

# National Testing Agency

<b>Question Paper Name :</b>	SET 108
<b>Subject Name :</b>	B TECH
<b>Creation Date :</b>	2023-04-06 18:36:16
<b>Duration :</b>	180
<b>Total Marks :</b>	300
<b>Display Marks:</b>	Yes

## **B E and B Tech**

<b>Group Number :</b>	1
<b>Group Id :</b>	71550541
<b>Group Maximum Duration :</b>	0
<b>Group Minimum Duration :</b>	180
<b>Show Attended Group? :</b>	No
<b>Edit Attended Group? :</b>	No
<b>Break time :</b>	0
<b>Group Marks :</b>	300
<b>Is this Group for Examiner? :</b>	No
<b>Examiner permission :</b>	Cant View
<b>Show Progress Bar? :</b>	No

## **Mathematics Section A**

<b>Section Id :</b>	715505223
<b>Section Number :</b>	1

<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	20
<b>Number of Questions to be attempted :</b>	20
<b>Section Marks :</b>	80
<b>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes
<b>Maximum Instruction Time :</b>	0
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	715505223
<b>Question Shuffling Allowed :</b>	Yes
<b>Is Section Default? :</b>	null

**Question Number : 1 Question Id : 7155053682 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Let  $A = \{x \in \mathbb{R} : [x + 3] + [x + 4] \leq 3\}$ ,

$B = \left\{ x \in \mathbb{R} : 3^x \left( \sum_{r=1}^{\infty} \frac{3}{10^r} \right)^{x-3} < 3^{-3x} \right\}$ , where  $[t]$  denotes greatest integer

function. Then,

**Options :**

71550511721.  $A = B$

71550511722.  $A \subset B, A \neq B$

71550511723.  $B \subset C, A \neq B$

71550511724.  $A \cap B = \phi$

Question Number : 1 Question Id : 7155053682 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना  $A = \{x \in \mathbb{R} : [x + 3] + [x + 4] \leq 3\}$ ,

$$B = \left\{ x \in \mathbb{R} : 3^x \left( \sum_{r=1}^{\infty} \frac{3}{10^r} \right)^{x-3} < 3^{-3x} \right\}$$

हैं, जहाँ  $[t]$  महत्तम पूर्णांक फलन है। तब

Options :

71550511721.  $A=B$

71550511722.  $A \subset B, A \neq B$

71550511723.  $B \subset C, A \neq B$

71550511724.  $A \cap B = \phi$

Question Number : 2 Question Id : 7155053683 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The sum of all the roots of the equation  $|x^2 - 8x + 15| - 2x + 7 = 0$  is:

Options :

71550511725.  $9 - \sqrt{3}$

71550511726.  $9 + \sqrt{3}$

71550511727.  $11 + \sqrt{3}$

71550511728.  $11 - \sqrt{3}$

**Question Number : 2 Question Id : 7155053683 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

समीकरण  $|x^2 - 8x + 15| - 2x + 7 = 0$  के सभी मूलों का योग है:

**Options :**

71550511725.  $9 - \sqrt{3}$

71550511726.  $9 + \sqrt{3}$

71550511727.  $11 + \sqrt{3}$

71550511728.  $11 - \sqrt{3}$

**Question Number : 3 Question Id : 7155053684 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Let  $A = [a_{ij}]_{2 \times 2}$ , where  $a_{ij} \neq 0$  for all  $i, j$  and  $A^2 = I$ . Let  $a$  be the sum of all diagonal elements of  $A$  and  $b = |A|$ . Then  $3a^2 + 4b^2$  is equal to

**Options :**

71550511729. 3

71550511730. 4

71550511731. 7

71550511732. 14

**Question Number : 3 Question Id : 7155053684 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

माना  $A = [a_{ij}]_{2 \times 2}$ , जहाँ सभी  $i, j$  के लिए  $a_{ij} \neq 0$  एवं  $A^2 = I$  हैं। माना  $A$  के विकर्ण के सभी अवयवों का योग  $a$  है और  $b = |A|$  है। तब  $3a^2 + 4b^2$  बराबर है:

**Options :**

71550511729. 3

71550511730. 4

71550511731. 7

71550511732. 14

**Question Number : 4 Question Id : 7155053685 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

If the system of equations

$$x + y + az = b$$

$$2x + 5y + 2z = 6$$

$$x + 2y + 3z = 3$$

has infinitely many solutions, then  $2a + 3b$  is equal to

**Options :**

71550511733. 20

71550511734. 23

71550511735. 25

71550511736. 28

**Question Number : 4 Question Id : 7155053685 Question Type : MCQ Option Shuffling : Yes Is  
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum  
Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

यदि समीकरण निकाय

$$x + y + az = b$$

$$2x + 5y + 2z = 6$$

$$x + 2y + 3z = 3$$

के अनंत हल हैं। तब  $2a + 3b$  बराबर है :

**Options :**

71550511733. 20

71550511734. 23

71550511735. 25

71550511736. 28

**Question Number : 5 Question Id : 7155053686 Question Type : MCQ Option Shuffling : Yes Is  
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum  
Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

If  ${}^{2n}C_3 : {}^nC_3 = 10 : 1$ , then the ratio  $(n^2 + 3n) : (n^2 - 3n + 4)$  is

**Options :**

71550511737. 27:11

71550511738. 35:16

71550511739. 2:1

71550511740. 65:37

**Question Number : 5 Question Id : 7155053686 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

यदि  ${}^{2n}C_3 : {}^nC_3 = 10 : 1$  है, तब अनुपात  $(n^2 + 3n) : (n^2 - 3n + 4)$  है:

**Options :**

71550511737. 27:11

71550511738. 35:16

71550511739. 2:1

71550511740. 65:37

**Question Number : 6 Question Id : 7155053687 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

If the ratio of the fifth term from the beginning to the fifth term from the end in the expansion of  $\left(\sqrt[4]{2} + \frac{1}{\sqrt[4]{3}}\right)^n$  is  $\sqrt{6} : 1$ , then the third term from the beginning is:

**Options :**

71550511741.  $60\sqrt{2}$

71550511742.  $60\sqrt{3}$

71550511743.  $30\sqrt{2}$

71550511744.  $30\sqrt{3}$

**Question Number : 6 Question Id : 7155053687 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

यदि  $\left(\sqrt[4]{2} + \frac{1}{\sqrt[4]{3}}\right)^n$  के विस्तार में आरंभ से पाँचवे पद का अंत से पाँचवे पद से अनुपात  $\sqrt{6} : 1$  है, तब आरंभ से तीसरा पद है:

**Options :**

71550511741.  $60\sqrt{2}$

71550511742.  $60\sqrt{3}$

71550511743.  $30\sqrt{2}$

71550511744.  $30\sqrt{3}$

**Question Number : 7 Question Id : 7155053688 Question Type : MCQ Option Shuffling : Yes Is**



**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The sum of the first 20 terms of the series  $5 + 11 + 19 + 29 + 41 + \dots$  is

**Options :**

71550511745. 3250

71550511746. 3450

71550511747. 3420

71550511748. 3520

**Question Number : 7 Question Id : 7155053688 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

श्रेणी  $5 + 11 + 19 + 29 + 41 + \dots$  के प्रथम 20 पदों का योग है:

**Options :**

71550511745. 3250

71550511746. 3450

71550511747. 3420

71550511748. 3520

**Question Number : 8 Question Id : 7155053689 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Let  $a_1, a_2, a_3, \dots, a_n$  be  $n$  positive consecutive terms of an arithmetic progression.

