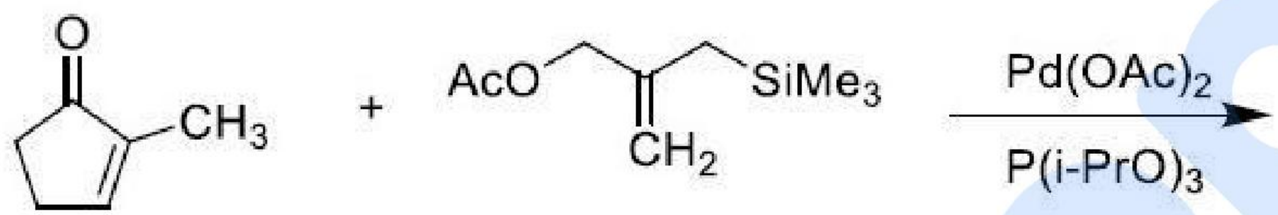
8024371251.



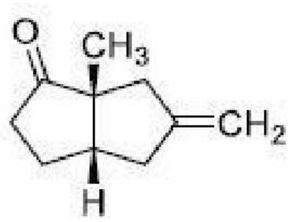
8024371252.

Question Number : 89 Question Id : 802437314 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

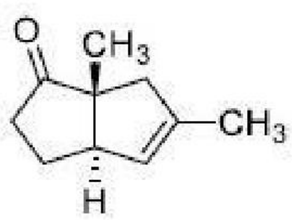
The major product formed in the following reaction is



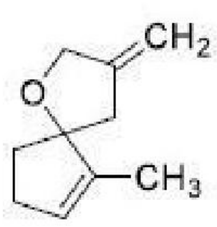
Options :



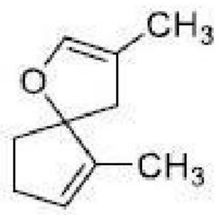
8024371253.



8024371254.



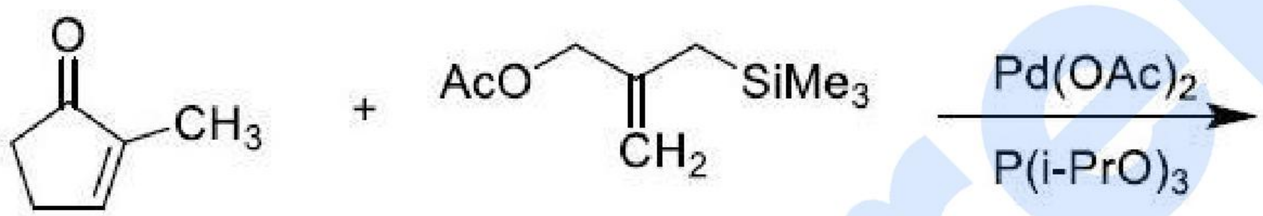
8024371255.



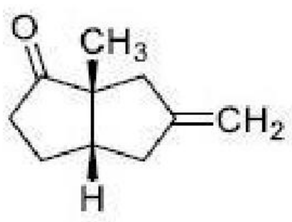
8024371256.

Question Number : 89 Question Id : 802437314 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

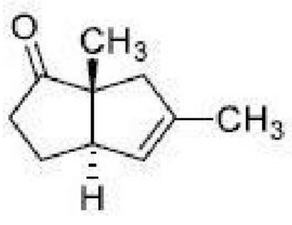
निम्नलिखित अभिक्रिया में विरचित मुख्य उत्पाद है



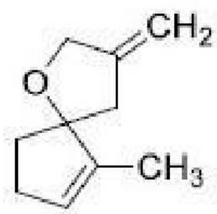
Options :

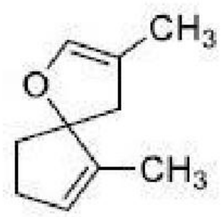


8024371253.



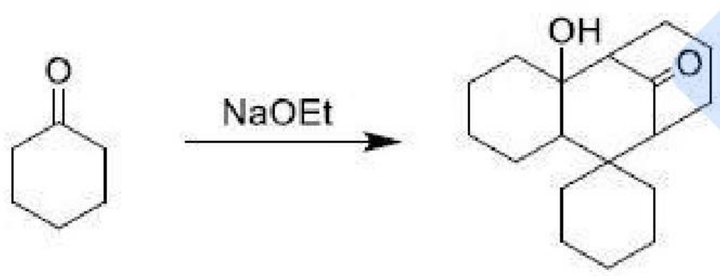
8024371254.

8024371255. 

8024371256. 

Question Number : 90 Question Id : 802437315 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The correct sequence of reactions involved in the following transformation is



Options :

8024371257. aldol condensation, Michael addition, aldol reaction

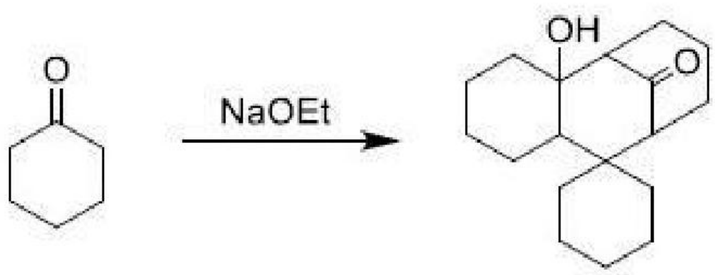
8024371258. aldol condensation, aldol reaction, Michael addition

8024371259. Michael addition, aldol condensation, aldol reaction

8024371260. aldol condensation, Michael addition, Michael addition

Question Number : 90 Question Id : 802437315 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

निम्नलिखित रूपांतरण करने के लिए आवश्यक अभिक्रियाओं का सही क्रम है



Options :

8024371257. ऐल्डोल संघनन, माइकेल संकलन, ऐल्डोल अभिक्रिया

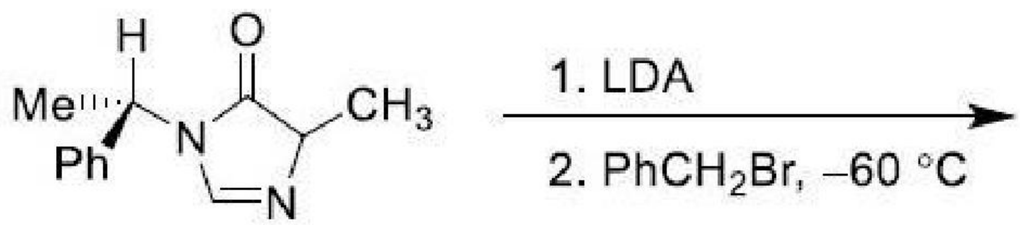
8024371258. ऐल्डोल संघनन, ऐल्डोल अभिक्रिया , माइकेल संकलन

8024371259. माइकेल संकलन, ऐल्डोल संघनन, ऐल्डोल अभिक्रिया

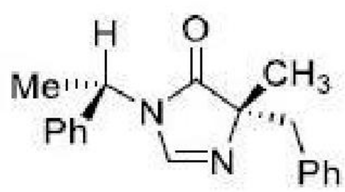
8024371260. ऐल्डोल संघनन, माइकेल संकलन, माइकेल संकलन

Question Number : 91 Question Id : 802437316 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

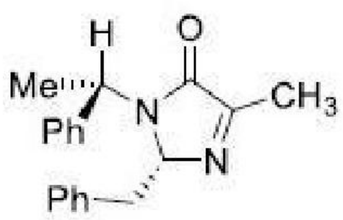
The major products formed in the following reaction is



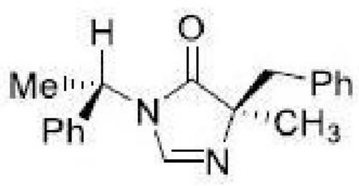
Options :



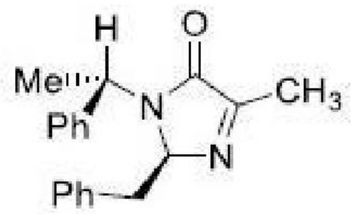
8024371261.



8024371262.



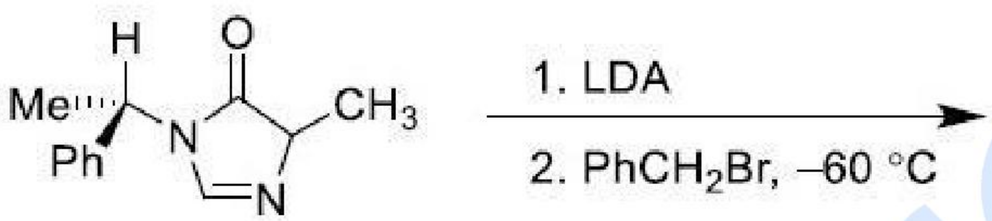
8024371263.



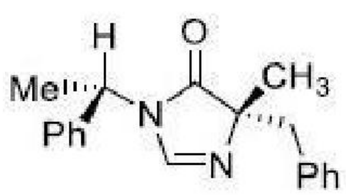
8024371264.