If  $d > 0$  is its common difference, then

$$\lim_{n \rightarrow \infty} \sqrt{\frac{d}{n}} \left( \frac{1}{\sqrt{a_1} + \sqrt{a_2}} + \frac{1}{\sqrt{a_2} + \sqrt{a_3}} + \dots + \frac{1}{\sqrt{a_{n-1}} + \sqrt{a_n}} \right) \text{ is}$$

**Options :**

71550511749. 1

71550511750. 0

71550511751.  $\sqrt{d}$

71550511752.  $\frac{1}{\sqrt{d}}$

**Question Number : 8 Question Id : 7155053689 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

माना  $a_1, a_2, a_3, \dots, a_n$  समांतर श्रेणी के धनात्मक क्रमागत  $n$  पद हैं। यदि सर्वान्तर  $d > 0$  है,

तब  $\lim_{n \rightarrow \infty} \sqrt{\frac{d}{n}} \left( \frac{1}{\sqrt{a_1} + \sqrt{a_2}} + \frac{1}{\sqrt{a_2} + \sqrt{a_3}} + \dots + \frac{1}{\sqrt{a_{n-1}} + \sqrt{a_n}} \right)$  का मान है:

**Options :**

71550511749. 1

71550511750. 0

71550511751.  $\sqrt{d}$

71550511752.  $\frac{1}{\sqrt{d}}$

Question Number : 9 Question Id : 7155053690 Question Type : MCQ Option Shuffling : Yes Is  
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum  
Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If  $2x^y + 3y^x = 20$ , then  $\frac{dy}{dx}$  at  $(2, 2)$  is equal to:

Options :

71550511753.  $-\left(\frac{3 + \log_e 4}{2 + \log_e 8}\right)$

71550511754.  $-\left(\frac{3 + \log_e 16}{4 + \log_e 8}\right)$

71550511755.  $-\left(\frac{3 + \log_e 8}{2 + \log_e 4}\right)$

71550511756.  $-\left(\frac{2 + \log_e 8}{3 + \log_e 4}\right)$

Question Number : 9 Question Id : 7155053690 Question Type : MCQ Option Shuffling : Yes Is  
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum  
Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि  $2x^y + 3y^x = 20$  है, तब  $(2, 2)$  पर  $\frac{dy}{dx}$  का मान है:

Options :

71550511753.  $-\left(\frac{3 + \log_e 4}{2 + \log_e 8}\right)$

71550511754.  $-\left(\frac{3+\log_e 16}{4+\log_e 8}\right)$

71550511755.  $-\left(\frac{3+\log_e 8}{2+\log_e 4}\right)$

71550511756.  $-\left(\frac{2+\log_e 8}{3+\log_e 4}\right)$

**Question Number : 10 Question Id : 7155053691 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Let  $5f(x) + 4f\left(\frac{1}{x}\right) = \frac{1}{x} + 3, x > 0$ . Then  $18 \int_1^2 f(x) dx$  is equal to:

**Options :**

71550511757.  $5 \log_e 2 - 3$

71550511758.  $5 \log_e 2 + 3$

71550511759.  $10 \log_e 2 - 6$

71550511760.  $10 \log_e 2 + 6$

**Question Number : 10 Question Id : 7155053691 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

माना  $5f(x) + 4f\left(\frac{1}{x}\right) = \frac{1}{x} + 3, x > 0$  है। तब  $18 \int_1^2 f(x) dx$  का मान है:

**Options :**

71550511757.  $5 \log_e 2 - 3$

71550511758.  $5 \log_e 2 + 3$

71550511759.  $10 \log_e 2 - 6$

71550511760.  $10 \log_e 2 + 6$

**Question Number : 11 Question Id : 7155053692 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Let  $I(x) = \int \frac{x^2(x \sec^2 x + \tan x)}{(x \tan x + 1)^2} dx$ . If  $I(0) = 0$ , then  $I\left(\frac{\pi}{4}\right)$  is equal to

**Options :**

71550511761.  $\log_e \frac{(\pi+4)^2}{32} - \frac{\pi^2}{4(\pi+4)}$

71550511762.  $\log_e \frac{(\pi+4)^2}{16} + \frac{\pi^2}{4(\pi+4)}$

71550511763.  $\log_e \frac{(\pi+4)^2}{16} - \frac{\pi^2}{4(\pi+4)}$

71550511764.  $\log_e \frac{(\pi+4)^2}{32} + \frac{\pi^2}{4(\pi+4)}$

Question Number : 11 Question Id : 7155053692 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना  $I(x) = \int \frac{x^2(x \sec^2 x + \tan x)}{(x \tan x + 1)^2} dx$  है। यदि,  $I(0) = 0$  है, तब  $I(\frac{\pi}{4})$  का मान है:

Options :

71550511761.  $\log_e \frac{(\pi+4)^2}{32} - \frac{\pi^2}{4(\pi+4)}$

71550511762.  $\log_e \frac{(\pi+4)^2}{16} + \frac{\pi^2}{4(\pi+4)}$

71550511763.  $\log_e \frac{(\pi+4)^2}{16} - \frac{\pi^2}{4(\pi+4)}$

71550511764.  $\log_e \frac{(\pi+4)^2}{32} + \frac{\pi^2}{4(\pi+4)}$

Question Number : 12 Question Id : 7155053693 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The straight lines  $l_1$  and  $l_2$  pass through the origin and trisect the line segment of the line  $L: 9x + 5y = 45$  between the axes. If  $m_1$  and  $m_2$  are the slopes of the lines  $l_1$  and  $l_2$ , then the point of intersection of the line  $y = (m_1 + m_2)x$  with  $L$  lies on

Options :

71550511765.  $y - 2x = 5$

71550511766.  $6x - y = 15$

71550511767.  $y - x = 5$

71550511768.  $6x + y = 10$

**Question Number : 12 Question Id : 7155053693 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

सरल रेखाएँ  $l_1$  व  $l_2$  मूल बिन्दु से होकर जाती हैं और रेखा  $L: 9x + 5y = 45$  के अक्षों के बीच रेखाखंड को तीन बराबर भागों में बाँटती हैं। यदि रेखाओं  $l_1$  व  $l_2$  की प्रवणताएँ  $m_1$  व  $m_2$  हैं, तब रेखाओं  $y = (m_1 + m_2)x$  और  $L$  का प्रतिच्छेदन बिन्दु किस रेखा पर है?

**Options :**

71550511765.  $y - 2x = 5$

71550511766.  $6x - y = 15$

71550511767.  $y - x = 5$

71550511768.  $6x + y = 10$

**Question Number : 13 Question Id : 7155053694 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

If the equation of the plane passing through the line of intersection of the planes  $2x - y + z = 3$ ,  $4x - 3y + 5z + 9 = 0$  and parallel to the line

$\frac{x+1}{-2} = \frac{y+3}{4} = \frac{z-2}{5}$  is  $ax + by + cz + 6 = 0$ , then  $a + b + c$  is equal to

**Options :**

71550511769. 12

71550511770. 13

71550511771. 14

71550511772. 15

**Question Number : 13 Question Id : 7155053694 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

यदि समतलों  $2x - y + z = 3$ ,  $4x - 3y + 5z + 9 = 0$  की प्रतिच्छेदन रेखा से होकर जाने वाले

तथा रेखा  $\frac{x+1}{-2} = \frac{y+3}{4} = \frac{z-2}{5}$  के समांतर समतल का समीकरण  $ax + by + cz + 6 = 0$  है,

तब  $a + b + c$  बराबर है:

**Options :**

71550511769. 12

71550511770. 13

71550511771. 14

71550511772. 15

**Question Number : 14 Question Id : 7155053695 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**



One vertex of a rectangular parallelepiped is at the origin O and the lengths of its edges along  $x$ ,  $y$  and  $z$  axes are 3, 4 and 5 units respectively. Let P be the vertex (3,4,5). Then the shortest distance between the diagonal OP and an edge parallel to  $z$  axis, not passing through O or P is:

**Options :**

71550511773.  $\frac{12}{5}$

71550511774.  $\frac{12}{5\sqrt{5}}$

71550511775.  $12\sqrt{5}$

71550511776.  $\sqrt{5}$

**Question Number : 14 Question Id : 7155053695 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

एक आयताकार समांतर षट्फलक का एक शीर्ष मूल बिंदु O पर है और  $x$ ,  $y$  तथा  $z$  अक्षों के अनुदिश इसके किनारों (edges) की लम्बाइयाँ क्रमशः 3, 4 तथा 5 इकाई हैं। माना इसका शीर्ष P, बिंदु (3,4,5) पर है। तब विकर्ण OP तथा  $z$  अक्ष के समांतर इसके एक किनारे, जो O या P से होकर नहीं जाता है, के बीच न्यूनतम दूरी है:

**Options :**

71550511773.  $\frac{12}{5}$

71550511774.  $\frac{12}{5\sqrt{5}}$

71550511775.  $12\sqrt{5}$

$$71550511776. \frac{12}{\sqrt{5}}$$

**Question Number : 15 Question Id : 7155053696 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Let the position vectors of the points A, B, C and D be

$5\hat{i} + 5\hat{j} + 2\lambda\hat{k}$ ,  $\hat{i} + 2\hat{j} + 3\hat{k}$ ,  $-2\hat{i} + \lambda\hat{j} + 4\hat{k}$  and  $-\hat{i} + 5\hat{j} + 6\hat{k}$ . Let the set  $S = \{\lambda \in \mathbb{R} : \text{the points A, B, C and D are coplanar}\}$ . Then  $\sum_{\lambda \in S} (\lambda + 2)^2$  is equal to

**Options :**

71550511777. 13

71550511778. 25

71550511779. 41

71550511780.  $\frac{37}{2}$

**Question Number : 15 Question Id : 7155053696 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

माना बिन्दुओं A, B, C व D के स्थिति सदिश  $5\hat{i} + 5\hat{j} + 2\lambda\hat{k}$ ,  $\hat{i} + 2\hat{j} + 3\hat{k}$ ,  $-2\hat{i} + \lambda\hat{j} + 4\hat{k}$  व  $-\hat{i} + 5\hat{j} + 6\hat{k}$  हैं। माना समुच्चय  $S = \{\lambda \in \mathbb{R} : \text{बिन्दु A, B, C व D सहतलीय हैं}\}$  है, तब

$\sum_{\lambda \in S} (\lambda + 2)^2$  बराबर है:

**Options :**

71550511777. 13

71550511778. 25

71550511779. 41

71550511780.  $\frac{37}{2}$

**Question Number : 16 Question Id : 7155053697 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Let  $\vec{a} = 2\hat{i} + 3\hat{j} + 4\hat{k}$ ,  $\vec{b} = \hat{i} - 2\hat{j} - 2\hat{k}$  and  $\vec{c} = -\hat{i} + 4\hat{j} + 3\hat{k}$ .

If  $\vec{d}$  is a vector perpendicular to both  $\vec{b}$  and  $\vec{c}$ , and  $\vec{a} \cdot \vec{d} = 18$ , then  $|\vec{a} \times \vec{d}|^2$  is equal to

**Options :**

71550511781. 640

71550511782. 680

71550511783. 720

71550511784. 760

**Question Number : 16 Question Id : 7155053697 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

माना  $\vec{a} = 2\hat{i} + 3\hat{j} + 4\hat{k}$ ,  $\vec{b} = \hat{i} - 2\hat{j} - 2\hat{k}$  व  $\vec{c} = -\hat{i} + 4\hat{j} + 3\hat{k}$  हैं यदि एक सदिश  $\vec{d}$  सदिशों  $\vec{b}$  व  $\vec{c}$ , दोनों के लम्बवत है और  $\vec{a} \cdot \vec{d} = 18$  है, तब  $|\vec{a} \times \vec{d}|^2$  का मान है:

**Options :**

71550511781. 640

71550511782. 680

71550511783. 720

71550511784. 760

**Question Number : 17 Question Id : 7155053698 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The mean and variance of a set of 15 numbers are 12 and 14 respectively. The mean and variance of another set of 15 numbers are 14 and  $\sigma^2$  respectively. If the variance of all the 30 numbers in the two sets is 13, then  $\sigma^2$  is equal to

**Options :**

71550511785. 12

71550511786. 11

71550511787. 10

71550511788. 9

**Question Number : 17 Question Id : 7155053698 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

15 संख्याओं के माध्य व प्रसरण क्रमशः 12 व 14 हैं। 15 और संख्याओं के माध्य व प्रसरण क्रमशः 14 व  $\sigma^2$  हैं। यदि सभी 30 संख्याओं का प्रसरण 13 है, तो  $\sigma^2$  बराबर है:

**Options :**

71550511785. 12

71550511786. 11

71550511787. 10

71550511788. 9

**Question Number : 18 Question Id : 7155053699 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A pair of dice is thrown 5 times. For each throw, a total of 5 is considered a success. If the probability of at least 4 successes is  $\frac{k}{3^{11}}$ , then  $k$  is equal to

**Options :**

71550511789. 75

71550511790. 82

71550511791. 123

71550511792. 164

**Question Number : 18 Question Id : 7155053699 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

दो पासों को 5 बार फेंका जाता है तथा हर बार प्राप्त संख्याओं का योग 5 होना एक सफलता मानी जाती है। यदि कम से कम 4 सफलताओं की प्रायिकता  $\frac{k}{3^{11}}$  है, तब  $k$  बराबर है:

**Options :**

71550511789. 75

71550511790. 82

71550511791. 123

71550511792. 164

**Question Number : 19 Question Id : 7155053700 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

From the top A of a vertical wall AB of height 30 m, the angles of depression of the top P and bottom Q of a vertical tower PQ are  $15^\circ$  and  $60^\circ$  respectively, B and Q are on the same horizontal level. If C is a point on AB such that  $CB = PQ$ , then the area (in  $m^2$ ) of the quadrilateral BCPQ is equal to

**Options :**

71550511793.  $200(3 - \sqrt{3})$

71550511794.  $600(\sqrt{3} - 1)$

71550511795.  $300(\sqrt{3} - 1)$

71550511796.  $300(\sqrt{3} + 1)$

**Question Number : 19 Question Id : 7155053700 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

30 मीटर ऊँची ऊर्ध्वाधर दीवार AB के शिखर A से एक ऊर्ध्वाधर टॉवर PQ के शिखर P व आधार Q के अवनमन कोण क्रमशः  $15^\circ$  व  $60^\circ$  हैं। B व Q एक ही क्षैतिज तल पर हैं। यदि AB पर एक बिन्दु C इस प्रकार है कि  $CB = PQ$  है, तब चतुर्भुज BCPQ का क्षेत्रफल (वर्ग मीटर में) बराबर है:

**Options :**

71550511793.  $200(3 - \sqrt{3})$

71550511794.  $600(\sqrt{3} - 1)$

71550511795.  $300(\sqrt{3} - 1)$

71550511796.  $300(\sqrt{3} + 1)$

**Question Number : 20 Question Id : 7155053701 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Statement  $(P \Rightarrow Q) \wedge (R \Rightarrow Q)$  is logically equivalent to

**Options :**

71550511797.  $(P \Rightarrow R) \wedge (Q \Rightarrow R)$

71550511798.  $(P \wedge R) \Rightarrow Q$

71550511799.  $(P \Rightarrow R) \vee (Q \Rightarrow R)$

71550511800.  $(P \vee R) \Rightarrow Q$

**Question Number : 20 Question Id : 7155053701 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

कथन  $(P \Rightarrow Q) \wedge (R \Rightarrow Q)$  के तर्क संगत तुल्य कथन है:

**Options :**

71550511797.  $(P \Rightarrow R) \wedge (Q \Rightarrow R)$

71550511798.  $(P \wedge R) \Rightarrow Q$

71550511799.  $(P \Rightarrow R) \vee (Q \Rightarrow R)$

71550511800.  $(P \vee R) \Rightarrow Q$

## Mathematics Section B

<b>Section Id :</b>	715505224
<b>Section Number :</b>	2
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	10
<b>Number of Questions to be attempted :</b>	5
<b>Section Marks :</b>	20
<b>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes



**Maximum Instruction Time :** 0  
**Sub-Section Number :** 1  
**Sub-Section Id :** 715505224  
**Question Shuffling Allowed :** Yes  
**Is Section Default? :** null

**Question Number : 21 Question Id : 7155053702 Question Type : SA Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Let  $A = \{1, 2, 3, 4, \dots, 10\}$  and  $B = \{0, 1, 2, 3, 4\}$ . The number of elements in the relation  $R = \{(a, b) \in A \times A : 2(a - b)^2 + 3(a - b) \in B\}$  is \_\_\_\_\_

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number : 21 Question Id : 7155053702 Question Type : SA Calculator : None**  
**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

माना  $A = \{1, 2, 3, 4, \dots, 10\}$  और  $B = \{0, 1, 2, 3, 4\}$  हैं। सम्बन्ध  $R = \{(a, b) \in A \times A : 2(a - b)^2 + 3(a - b) \in B\}$  में अवयवों की संख्या है \_\_\_\_\_

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

Question Number : 22 Question Id : 7155053703 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let the point  $(p, p + 1)$  lie inside the region

$E = \{(x, y) : 3 - x \leq y \leq \sqrt{9 - x^2}, 0 \leq x \leq 3\}$ . If the set of all values of  $p$  is the interval  $(a, b)$ , then  $b^2 + b - a^2$  is equal to \_\_\_\_\_

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Question Number : 22 Question Id : 7155053703 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना बिन्दु  $(p, p + 1)$  क्षेत्र  $E = \{(x, y) : 3 - x \leq y \leq \sqrt{9 - x^2}, 0 \leq x \leq 3\}$  के अन्दर स्थित है। यदि  $p$  के सभी मानों का समुच्चय अन्तराल  $(a, b)$  है, तब  $b^2 + b - a^2$  बराबर है \_\_\_\_\_

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Question Number : 23 Question Id : 7155053704 Question Type : SA Calculator : None

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The number of ways of giving 20 distinct oranges to 3 children such that each child gets at least one orange is \_\_\_\_\_

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

**Question Number : 23 Question Id : 7155053704 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

20 भिन्न संतरों को 3 बच्चों में बाँटने के तरीकों, ताकि प्रत्येक बच्चे को कम से कम एक संतरा मिले, की संख्या है \_\_\_\_\_

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

**Question Number : 24 Question Id : 7155053705 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The coefficient of  $x^{18}$  in the expansion of  $\left(x^4 - \frac{1}{x^3}\right)^{15}$  is \_\_\_\_\_

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 24 **Question Id :** 7155053705 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

$\left(x^4 - \frac{1}{x^3}\right)^{15}$  के प्रसार में  $x^{18}$  का गुणांक है \_\_\_\_\_

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 25 **Question Id :** 7155053706 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

Let  $a \in \mathbb{Z}$  and  $[t]$  be the greatest integer  $\leq t$ . Then the number of points, where the function  $f(x) = [a + 13 \sin x]$ ,  $x \in (0, \pi)$  is not differentiable, is \_\_\_\_\_

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

Question Number : 25 Question Id : 7155053706 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना  $a \in \mathbb{Z}$  है तथा  $[t]$  महत्तम पूर्णांक  $\leq t$  है। तब उन बिंदुओं, जहाँ  $f(x) = [a + 13 \sin x]$ ,  $x \in (0, \pi)$  अवकलनीय नहीं है, की संख्या है \_\_\_\_\_

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Question Number : 26 Question Id : 7155053707 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If the area of the region  $S = \{(x, y) : 2y - y^2 \leq x^2 \leq 2y, x \geq y\}$  is equal to  $\frac{n+2}{n+1} - \frac{\pi}{n-1}$ , then the natural number  $n$  is equal to \_\_\_\_\_

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Question Number : 26 Question Id : 7155053707 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

यदि क्षेत्र  $S = \{(x, y) : 2y - y^2 \leq x^2 \leq 2y, x \geq y\}$  का क्षेत्रफल  $\frac{n+2}{n+1} - \frac{\pi}{n-1}$  के बराबर है, तब प्राकृतिक संख्या  $n$  बराबर है \_\_\_\_\_

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 27 **Question Id :** 7155053708 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

A circle passing through the point  $P(\alpha, \beta)$  in the first quadrant touches the two coordinate axes at the points A and B. The point P is above the line AB. The point Q on the line segment AB is the foot of perpendicular from P on AB. If PQ is equal to 11 units, then the value of  $\alpha\beta$  is \_\_\_\_\_

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 27 **Question Id :** 7155053708 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

प्रथम चतुर्थांश में बिंदु  $P(\alpha, \beta)$  से होकर जाने वाला एक वृत्त, निर्देशांक अक्षों को बिंदुओं A तथा B पर स्पर्श करता है। बिंदु P, रेखा AB से ऊपर है। बिंदु P से AB पर डाले गए लंब का पाद रेखाखंड AB पर बिंदु Q है। यदि  $PQ = 11$  इकाई है, तो  $\alpha\beta$  का मान है \_\_\_\_\_

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 28 **Question Id :** 7155053709 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

Let the tangent to the curve  $x^2 + 2x - 4y + 9 = 0$  at the point  $P(1, 3)$  on it meet the  $y$ -axis at  $A$ . Let the line passing through  $P$  and parallel to the line  $x - 3y = 6$  meet the parabola  $y^2 = 4x$  at  $B$ . If  $B$  lies on the line  $2x - 3y = 8$ , then  $(AB)^2$  is equal to \_\_\_\_\_

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 28 **Question Id :** 7155053709 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

माना वक्र  $x^2 + 2x - 4y + 9 = 0$  के बिंदु  $P(1, 3)$  पर स्पर्श रेखा  $y$ - अक्ष को बिंदु  $A$  पर मिलती है। माना  $P$  से होकर जाने वाली तथा  $x - 3y = 6$  के समांतर रेखा, परवलय  $y^2 = 4x$  को बिंदु  $B$  पर मिलती है। यदि बिंदु  $B$ , रेखा  $2x - 3y = 8$  पर है, तो  $(AB)^2$  बराबर है \_\_\_\_\_

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 29 **Question Id :** 7155053710 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

Let  $y = y(x)$  be a solution of the differential equation  $(x \cos x)dy + (xy \sin x + y \cos x - 1)dx = 0$ ,  $0 < x < \frac{\pi}{2}$ .

If  $\frac{\pi}{3}y\left(\frac{\pi}{3}\right) = \sqrt{3}$ , then  $\left|\frac{\pi}{6}y''\left(\frac{\pi}{6}\right) + 2y'\left(\frac{\pi}{6}\right)\right|$  is equal to \_\_\_\_\_

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 29 **Question Id :** 7155053710 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

माना अवकल समीकरण  $(x \cos x) dy + (xy \sin x + y \cos x - 1) dx = 0$ ,  $0 < x < \frac{\pi}{2}$  का

हल  $y = y(x)$  है। यदि  $\frac{\pi}{3}y\left(\frac{\pi}{3}\right) = \sqrt{3}$  है, तब  $\left|\frac{\pi}{6}y''\left(\frac{\pi}{6}\right) + 2y'\left(\frac{\pi}{6}\right)\right|$  का मान

है \_\_\_\_\_

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText



**Possible Answers :**

10

**Question Number : 30 Question Id : 7155053711 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Let the image of the point  $P(1, 2, 3)$  in the plane  $2x - y + z = 9$  be  $Q$ . If the coordinates of the point  $R$  are  $(6, 10, 7)$ , then the square of the area of the triangle  $PQR$  is \_\_\_\_\_

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

**Question Number : 30 Question Id : 7155053711 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

माना समतल  $2x - y + z = 9$  में बिन्दु  $P(1, 2, 3)$  का प्रतिबिम्ब  $Q$  है। यदि बिन्दु  $R$  के निर्देशांक  $(6, 10, 7)$  हैं, तब त्रिभुज  $PQR$  के क्षेत्रफल का वर्ग है \_\_\_\_\_

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

# Physics Section A

<b>Section Id :</b>	715505225
<b>Section Number :</b>	3
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	20
<b>Number of Questions to be attempted :</b>	20
<b>Section Marks :</b>	80
<b>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes
<b>Maximum Instruction Time :</b>	0
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	715505225
<b>Question Shuffling Allowed :</b>	Yes
<b>Is Section Default? :</b>	null

**Question Number : 31 Question Id : 7155053712 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

By what percentage will the transmission range of a TV tower be affected when the height of the tower is increased by 21% ?

**Options :**

71550511811. 14%

71550511812. 10%

71550511813. 12%

71550511814. 15%

Question Number : 31 Question Id : 7155053712 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

जब टॉवर की उँचाई 21% बढ़ा दी जाये तो एक टीवी टॉवर का प्रसारण परास किस प्रतिशत से प्रभावित होगा ?

Options :

71550511811. 14%

71550511812. 10%

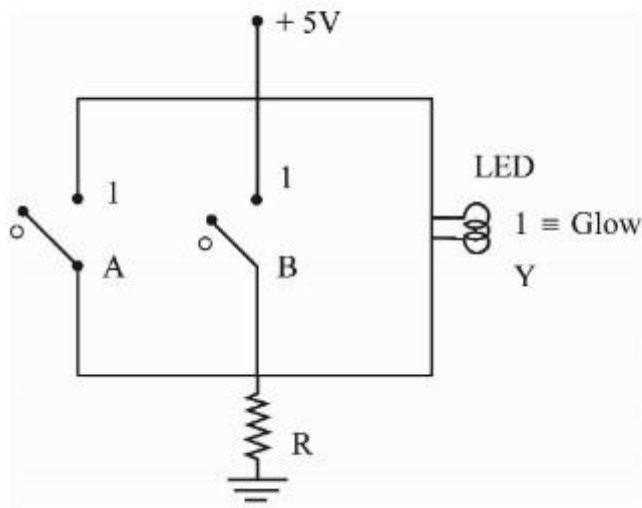
71550511813. 12%

71550511814. 15%

Question Number : 32 Question Id : 7155053713 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Name the logic gate equivalent to the diagram attached



Options :

71550511815. NAND

71550511816. NOR

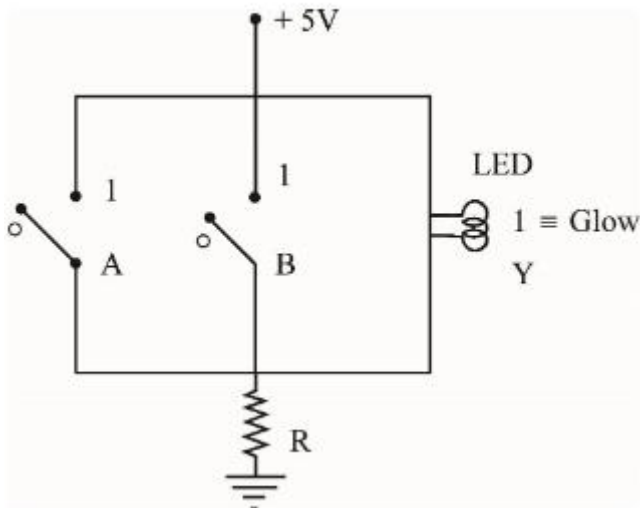
71550511817. AND

71550511818. OR

**Question Number : 32 Question Id : 7155053713 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

प्रदर्शित चित्र के समतुल्य लॉजिक गेट का नाम है:



**Options :**

71550511815. NAND

71550511816. NOR

71550511817. AND

71550511818. OR

Question Number : 33 Question Id : 7155053714 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

A small ball of mass  $M$  and density  $\rho$  is dropped in a viscous liquid of density  $\rho_0$ . After some time, the ball falls with a constant velocity. What is the viscous force on the ball ?

Options :

71550511819. 
$$F = Mg \left( 1 - \frac{\rho_0}{\rho} \right)$$

71550511820. 
$$F = Mg \left( 1 + \frac{\rho_0}{\rho} \right)$$

71550511821. 
$$F = Mg \left( 1 + \frac{\rho}{\rho_0} \right)$$

71550511822. 
$$F = Mg (1 \pm \rho\rho_0)$$

Question Number : 33 Question Id : 7155053714 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

$M$  द्रव्यमान तथा  $\rho$  घनत्व की एक छोटी गेंद  $\rho_0$  घनत्व के एक श्यान द्रव में गिरती है। कुछ समय पश्चात्, गेंद एक नियत वेग से नीचे गिरती है। गेंद पर श्यान बल क्या है?

Options :

71550511819. 
$$F = Mg \left( 1 - \frac{\rho_0}{\rho} \right)$$

71550511820.

$$F = Mg \left( 1 + \frac{\rho_o}{\rho} \right)$$

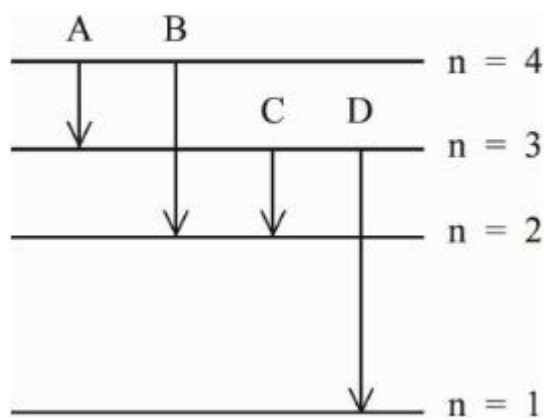
71550511821. 
$$F = Mg \left( 1 + \frac{\rho}{\rho_o} \right)$$

71550511822. 
$$F = Mg (1 \pm \rho\rho_o)$$

**Question Number : 34 Question Id : 7155053715 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The energy levels of an hydrogen atom are shown below. The transition corresponding to emission of shortest wavelength is



**Options :**

71550511823. A

71550511824. B

71550511825. C

71550511826. D

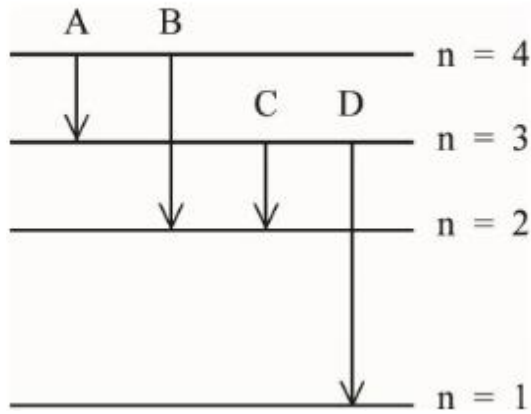
Question Number : 34 Question Id : 7155053715 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

एक हाइड्रोजन परमाणु के ऊर्जा स्तरों को नीचे चित्र में दर्शाया गया है। न्यूनतम तरंग दैर्घ्य के संगत उत्सर्जन संक्रमण है:



Options :

71550511823. A

71550511824. B

71550511825. C

71550511826. D

Question Number : 35 Question Id : 7155053716 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The kinetic energy of an electron,  $\alpha$ -particle and a proton are given as 4 K, 2 K and K respectively. The de-Broglie wavelength associated with electron ( $\lambda_e$ ),  $\alpha$ -particle ( $\lambda_\alpha$ ) and the proton ( $\lambda_p$ ) are as follows:

Options :