Question Number : 91 Question Id : 802437316 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

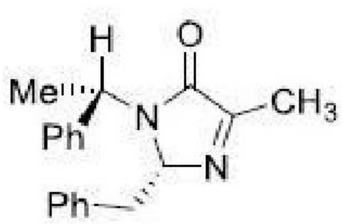
निम्नलिखित अभिक्रिया में विरचित मुख्य उत्पाद है



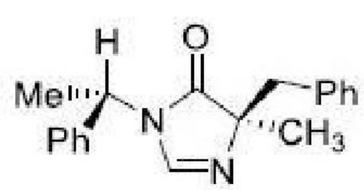
Options :



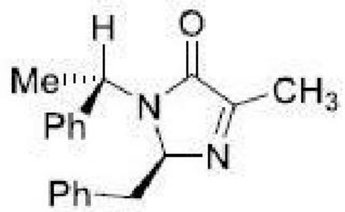
8024371261.



8024371262.



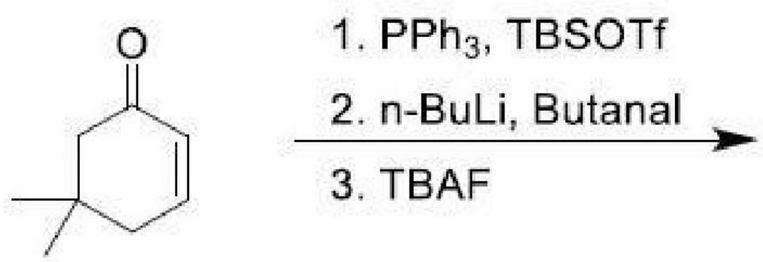
8024371263.



8024371264.

Question Number : 92 Question Id : 802437317 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

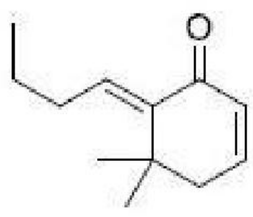
The major product formed in the following reaction is



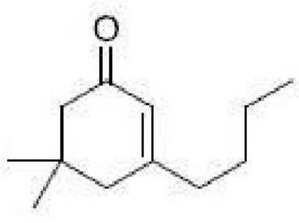
TBSOTf = t-Butyldimethylsilyl triflate

TBAF = tetra-n-butylammonium fluoride

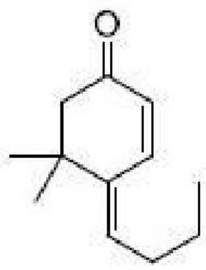
Options :



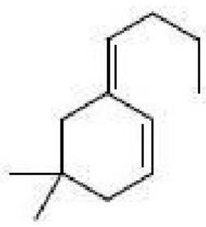
8024371265.



8024371266.



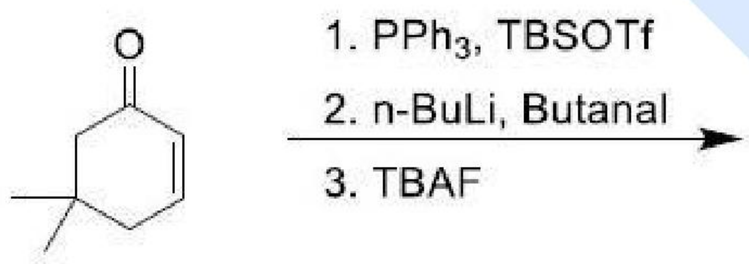
8024371267.



8024371268.

Question Number : 92 Question Id : 802437317 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

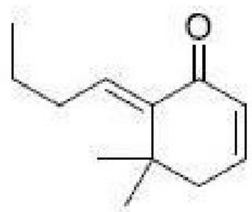
निम्नलिखित अभिक्रिया में विरचित मुख्य उत्पाद है



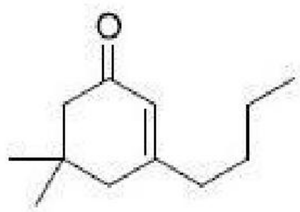
TBSOTf = t-Butyldimethylsilyl triflate

TBAF = tetra-n-butylammonium fluoride

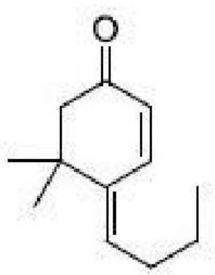
Options :



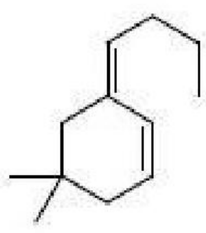
8024371265.



8024371266.



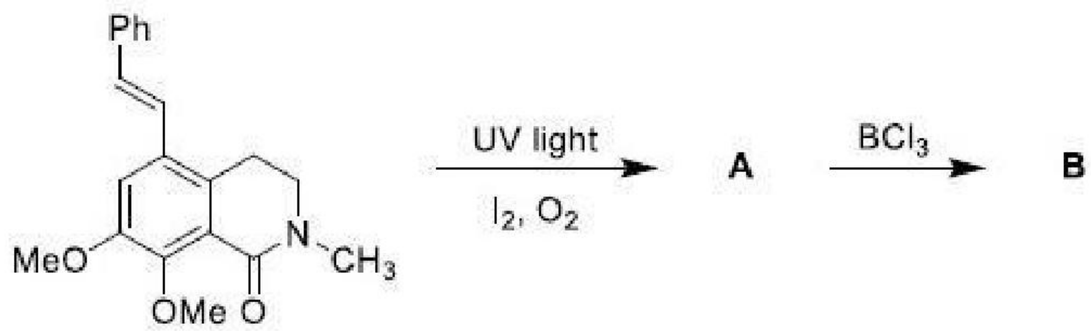
8024371267.



8024371268.

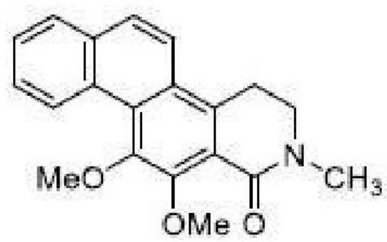
Question Number : 93 Question Id : 802437318 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The major products **A** and **B** formed in the following reactions are

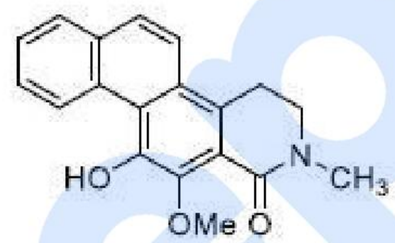


Options :

A =

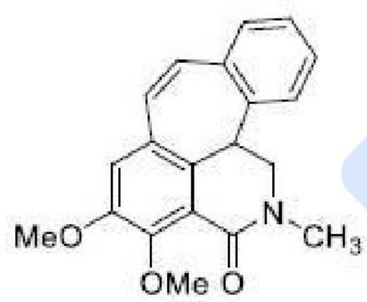


B =

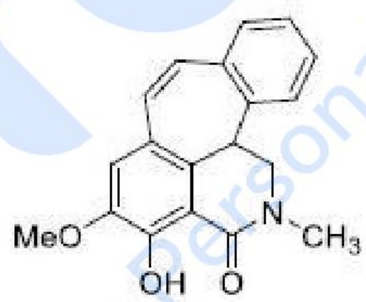


8024371269.

A =

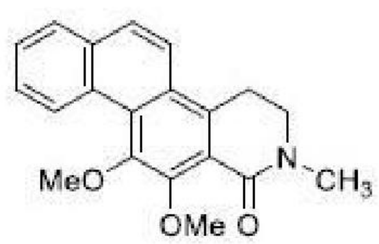


B =

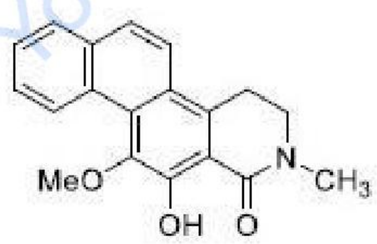


8024371270.

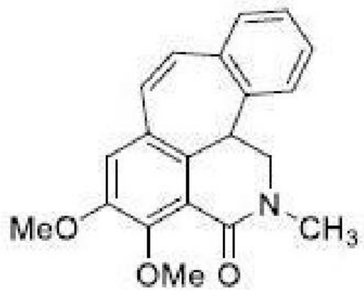
A =



B =



8024371271.