71550511827.  $\lambda_\alpha > \lambda_p > \lambda_e$

71550511828.  $\lambda_\alpha < \lambda_p < \lambda_e$

71550511829.  $\lambda_\alpha = \lambda_p < \lambda_e$

71550511830.  $\lambda_\alpha = \lambda_p > \lambda_e$

**Question Number : 35 Question Id : 7155053716 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

एक इलैक्ट्रॉन,  $\alpha$ -कण एवं एक प्रोटॉन की गतिज ऊर्जा क्रमशः  $4K$ ,  $2K$  एवं  $K$  है।  
इलैक्ट्रॉन,  $\alpha$ -कण तथा प्रोटॉन से सम्बन्धित डी-ब्रॉग्ली तरंगदैर्घ्य क्रमशः  $\lambda_e$ ,  $\lambda_\alpha$  तथा  $\lambda_p$  इस प्रकार हैं:

**Options :**

71550511827.  $\lambda_\alpha > \lambda_p > \lambda_e$

71550511828.  $\lambda_\alpha < \lambda_p < \lambda_e$

71550511829.  $\lambda_\alpha = \lambda_p < \lambda_e$

71550511830.  $\lambda_\alpha = \lambda_p > \lambda_e$

**Question Number : 36 Question Id : 7155053717 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A monochromatic light wave with wavelength  $\lambda_1$  and frequency  $\nu_1$  in air enters another medium. If the angle of incidence and angle of refraction at the interface are  $45^\circ$  and  $30^\circ$  respectively, then the wavelength  $\lambda_2$  and frequency  $\nu_2$  of the refracted wave are:



**Options :**

71550511831.  $\lambda_2 = \sqrt{2}\lambda_1, v_2 = v_1$

71550511832.  $\lambda_2 = \frac{1}{\sqrt{2}}\lambda_1, v_2 = v_1$

71550511833.  $\lambda_2 = \lambda_1, v_2 = \frac{1}{\sqrt{2}}v_1$

71550511834.  $\lambda_2 = \lambda_1, v_2 = \sqrt{2}v_1$

**Question Number : 36 Question Id : 7155053717 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

वायु में  $\lambda_1$  तरंगदैर्घ्य एवं  $v_1$  आवृत्ति की एक एकवर्णी प्रकाश तरंग दूसरे माध्यम में प्रवेश करती है। यदि अन्तः सतह पर आपतन कोण तथा अपवर्तन कोण क्रमशः  $45^\circ$  व  $30^\circ$  हैं। तब अपवर्तित तरंग की तरंगदैर्घ्य  $\lambda_2$  व आवृत्ति  $v_2$  है:

**Options :**

71550511831.  $\lambda_2 = \sqrt{2}\lambda_1, v_2 = v_1$

71550511832.  $\lambda_2 = \frac{1}{\sqrt{2}}\lambda_1, v_2 = v_1$

71550511833.  $\lambda_2 = \lambda_1, v_2 = \frac{1}{\sqrt{2}}v_1$

71550511834.  $\lambda_2 = \lambda_1, v_2 = \sqrt{2}v_1$

**Question Number : 37 Question Id : 7155053718 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

For the plane electromagnetic wave given by  $E = E_0 \sin(\omega t - kx)$  and  $B = B_0 \sin(\omega t - kx)$ , the ratio of average electric energy density to average magnetic energy density is

**Options :**

71550511835. 1

71550511836. 2

71550511837. 4

71550511838. 1/2

**Question Number : 37 Question Id : 7155053718 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

समतल वैद्युत चंबकीय तरंग के लिए  $E = E_0 \sin(\omega t - kx)$  एवं  $B = B_0 \sin(\omega t - kx)$  हैं, औसत विद्युत ऊर्जा घनत्व तथा औसत चुम्बकीय ऊर्जा घनत्व का अनुपात है:

**Options :**

71550511835. 1

71550511836. 2

71550511837. 4

71550511838. 1/2

**Question Number : 38 Question Id : 7155053719 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The induced emf can be produced in a coil by

- A. moving the coil with uniform speed inside uniform magnetic field
- B. moving the coil with non uniform speed inside uniform magnetic field
- C. rotating the coil inside the uniform magnetic field
- D. changing the area of the coil inside the uniform magnetic field

Choose the correct answer from the options given below:

**Options :**

71550511839. A and C only

71550511840. B and C only

71550511841. C and D only

71550511842. B and D only

**Question Number : 38 Question Id : 7155053719 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

एक कुण्डली में प्रेरित विद्युत वाहक बल उत्पन्न किया जा सकता है:

- A. एक समान चुम्बकीय क्षेत्र में कुण्डली की एकसमान चाल से गति द्वारा
- B. एकसमान चुम्बकीय क्षेत्र में कुण्डली की असमान चाल से गति द्वारा
- C. एकसमान चुम्बकीय क्षेत्र में कुण्डली के घूर्णन द्वारा
- D. एकसमान चुम्बकीय क्षेत्र में कुण्डली के क्षेत्रफल में परिवर्तन द्वारा

नीचे दिए गए विकल्पों में से सही उत्तर चुनिए:

**Options :**

71550511839. केवल A तथा C

71550511840. केवल B तथा C

71550511841. केवल C तथा D

71550511842. केवल B तथा D

**Question Number : 39 Question Id : 7155053720 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A particle is moving with constant speed in a circular path. When the particle turns by an angle  $90^\circ$ , the ratio of instantaneous velocity to its average velocity is

$\pi : x\sqrt{2}$ . The value of  $x$  will be -

**Options :**

71550511843. 7

71550511844. 5

71550511845. 2

71550511846. 1

**Question Number : 39 Question Id : 7155053720 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

एक कण किसी वृत्ताकार पथ पर नियत चाल से गति कर रहा है। जब कण  $90^\circ$  के कोण से घूमता है, तो इसके क्षणिक वेग तथा औसत वेग का अनुपात  $\pi : x\sqrt{2}$  है।  $x$  का मान होगा:

**Options :**

71550511843. 7

71550511844. 5

71550511845. 2

71550511846. 1

**Question Number : 40 Question Id : 7155053721 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A long straight wire of circular cross-section (radius  $a$ ) is carrying steady current  $I$ . The current  $I$  is uniformly distributed across this cross-section. The magnetic field is

**Options :**

71550511847. uniform in the region  $r < a$  and inversely proportional to distance  $r$  from the axis, in the region  $r > a$

71550511848. zero in the region  $r < a$  and inversely proportional to  $r$  in the region  $r > a$

71550511849. directly proportional to  $r$  in the region  $r < a$  and inversely proportional to  $r$  in the region  $r > a$

71550511850. inversely proportional to  $r$  in the region  $r < a$  and uniform throughout in the region  $r > a$

**Question Number : 40 Question Id : 7155053721 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

वृत्ताकार अनुप्रस्थ परिच्छेद (त्रिज्या- $a$ ) के एक लम्बे सीधे तार में प्रवाहित स्थाई धारा  $I$  है। धारा  $I$  इस अनुप्रस्थ परिच्छेद में एकसमान रूप से वितरित है। चुम्बकीय क्षेत्र है:

**Options :**

71550511847.  $r < a$  परिसर में एकसमान एवं  $r > a$  परिसर में अक्ष से दूरी  $r$  के व्युत्क्रमानुपाती

71550511848.  $r < a$  परिसर में शून्य एवं  $r > a$  परिसर में  $r$  के व्युत्क्रमानुपाती

71550511849.  $r < a$  परिसर  $r$  के समानुपाती एवं  $r > a$  परिसर में  $r$  के व्युत्क्रमानुपाती

71550511850.  $r < a$  परिसर में  $r$  के व्युत्क्रमानुपाती एवं  $r > a$  संपूर्ण परिसर में एकसमान

**Question Number : 41 Question Id : 7155053722 Question Type : MCQ Option Shuffling : Yes Is**

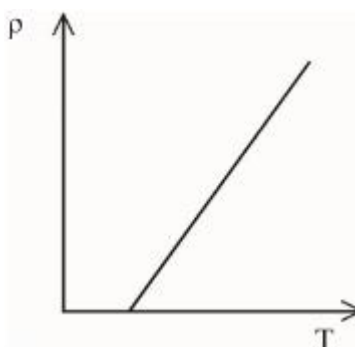
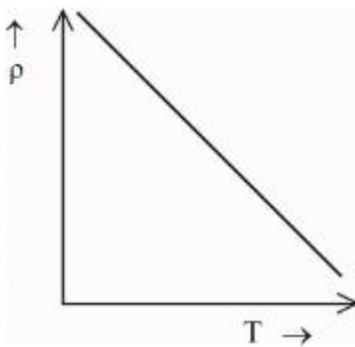
**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