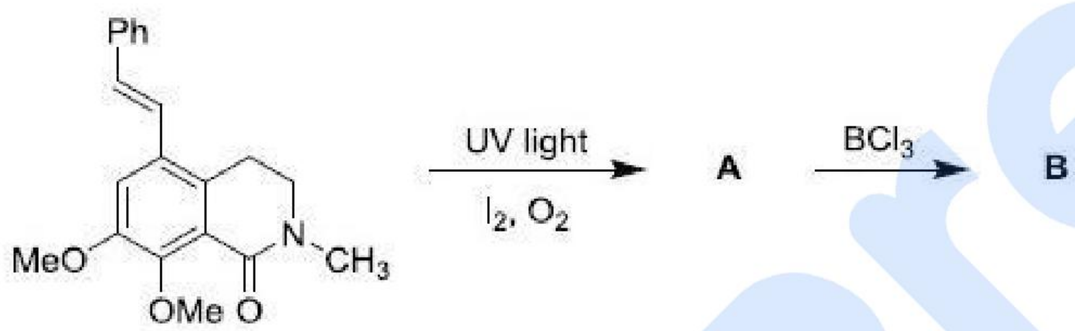
A = 

B =

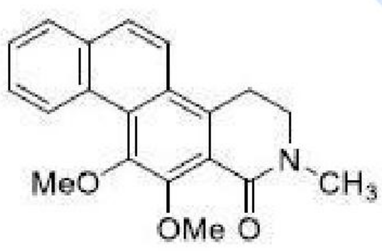
8024371272.

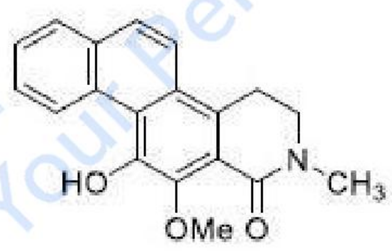
Question Number : 93 Question Id : 802437318 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रियाओं में विरचित मुख्य उत्पाद A तथा B हैं

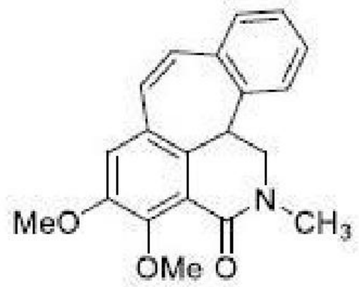


Options :

A = 

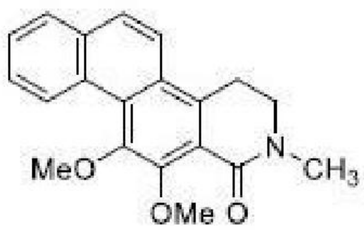
B = 

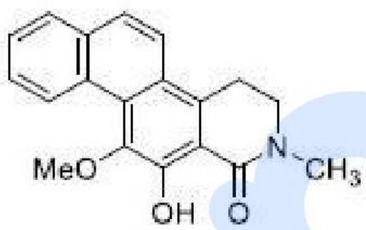
8024371269.

A = 

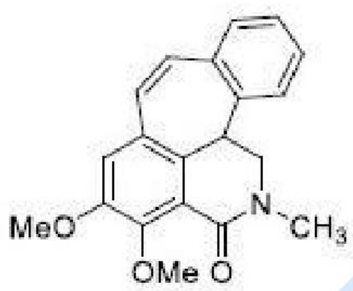
B =

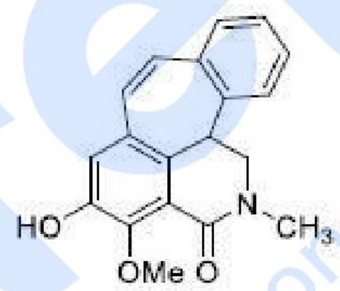
8024371270.

A = 

B = 

8024371271.

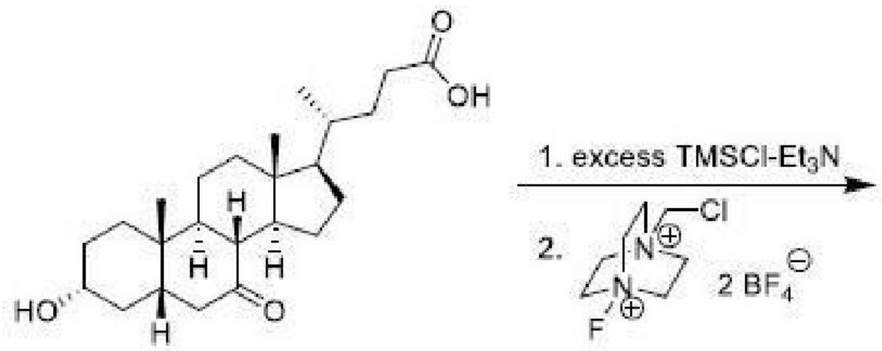
A = 

B = 

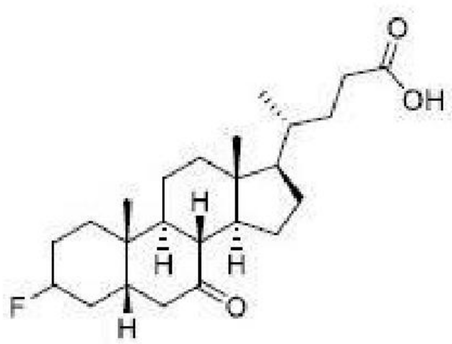
8024371272.

Question Number : 94 Question Id : 802437319 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

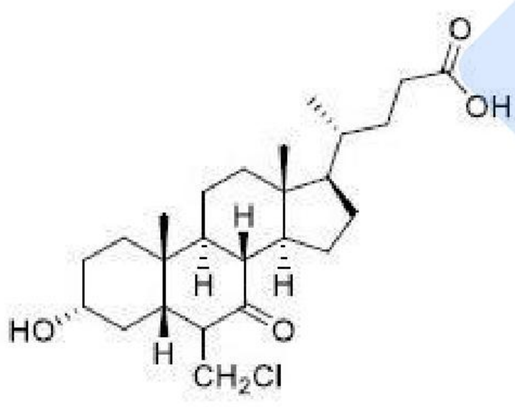
The major product formed in the following reaction is



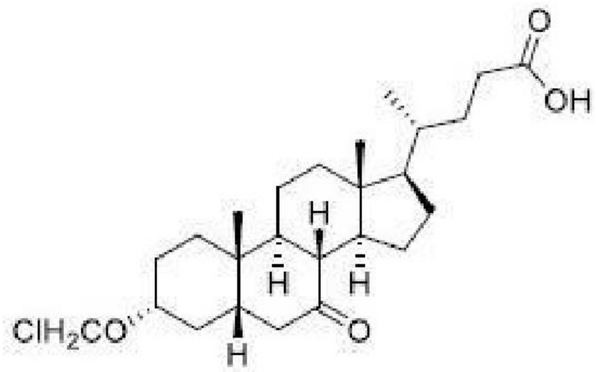
Options :



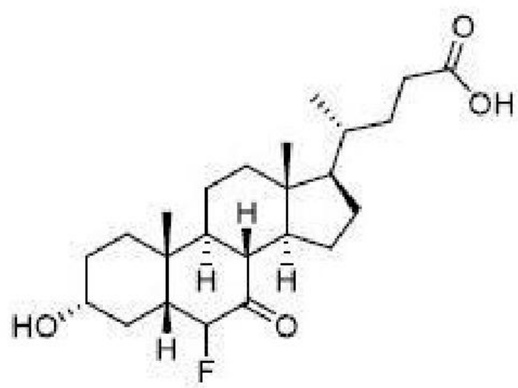
8024371273.



8024371274.



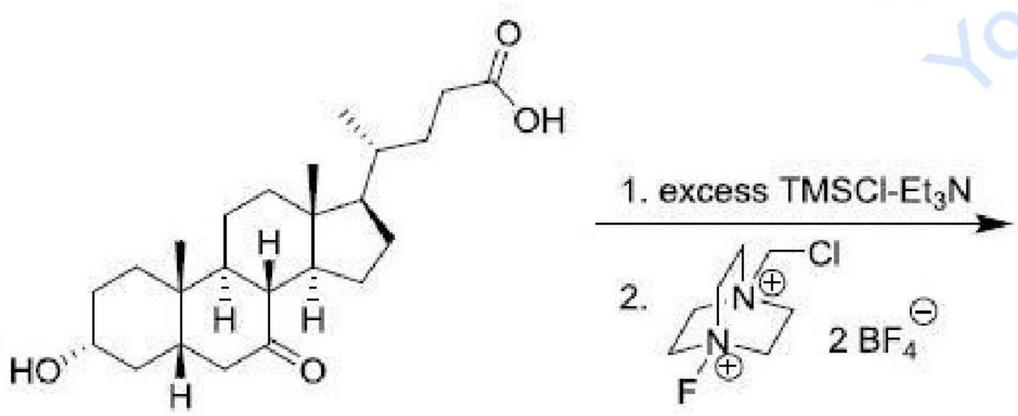
8024371275.



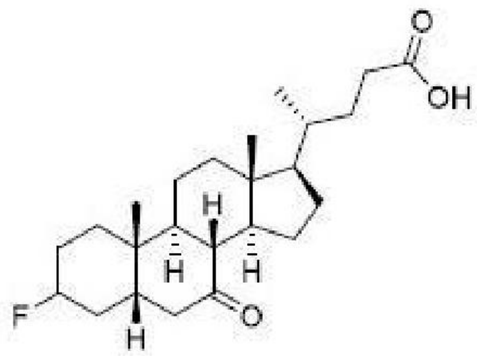
8024371276.

Question Number : 94 Question Id : 802437319 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

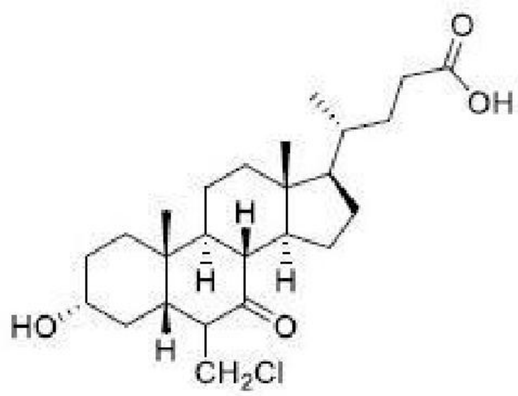
निम्नलिखित अभिक्रिया में विरचित मुख्य उत्पाद है



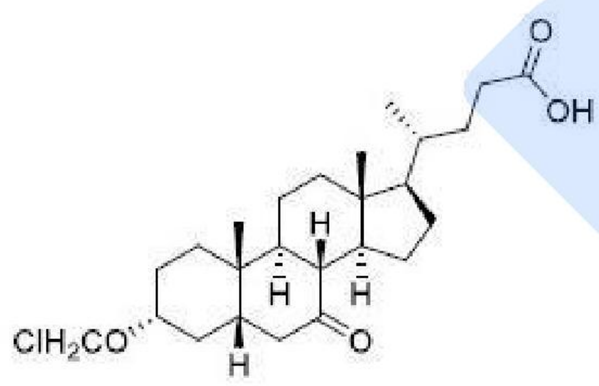
Options :



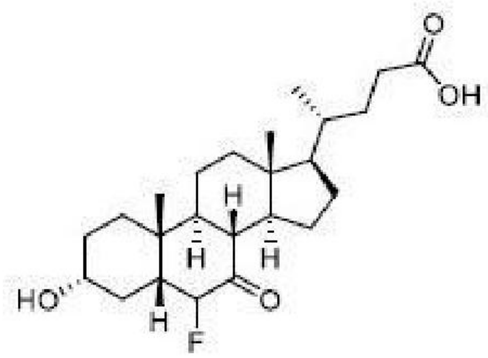
8024371273.



8024371274.



8024371275.



8024371276.

Question Number : 95 Question Id : 802437320 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

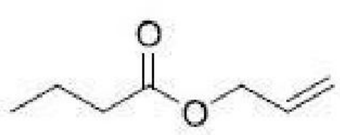
The compound that exhibits the following spectral data is

IR (υ_{max}): 1740 cm^{-1}

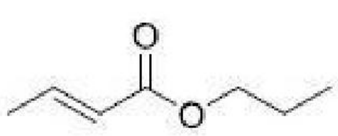
^{1}H NMR: δ 0.9 (t, 3H), 1.6 (sext, 2H), 2.3 (t, 2H), 4.6 (d, 2H), 5.2 (d, 1H), 5.4 (d, 1H), 5.9 (m, 1H) ppm

EI-MS (*m/z*): 71 (100%)

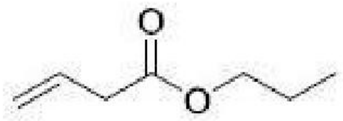
Options :

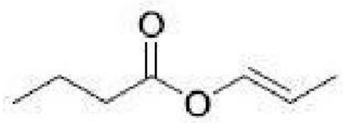


8024371277.



8024371278.

8024371279. 

8024371280. 

Question Number : 95 Question Id : 802437320 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

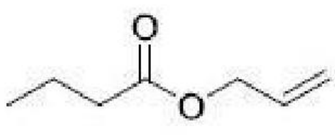
यौगिक जो निम्नलिखित आंकड़े दर्शाता है, वह है

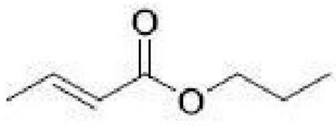
IR (υ_{max}): 1740 cm^{-1}

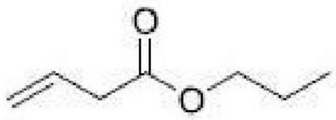
^{1}H NMR: δ 0.9 (t, 3H), 1.6 (sext, 2H), 2.3 (t, 2H), 4.6 (d, 2H), 5.2 (d, 1H), 5.4 (d, 1H), 5.9 (m, 1H) ppm

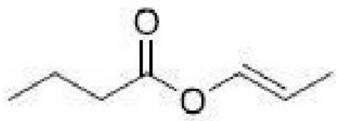
EI-MS (*m/z*): 71 (100%)

Options :

8024371277. 

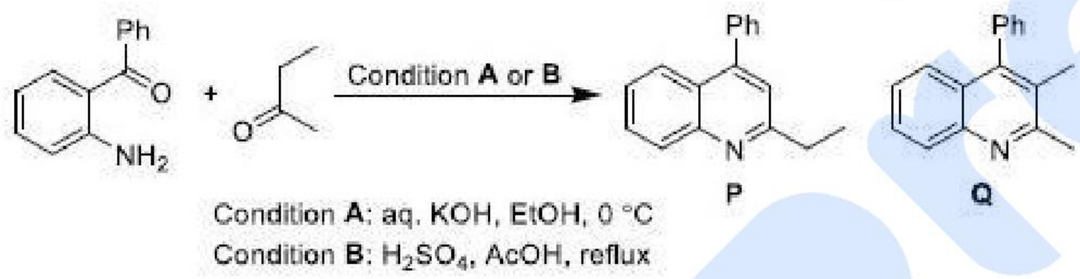
8024371278. 

8024371279. 

8024371280. 

Question Number : 96 Question Id : 802437321 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The correct statement for the following transformation is



Options :

P is preferentially formed *via* condition **A**, under thermodynamic control.

8024371281.

Q is preferentially formed *via* condition **B**, under thermodynamic control.

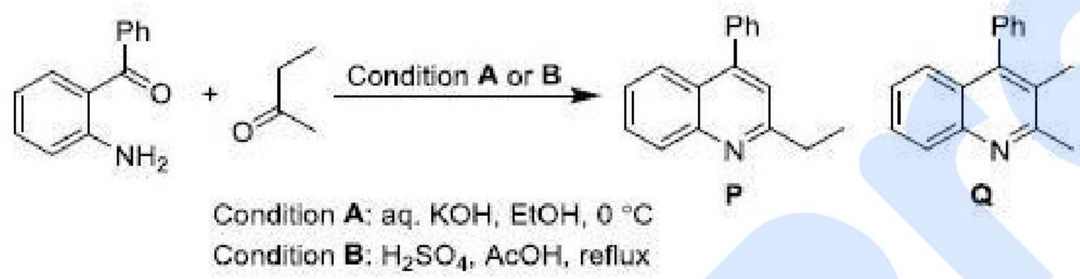
8024371282.

8024371283. **P** is preferentially formed *via* condition **B**, under kinetic control.

8024371284. **Q** is preferentially formed *via* condition **A**, under kinetic control.

Question Number : 96 Question Id : 802437321 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

निम्नलिखित रूपांतरण के लिए सही कथन है



Options :

8024371281. ऊष्मागतिकी कंट्रोल के अंतर्गत P का वरीय विरचन अभिक्रिया की दशा A के द्वारा होता है।

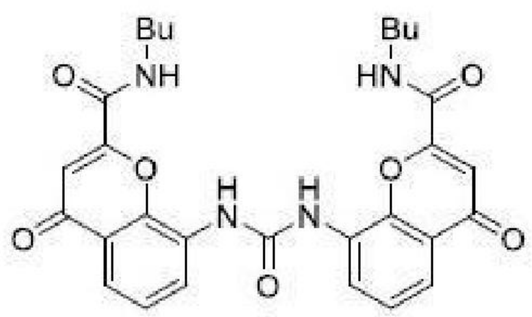
8024371282. ऊष्मागतिकी कंट्रोल के अंतर्गत Q का वरीय विरचन अभिक्रिया की दशा B के द्वारा होता है।

8024371283. रासायनिक गतिकी कंट्रोल के अंतर्गत P का वरीय विरचन अभिक्रिया की दशा B के द्वारा होता है।

8024371284. रासायनिक गतिकी कंट्रोल के अंतर्गत Q का वरीय विरचन अभिक्रिया की दशा A के द्वारा होता है।

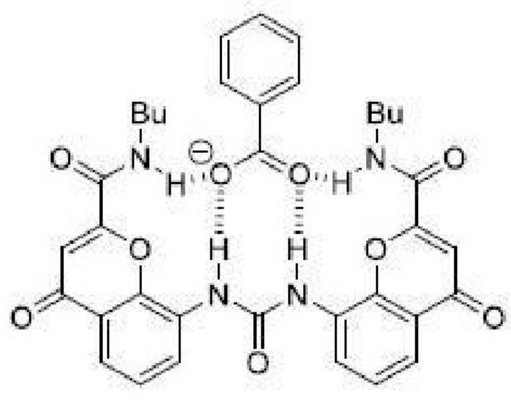
Question Number : 97 Question Id : 802437322 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The correct depiction of the strongest hydrogen bonded complex between benzoate anion and receptor **A** is