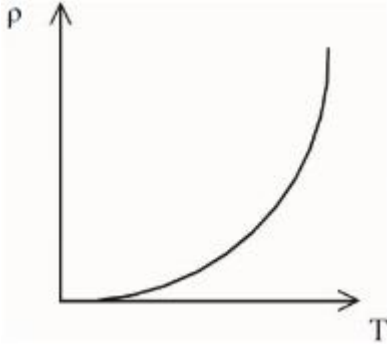
**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

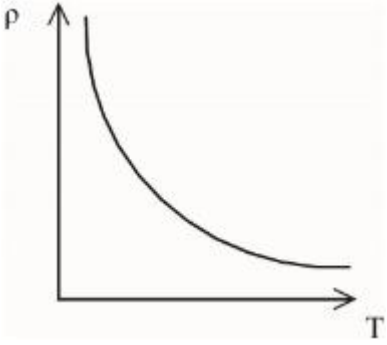
The resistivity ( $\rho$ ) of semiconductor varies with temperature. Which of the following curve represents the correct behaviour

**Options :**





71550511853.



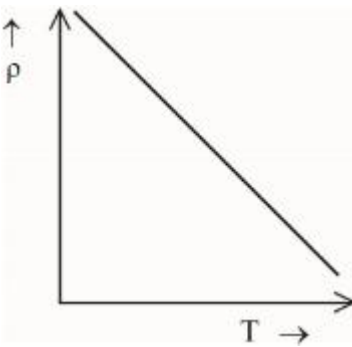
71550511854.

**Question Number : 41 Question Id : 7155053722 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

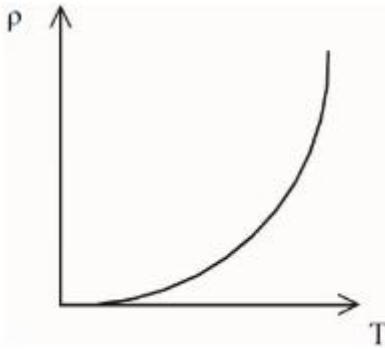
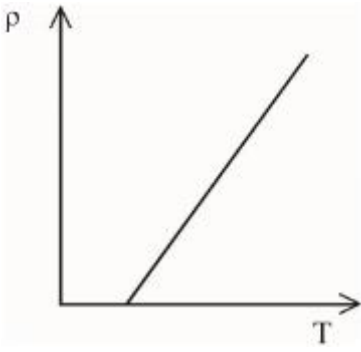
अर्ध चालक की प्रतिरोधकता ( $\rho$ ) ताप के साथ बदलती है। निम्न में से कौन सा वक्र सही व्यवहार प्रदर्शित करता है:

**Options :**

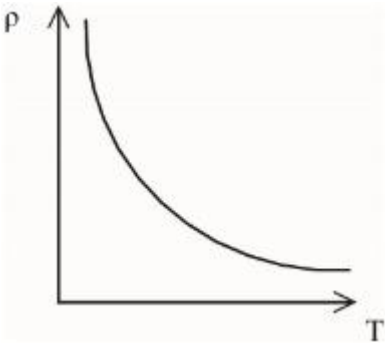


71550511851.

71550511852.



71550511853.

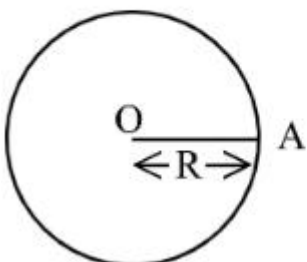


71550511854.

**Question Number : 42 Question Id : 7155053723 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

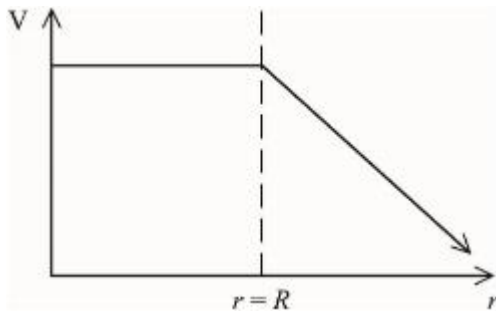
**Correct Marks : 4 Wrong Marks : 1**

For a uniformly charged thin spherical shell, the electric potential (V) radially away from the centre (O) of shell can be graphically represented as -

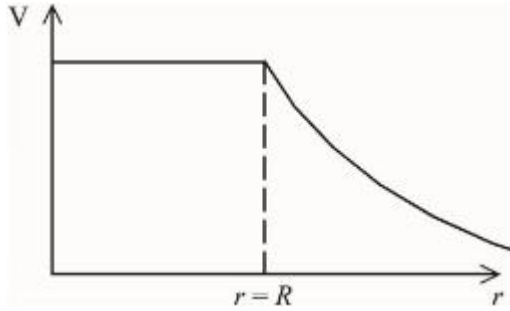


**Options :**

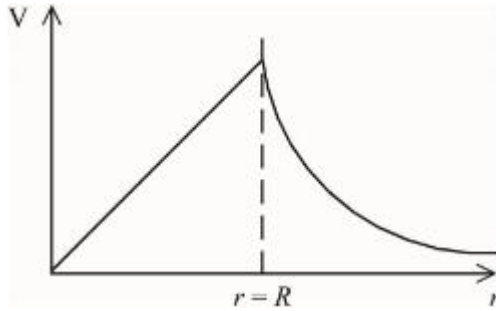




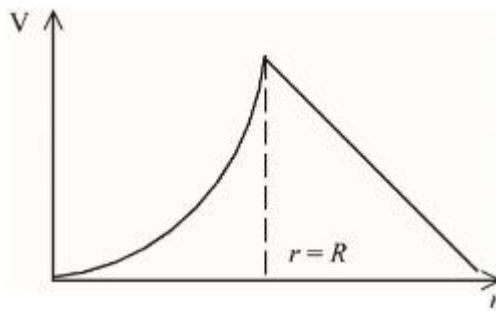
71550511855.



71550511856.



71550511857.



71550511858.

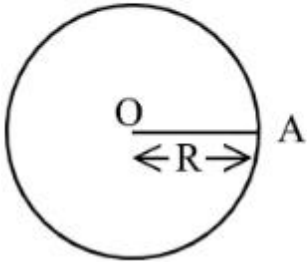
Question Number : 42 Question Id : 7155053723 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

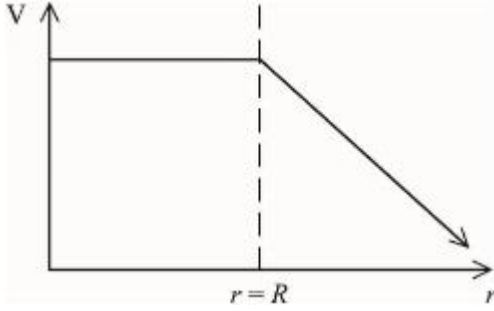
Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

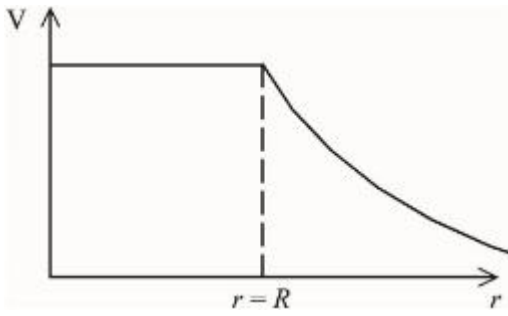
एकसमान आवेशित एक पतले गोलीय कोश के लिए, कोश के केन्द्र (O) से त्रिज्या के अनुदिश बाहर की ओर विद्युत विभव (V) को निम्न ग्राफ द्वारा प्रदर्शित किया जा सकता है:-