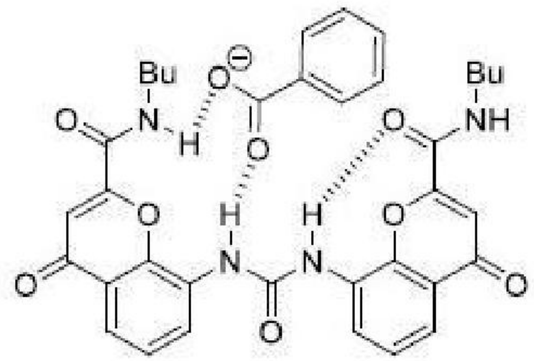


A

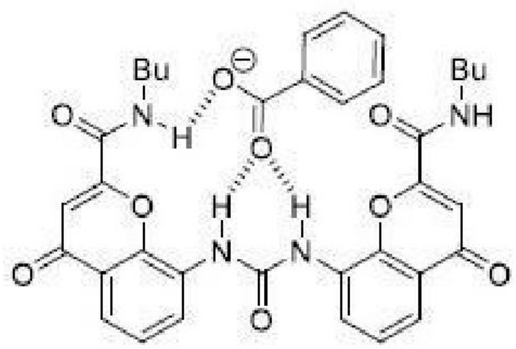
Options :



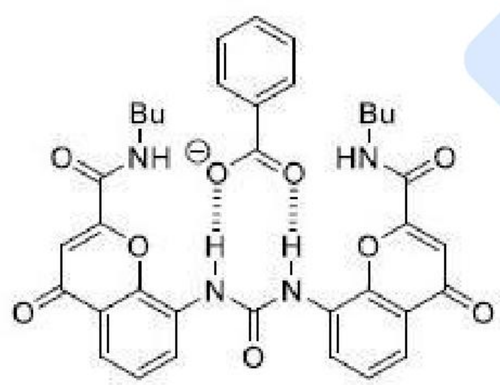
8024371285.



8024371286.



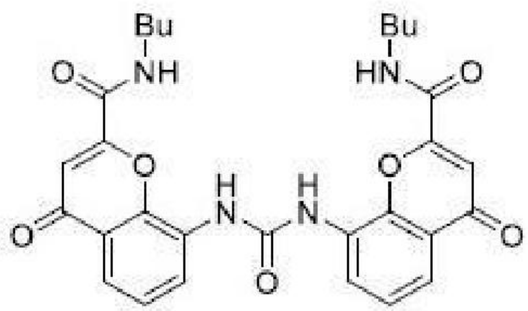
8024371287.



8024371288.

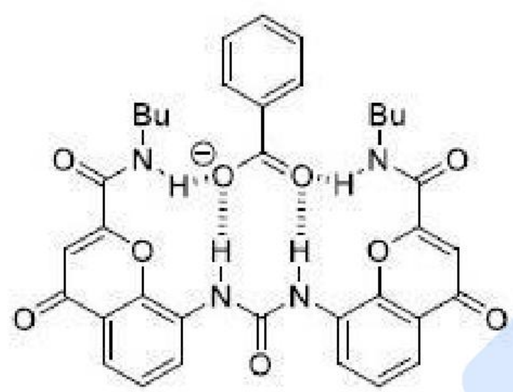
Question Number : 97 Question Id : 802437322 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

बेन्ज़ोएट ऋणायन तथा ग्राही A के मध्य सर्वाधिक प्रबल हाइड्रोजन आबंधित संकुल को जो सही रूप में दर्शाता है, वह है

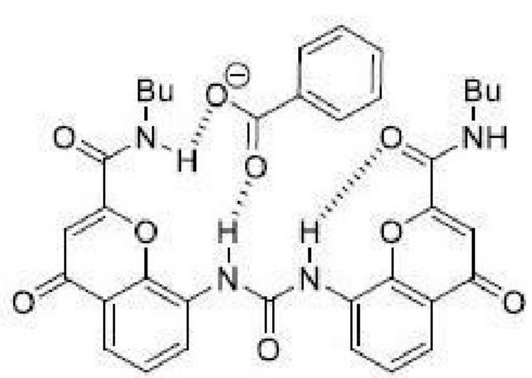


A

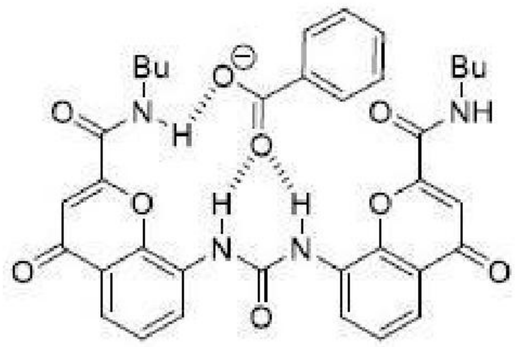
Options :



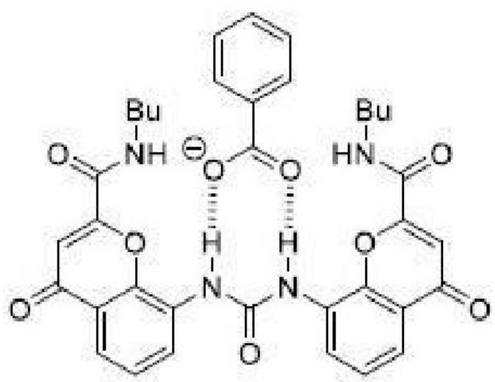
8024371285.



8024371286.



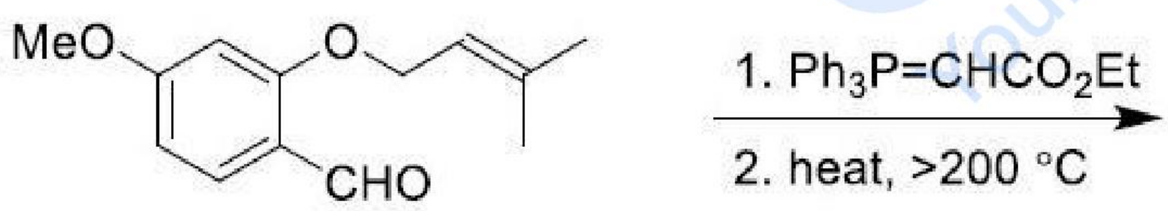
8024371287.



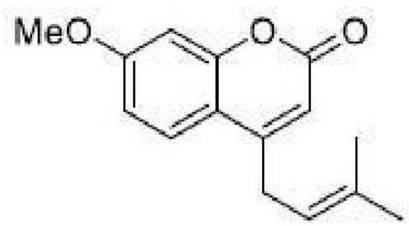
8024371288.

Question Number : 98 Question Id : 802437323 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

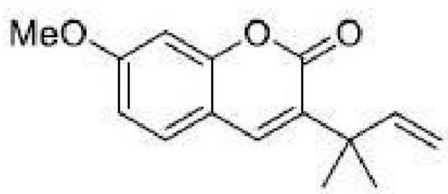
The major product formed in the following reaction sequence is



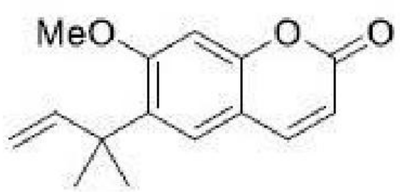
Options :



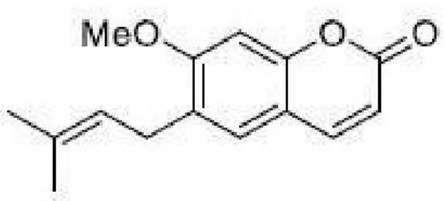
8024371289.



8024371290.



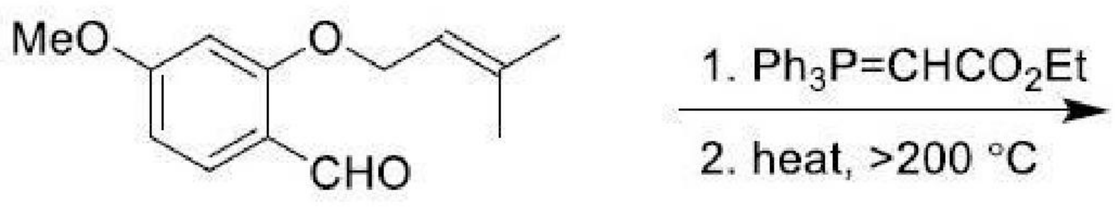
8024371291.



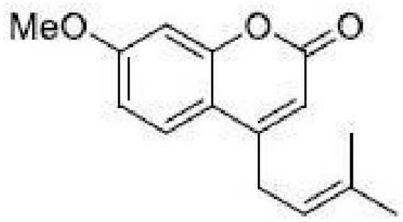
8024371292.

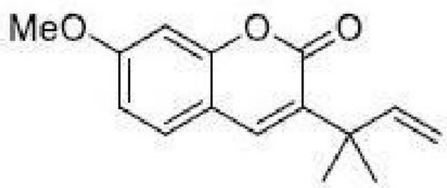
Question Number : 98 Question Id : 802437323 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

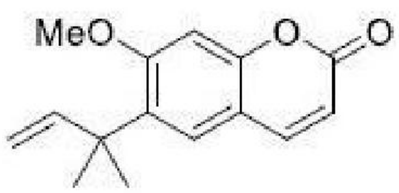
निम्नलिखित अभिक्रिया क्रम में विरचित मुख्य उत्पाद है

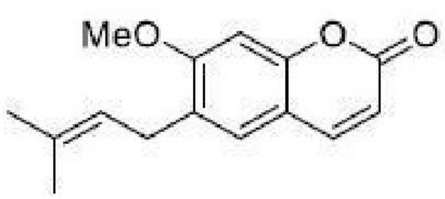


Options :

8024371289. 

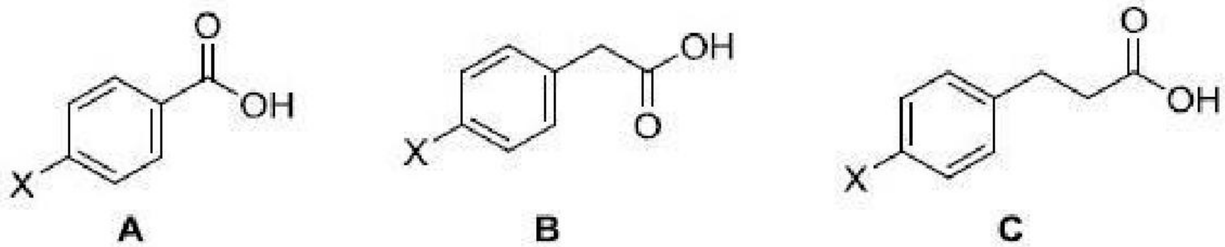
8024371290. 

8024371291. 

8024371292. 

Question Number : 99 Question Id : 802437324 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The correct order for the Hammett Reaction constant (ρ) for the deprotonation of the following Carboxylic acids is



Options :

8024371293. B > C > A

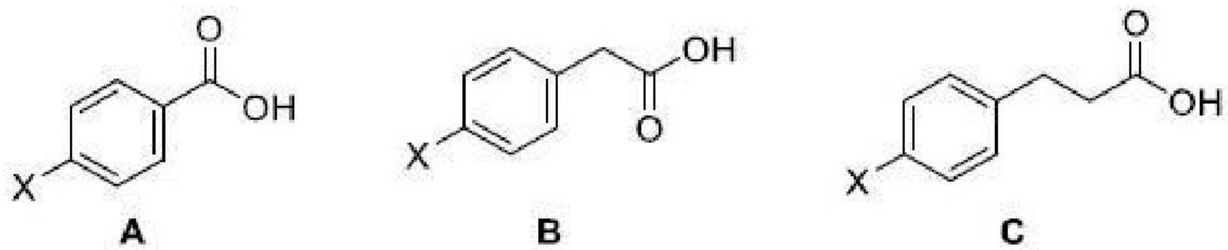
8024371294. C > A > B

8024371295. A > B > C

8024371296. A > C > B

Question Number : 99 Question Id : 802437324 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

निम्नलिखित कार्बोक्सिलिक अम्लों के विप्रोटॉनन के लिए हैमेट अभिक्रिया स्थिरांक (ρ) का सही क्रम है



Options :

8024371293. B > C > A

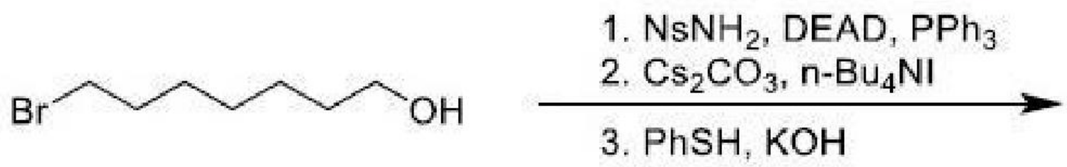
8024371294. C > A > B

8024371295. A > B > C

8024371296. A > C > B

Question Number : 100 Question Id : 802437325 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The major product formed in the following reaction sequence is



Ns = 2-Nitrobenzenesulfonyl

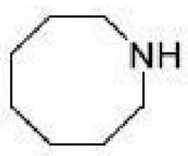
DEAD = Diethyl azodicarboxylate

Options :

8024371297.

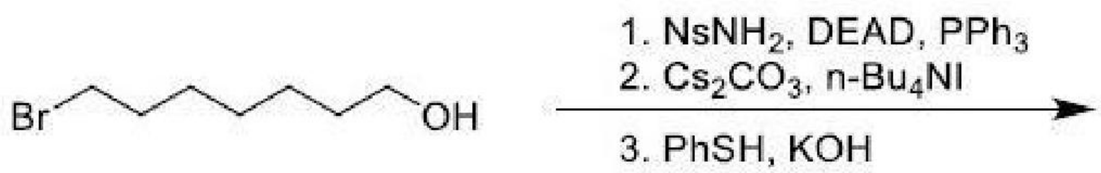
8024371298.

8024371299.

8024371300. 

Question Number : 100 Question Id : 802437325 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया क्रम में विरचित मुख्य उत्पाद है



Ns = 2-Nitrobenzenesulfonyl

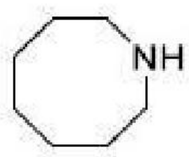
DEAD = Diethyl azodicarboxylate

Options :

8024371297.

8024371298.

8024371299.

8024371300. 

Sub-Section Number :	3
Sub-Section Id :	80243717
Question Shuffling Allowed :	Yes

Question Number : 101 Question Id : 802437326 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Let the Hamiltonian H, in one-dimension, be

$$H = \frac{p_x^2}{2m} + V(x).$$

The commutator of H with x, $[H, x]$, is

Options :

8024371301. $\frac{-i\hbar}{m} p_x$

8024371302. $\frac{-i\hbar}{2m} p_x^2$

8024371303. $\frac{i\hbar}{m} p_x$

8024371304. $\frac{i\hbar}{2m} p_x$

Question Number : 101 Question Id : 802437326 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

मान लीजिए एक विमा में हैमिल्टनी H

$$H = \frac{p_x^2}{2m} + V(x) \text{ है,}$$

H का x के साथ कम्यूटेटर $[H, x]$ है

Options :

8024371301. $\frac{-i\hbar}{m} p_x$

8024371302. $\frac{-i\hbar}{2m} p_x^2$

8024371303. $\frac{i\hbar}{m} p_x$

8024371304. $\frac{i\hbar}{2m} p_x$

Question Number : 102 Question Id : 802437327 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

For an electron in $1s$ orbital of He^+, the average value of $r, \langle r \rangle$ is

Options :

8024371305. $\frac{3}{2}a_0$

8024371306. $\frac{3}{4}a_0$

8024371307. $3a_0$

8024371308. $\frac{1}{2}a_0$

Question Number : 102 Question Id : 802437327 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

He^+ के $1s$ कक्षक में इलेक्ट्रॉन के r का औसत मान $\langle r \rangle$ है

Options :

8024371305. $\frac{3}{2}a_0$

8024371306. $\frac{3}{4}a_0$

8024371307. $3a_0$

8024371308. $\frac{1}{2}a_0$

Question Number : 103 Question Id : 802437328 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Consider a particle on a ring that is perturbed by interacting with an applied electric field (E) with the perturbation being

$H' = \mu E \cos\phi$, where μ is the dipole moment. The energy levels correct upto first order are

Options :

8024371309. $\frac{m_\ell^2\hbar^2}{2} - \frac{\mu E}{\pi}$

8024371310. $\frac{m_\ell^2\hbar^2}{2I} - \frac{\mu E}{2\pi}$

8024371311. $\frac{m_\ell^2\hbar^2}{2I} + \frac{\mu E}{2\pi}$

8024371312. $\frac{m_\ell^2\hbar^2}{2I}$

Question Number : 103 Question Id : 802437328 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

रिंग पर स्थित एक कण जो कि एक लगे हुए विद्युत क्षेत्र (E) से अन्योन्यक्रिया करने के कारण क्षोभित है, पर विचार कीजिए। यदि क्षोभ $H' = \mu E \cos\phi$ है, जहां पर μ द्विध्रुवी आघूर्ण है तो प्रथम कोटि तक सही ऊर्जा स्तर हैं

Options :

8024371309. $\frac{m_\ell^2 \hbar^2}{2} - \frac{\mu E}{\pi}$

8024371310. $\frac{m_\ell^2 \hbar^2}{2I} - \frac{\mu E}{2\pi}$

8024371311. $\frac{m_\ell^2 \hbar^2}{2I} + \frac{\mu E}{2\pi}$

8024371312. $\frac{m_\ell^2 \hbar^2}{2I}$

Question Number : 104 Question Id : 802437329 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

For a model system of three non-interacting electrons confined in a two dimensional square box of length L, the ground state energy in units of $\left(\frac{h^2}{8mL^2}\right)$ is

Options :

8024371313. 14

8024371314. 6

8024371315. 4

8024371316. 9

Question Number : 104 Question Id : 802437329 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

एक दूसरे से अप्रभावित तीन इलेक्टॉनों का एक आदर्श निकाय एक लंबाई L के द्विविमीय वर्गाकार बॉक्स में सीमित हैं। निम्नतम अवस्था की ऊर्जा, $\left(\frac{h^2}{8mL^2}\right)$ की इकाई में है

Options :

8024371313. 14

8024371314. 6

8024371315. 4

8024371316. 9

Question Number : 105 Question Id : 802437330 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The term symbol for the ground state of dinitrogen cation radical (N_2^+) is

Options :

8024371317. $^2\Pi_u$

8024371318. $^2\Sigma_u^-$

8024371319. $^2\Pi_g$

8024371320. $^2\Sigma_g^+$

Question Number : 105 Question Id : 802437330 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

डाइनाइट्रोज़न धनायन मूलक (N_2^+) की निम्नतम अवस्था के लिए पद प्रतीक है

Options :

8024371317. $^2\Pi_u$

8024371318. $^2\Sigma_u^-$

8024371319. $^2\Pi_g$

8024371320. $^2\Sigma_g^+$

Question Number : 106 Question Id : 802437331 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

D_{3h}	E	$2C_3$	$3C_2$	σ_h	$2S_3$	$3\sigma_v$		
A_1'	1	1	1	1	1	1		x^2+y^2, z^2
A_2'	1	1	–1	1	1	–1	R_z	
E'	2	–1	0	2	–1	0	(x, y)	x^2-y^2, xy
A_1''	1	1	1	–1	–1	–1		
A_2''	1	1	–1	–1	–1	1	z	
E''	2	–1	0	–2	1	0	(R_x, R_y)	(xz, yz)

The observed IR spectrum for BCl_3 exhibits three bands at 995, 480 and 244 cm^{-1}, while the Raman bands are observed at 995, 471 and 244 cm^{-1}. Given that for BCl_3, $\Gamma_{vib} = A_1' + 2E' + A_2''$, the frequency of A_1' mode in cm^{-1} is

Options :

8024371321. 244

8024371322. 471

8024371323. 480

8024371324. 995

Question Number : 106 Question Id : 802437331 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

D_{3h}	E	$2C_3$	$3C_2$	σ_h	$2S_3$	$3\sigma_v$		
A_1'	1	1	1	1	1	1		x^2+y^2, z^2
A_2'	1	1	–1	1	1	–1	R_z	
E'	2	–1	0	2	–1	0	(x, y)	x^2-y^2, xy
A_1''	1	1	1	–1	–1	–1		
A_2''	1	1	–1	–1	–1	1	z	
E''	2	–1	0	–2	1	0	(R_x, R_y)	(xz, yz)

BCl_3 का प्रेक्षित IR स्पेक्ट्रम तीन बैन्ड 995, 480 तथा 244 cm^{-1} पर दर्शाता है, जबकि रामन बैन्डस 995, 471 तथा 244 cm^{-1} पर प्रेक्षित होते हैं। BCl_3 के लिए दिया है $\Gamma_{vib} = A_1' + 2E' + A_2''$। A_1' मोड की cm^{-1} में आवृत्ति है

Options :

8024371321. 244

8024371322. 471

8024371323. 480

8024371324. 995

Question Number : 107 Question Id : 802437332 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Given the matrices for C_3 and σ_h below,

$$C_3 = \begin{bmatrix} -1/2 & -\sqrt{3}/2 & 0 \\ \sqrt{3}/2 & -1/2 & 0 \\ 0 & 0 & 1 \end{bmatrix} \qquad \sigma_h = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$$

the trace of the matrix representing for S_3^2 is

Options :

8024371325. 0

8024371326. -2

8024371327. 1

8024371328. -1

Question Number : 107 Question Id : 802437332 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

C_3 तथा σ_h के लिए मैट्रिक्स नीचे दी गयी है,

$$C_3 = \begin{bmatrix} -1/2 & -\sqrt{3}/2 & 0 \\ \sqrt{3}/2 & -1/2 & 0 \\ 0 & 0 & 1 \end{bmatrix} \qquad \sigma_h = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$$

S_3^2 का प्रतिनिधित्व करने वाली मैट्रिक्स की अनुरेख प्रति है

Options :

8024371325. 0

8024371326. -2

8024371327. 1

8024371328. -1

Question Number : 108 Question Id : 802437333 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The energy separation of $^{12}C^{16}O$ rotational energy levels between $J''= 3$ and $J'' = 9$ is $24\ cm^{-1}$. The rotational constant of $^{13}C^{16}O$ in cm^{-1} is closest to

Options :

8024371329. 2.98

8024371330. 0.88

8024371331. 1.90

8024371332. 2.08

Question Number : 108 Question Id : 802437333 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

$^{12}C^{16}O$ के $J''= 3$ तथा $J'' = 9$ घूर्णन ऊर्जा स्तरों के मध्य ऊर्जा प्रथकन $24\ cm^{-1}$ है। $^{13}C^{16}O$ के लिए घूर्णनी स्थिरांक cm^{-1} में जिसके निकटम है, वह है

Options :

8024371329. 2.98

8024371330. 0.88

8024371331. 1.90

8024371332. 2.08

Question Number : 109 Question Id : 802437334 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The vibrational transition energies of a diatomic molecule corresponding to $v = 1 \leftarrow v = 0$ and $v = 2 \leftarrow v = 1$ are $2143.1\ \mathrm{cm}^{-1}$ and $2116.1\ \mathrm{cm}^{-1}$, respectively. The anharmonic constant $(\omega_e x_e)$ of the molecule in cm^{-1} is

Options :

8024371333. 27

8024371334. 13.5

8024371335. 10

8024371336. 54

Question Number : 109 Question Id : 802437334 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

एक द्विपरमाणुकअणु के लिए $v = 1 \leftarrow v = 0$ तथा $v = 2 \leftarrow v = 1$ के अनुरूप कंपनिक संक्रमण ऊजायें हैं क्रमश: $2143.1\ \mathrm{cm}^{-1}$ तथा $2116.1\ \mathrm{cm}^{-1}$ । अणु का $(\omega_e x_e)\ \mathrm{cm}^{-1}$ में अप्रसंवादी स्थिरांक हैं

Options :

8024371333. 27

8024371334. 13.5

8024371335. 10

8024371336. 54

Question Number : 110 Question Id : 802437335 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The change in chemical potential (in J) of one mole of an ideal gas, when it is compressed isothermally at 300 K from 1.0 atm to 2.0 atm, is closest to ($\ln 2 = 0.69$)

Options :

8024371337. 1225

8024371338. 1725

8024371339. 2425

8024371340. 2725

Question Number : 110 Question Id : 802437335 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

आदर्श गैस के एक मोल का 300 K पर समतापी संपीडन 1.0 atm से 2.0 atm तक करते हैं तो रासायनिक विभव (J में) में परिवर्तन जिसके निकटतम है वह है $(\ln 2 = 0.69)$

Options :

8024371337. 1225

8024371338. 1725

8024371339. 2425

8024371340. 2725

Question Number : 111 Question Id : 802437336 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The excess molar entropy of mixing of liquid A with liquid B is $-R\ln 2$. The experimentally observed change in entropy upon mixing 1.0 mol of liquid A with 1.0 mol of liquid B is

Options :

8024371341. $-2R\ln 2$

8024371342. $+4R\ln 2$

8024371343. 0

8024371344. $+R\ln 2$

Question Number : 111 Question Id : 802437336 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

द्रव A को द्रव्य B से मिश्रित करने पर आधिक्य मोलर एंट्रापी $-R\ln 2$ है। द्रव A के 1.0 mol के द्रव B के 1.0 mol के साथ मिश्रित करने पर प्रायोगिक रूप से एंट्रापी में जो परिवर्तन प्रेक्षित होता है, वह है

Options :

8024371341. $-2R\ln 2$

8024371342. $+4R\ln 2$

8024371343. 0

8024371344. $+R\ln 2$

Question Number : 112 Question Id : 802437337 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The entropy in terms of internal energy $\{U - U(0)\}$, and canonical partition function (Q) is given by $S = \frac{U-U(0)}{T} + k \ln Q$. Assuming that the atoms are distinguishable, the corresponding expression for a monatomic perfect gas is
[Here n, m, N_A, k and h represent number of moles, mass of atom, Avogadro constant, Boltzmann constant and Planck constant, respectively. $U(0)$ is internal energy at $T = 0$].

Options :

$$S = \frac{5}{2} nR + n\,R \ln\left\{\frac{V(2\pi\, mkT)^{3/2}}{n\,N_A h^3}\right\}$$

8024371345.

$$S = \frac{3}{2} nR + n\,R \ln\left\{\frac{V(2\pi\, mkT)^{3/2}}{h^3}\right\}$$

8024371346.

$$S = \frac{5}{2} nR + n\,R \ln\left\{\frac{V(2\pi\, mkT)^{3/2}}{h^3}\right\}$$

8024371347.

$$S = \frac{3}{2} nR + n\,R \ln\left\{\frac{V(2\pi\, mkT)^{3/2}}{n\,N_A h^3}\right\}$$

8024371348.

Question Number : 112 Question Id : 802437337 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

आंतरिक ऊर्जा $\{U - U(0)\}$ तथा विहित विभाज्य फलन (Q) के पदों में एंट्रापी S को $S = \frac{U-U(0)}{T} + k \ln Q$ से दिया गया है। परमाणुओं को विभेध मानकर एक परमाणुक आदर्श गैस के लिए अनुरूप व्यंजक है।

[यहां पर n, m, N_A, k तथा $\hbar$ वर्णन करते हैं क्रमश: मोलों की संख्या, परमाणु की संहत, आवोगाद्रो नियतांक, बोल्ट्समान नियतांक तथा प्लांक नियतांक का । $U(0), T = 0$ पर आंतरिक ऊर्जा है].

Options :

8024371345. $$S = \frac{5}{2} nR + n\,R \ln\left\{\frac{V(2\pi\, mkT)^{3/2}}{n\,N_A h^3}\right\}$$

8024371346. $$S = \frac{3}{2} nR + n\,R \ln\left\{\frac{V(2\pi\, mkT)^{3/2}}{h^3}\right\}$$

8024371347. $$S = \frac{5}{2} nR + n\,R \ln\left\{\frac{V(2\pi\, mkT)^{3/2}}{h^3}\right\}$$

8024371348. $$S = \frac{3}{2} nR + n\,R \ln\left\{\frac{V(2\pi\, mkT)^{3/2}}{n\,N_A h^3}\right\}$$

Question Number : 113 Question Id : 802437338 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

For a van der Waals gas, the partial derivative $\left(\frac{\partial U}{\partial V}\right)_T$ is

Options :

8024371349. $\frac{V_m}{a}$

8024371350. $\frac{V_m^2}{a}$

8024371351. $\frac{a}{V_m^2}$

8024371352. $\frac{a}{V_m}$

Question Number : 113 Question Id : 802437338 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

वान्डर वाल्स गैस के लिए आंशिक व्युत्पन्न $\left(\frac{\partial U}{\partial V}\right)_T$ है

Options :

8024371349. $\frac{V_m}{a}$

8024371350. $\frac{V_m^2}{a}$

8024371351. $\frac{a}{V_m^2}$

8024371352. $\frac{a}{V_m}$

Question Number : 114 Question Id : 802437339 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

An aqueous solution contains 0.02 mol kg^{-1} NaCl and 0.03 mol kg^{-1} $Ca(NO_3)_2$. The logarithm of the mean ionic activity coefficient $(\log \gamma_{\pm})$ of this solution at 25 °C is

Options :

8024371353. $-\sqrt{0.095}$

8024371354. $\sqrt{0.154}$

8024371355. $-\sqrt{0.033}$

8024371356. $-\sqrt{0.11}$

Question Number : 114 Question Id : 802437339 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

एक जलीय विलयन में समाविष्ट हैं 0.02 mol kg^{-1} NaCl तथा 0.03 mol kg^{-1} $Ca(NO_3)_2$ । 25 °C पर इस विलयन का माध्य आयनिक सक्रियता गुणांक का लघुगणकीय $(\log \gamma_{\pm})$ है

Options :

8024371353. $-\sqrt{0.095}$

8024371354. $\sqrt{0.154}$

8024371355. $-\sqrt{0.033}$

8024371356. $-\sqrt{0.11}$

Question Number : 115 Question Id : 802437340 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Molar conductivities of an electrolyte are 100 and 50 mS cm^2 mol^{-1} when concentrations are 4 and 9 mM, respectively. The limiting molar conductivity of this electrolyte in mS cm^2 mol^{-1} is closest to

Options :

8024371357. 150

8024371358. 200

8024371359. 250

8024371360. 300

Question Number : 115 Question Id : 802437340 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

4 तथा 9 mM सांद्रता के एक विद्युत-अपघटय की मोलर चालकतायें क्रमश: 100 तथा 50 mS cm^2 mol^{-1} हैं। इस विद्युत- अपघटय की चरम मोलर चालकता mS cm^2 mol^{-1} में जिसके निकटतम है,वह है

Options :

8024371357. 150

8024371358. 200

8024371359. 250

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8024371360. 300

Question Number : 116 Question Id : 802437341 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The concentration (C) of a compound undergoing decomposition as a function of time (t) is given below:

t/min	0	1	2	4	6
C/M	1.00	0.80	0.67	0.50	0.40

The order of the reaction is

Options :

8024371361. 0

8024371362. 1

8024371363. 2

8024371364. 3

Question Number : 116 Question Id : 802437341 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

एक अपघटित हो रहे यौगिक की सांद्रता (C) का समय (t) से संबंध नीचे दिए गया है:

t/min	0	1	2	4	6
C/M	1.00	0.80	0.67	0.50	0.40

अभिक्रिया की कोटि है

Options :

8024371361. 0

8024371362. 1

8024371363. 2

8024371364. 3

Question Number : 117 Question Id : 802437342 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Substance 'A' is exposed to 600 nm, 100 W light source for 6626 s, with 50% of the incident light being absorbed. 'A' decomposes according to the reaction $A \rightarrow 2B$. As a result of irradiation, 0.2 mol of B is produced. The quantum yield of the reaction is closest to

Options :

8024371365. 6×10^{6}

8024371366. 6×10^{-4}

8024371367. 6×10^{-2}

8024371368. 6

Question Number : 117 Question Id : 802437342 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

600 nm पर 100 W के प्रकाश स्त्रोत से पदार्थ 'A' को 6626 s तक अनावरित करने पर, आपतित प्रकाश का 50% अवशोषित हो जाता है। 'A' का अपघटन अभिक्रिया $A \rightarrow 2B$ के अनुसार होता है। परिणाम स्वरूप B के 0.2 mol उत्पन्न होते हैं। अभिक्रिया की क्वांटम लब्धि जिसके निकटतम है, वह है

Options :

8024371365. 6×10^{6}

8024371366. 6×10^{-4}

8024371367. 6×10^{-2}

8024371368. 6

Question Number : 118 Question Id : 802437343 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

A gas is known to satisfy Langmuir isotherm when adsorbed on a certain metal surface. If the fractional coverage of the gas is 0.5 when the gas pressure is *1.0* Pa, the fractional coverage at *3.0* Pa would be closest to

Options :

8024371369. 0.67

8024371370. 0.75

8024371371. 0.80

8024371372. 1.0

Question Number : 118 Question Id : 802437343 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

एक गैस किसी एक धातु सतह पर जब अधिशोषित होती है तो लैंगम्यूर समतापी को संतुष्ट करती है। यदि गैस के दाब *1.0* Pa पर गैस द्वारा आंशिक व्याप्ति 0.5 है, तो *3.0* Pa पर आंशिक व्याप्ति जिसके निकटतम होगी, वह है

Options :

8024371369. 0.67

8024371370. 0.75

8024371371. 0.80

8024371372. 1.0

Question Number : 119 Question Id : 802437344 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Iron belongs to the BCC lattice. The Miller indices of the second allowed reflection in the powder diffraction pattern of iron would be

Options :

8024371373. (100)

8024371374. (111)

8024371375. (200)

8024371376. (210)

Question Number : 119 Question Id : 802437344 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

आयरन BCC जालक के अंतर्गत आता है। आयरन के पाउडर विवर्तन पैटर्न में द्वितीय अनुमत परावर्तन के मिलर सूचकांक होंगें

Options :

8024371373. (100)

8024371374. (111)

8024371375. (200)

8024371376. (210)

Question Number : 120 Question Id : 802437345 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The degree of polymerization at $t = 10\,\mathrm{h}$ of a polymer formed by a stepwise process with polymerization rate constant of $3 \times 10^{-2}\,\mathrm{M}^{-1}\mathrm{s}^{-1}$ and an initial monomer concentration of $50\,\mathrm{mM}$ is

Options :

8024371377. 55

8024371378. 65

8024371379. 550

8024371380. 505

Question Number : 120 Question Id : 802437345 Question Type : MCQ Option Shuffling : No Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

एक बहुलक चरणबद्ध विधि से विरचित होता है, जिसका बहुलीकरण दर नियतांक $3 \times 10^{-2}\,\mathrm{M}^{-1}\mathrm{s}^{-1}$ है। प्रारंभिक एकलक की सांद्रता $50\,\mathrm{mM}$ के लिए $t = 10\,\mathrm{h}$ पर इसका बहुलीकरण अंश है

Options :

8024371377. 55

8024371378. 65

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8024371379. 550

8024371380. 505

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