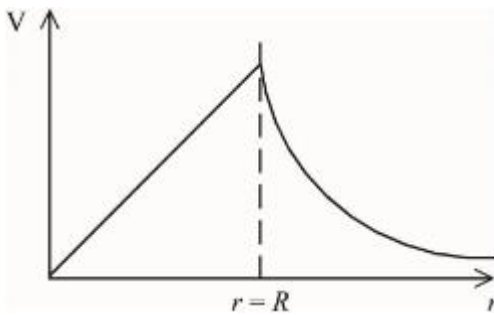
Options :



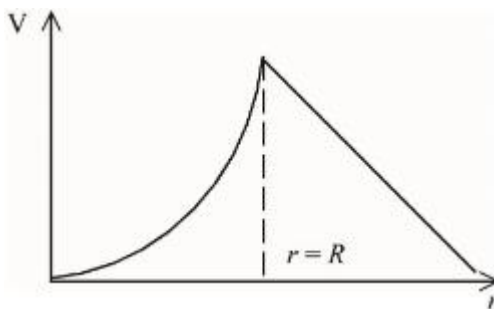
71550511855.



71550511856.



71550511857.

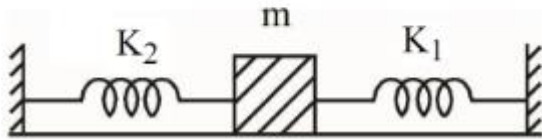


71550511858.

Question Number : 43 Question Id : 7155053724 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

A mass  $m$  is attached to two strings as shown in figure. The spring constants of two springs are  $K_1$  and  $K_2$ . For the frictionless surface, the time period of oscillation of mass  $m$  is



Options :

71550511859.  $2\pi \sqrt{\frac{m}{K_1 + K_2}}$

71550511860.  $2\pi \sqrt{\frac{m}{K_1 - K_2}}$

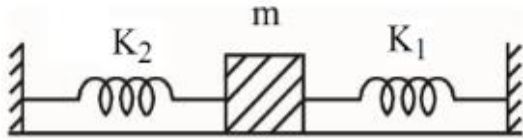
71550511861.  $\frac{1}{2\pi} \sqrt{\frac{K_1 + K_2}{m}}$

71550511862.  $\frac{1}{2\pi} \sqrt{\frac{K_1 - K_2}{m}}$

Question Number : 43 Question Id : 7155053724 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

प्रदर्शित चित्र में एक द्रव्यमान  $m$  दो स्प्रिंगों से जुड़ा है। दोनों स्प्रिंगों के स्प्रिंग नियतांक  $K_1$  व  $K_2$  है। घर्षण रहित सतह के लिए, द्रव्यमान  $m$  के दोलन का आवर्तकाल है:



Options :

71550511859.  $2\pi \sqrt{\frac{m}{K_1 + K_2}}$

71550511860.  $2\pi \sqrt{\frac{m}{K_1 - K_2}}$

71550511861.  $\frac{1}{2\pi} \sqrt{\frac{K_1 + K_2}{m}}$

71550511862.  $\frac{1}{2\pi} \sqrt{\frac{K_1 - K_2}{m}}$

**Question Number : 44 Question Id : 7155053725 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A source supplies heat to a system at the rate of 1000 W. If the system performs work at a rate of 200 W. The rate at which internal energy of the system increases is

Options :

71550511863. 500 W

71550511864. 600 W

71550511865. 1200 W

71550511866. 800 W

**Question Number : 44 Question Id : 7155053725 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

एक स्रोत 1000 W की दर से एक निकाय को ऊष्मा प्रदान करता है। यदि निकाय 200 W की दर से कार्य करता है। वह दर, जिस पर निकाय की आन्तरिक ऊर्जा बढ़ती है:

**Options :**

71550511863. 500 W

71550511864. 600 W

71550511865. 1200 W

71550511866. 800 W

**Question Number : 45 Question Id : 7155053726 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The number of air molecules per  $\text{cm}^3$  increased from  $3 \times 10^{19}$  to  $12 \times 10^{19}$ . The ratio of collision frequency of air molecules before and after the increase in number respectively is :

**Options :**

71550511867. 0.25

71550511868. 0.50

71550511869. 0.75

71550511870. 1.25

**Question Number : 45 Question Id : 7155053726 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

प्रति घन सेमी. वायु अणुओं की संख्या  $3 \times 10^{19}$  से  $12 \times 10^{19}$  तक बढ़ जाती है। वायु अणुओं की संख्या में वृद्धि के पूर्व एवं बाद में क्रमशः संघट्ट आवृत्ति का अनुपात है:

**Options :**

71550511867. 0.25

71550511868. 0.50

71550511869. 0.75

71550511870. 1.25

**Question Number : 46 Question Id : 7155053727 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Two resistances are given as  $R_1 = (10 \pm 0.5) \Omega$  and  $R_2 = (15 \pm 0.5) \Omega$ . The percentage error in the measurement of equivalent resistance when they are connected in parallel is -

**Options :**

71550511871. 4.33

71550511872. 6.33

71550511873. 2.33

71550511874. 5.33

**Question Number : 46 Question Id : 7155053727 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

दो प्रतिरोध इस प्रकार दिये गये हैं  $R_1 = (10 \pm 0.5) \Omega$  एवं  $R_2 = (15 \pm 0.5) \Omega$ । जब यह समान्तर श्रेणी में जुड़े हो तब तुल्य प्रतिरोध के मापन में प्रतिशत त्रुटि है:

**Options :**

71550511871. 4.33

71550511872. 6.33

71550511873. 2.33

71550511874. 5.33

**Question Number : 47 Question Id : 7155053728 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements : one is labelled as **Assertion A** and the other is labelled as **Reason R**.

**Assertion A :** When a body is projected at an angle  $45^\circ$ , its range is maximum.

**Reason R :** For maximum range, the value of  $\sin 2\theta$  should be equal to one.

In the light of the above statements, choose the **correct** answer from the options given below:

**Options :**

71550511875. Both **A** and **R** are correct and **R** is the correct explanation of **A**

71550511876. Both **A** and **R** are correct but **R** is **NOT** the correct explanation of **A**

71550511877. **A** is true but **R** is false

71550511878. **A** is false but **R** is true

**Question Number : 47 Question Id : 7155053728 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

नीचे दो कथन दिये गये हैं: एक को **अभिकथन A** तथा दूसरे को **कारण R** से चिह्नित किया गया है।

**अभिकथन A** : जब एक पिण्ड को  $45^\circ$  के कोण पर प्रक्षेपित किया जाता है, इसका परास अधिकतम है।

**कारण R** : अधिकतम परास के लिए,  $\sin 2\theta$  का मान एक के बराबर हो ना चाहिए।

उपरोक्त कथनों के संदर्भ में नीचे दिये गये विकल्पों में से **सही** उत्तर चुनिए:

**Options :**

71550511875. **A** व **R** दोनों सही हैं और **R**, **A** की सही व्याख्या है

71550511876. **A** व **R** दोनों सही हैं परन्तु **R**, **A** की सही व्याख्या नहीं है

71550511877. **A** सही है परन्तु **R** सही नहीं है

71550511878. **A** सही नहीं है परन्तु **R** सही है



**Question Number : 48 Question Id : 7155053729 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A small block of mass 100 g is tied to a spring of spring constant 7.5 N/m and length 20 cm. The other end of spring is fixed at a particular point A. If the block moves in a circular path on a smooth horizontal surface with constant angular velocity 5 rad/s about point A, then tension in the spring is -

**Options :**

71550511879. 0.25 N

71550511880. 0.50 N

71550511881. 0.75 N

71550511882. 1.5 N

**Question Number : 48 Question Id : 7155053729 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

100 g द्रव्यमान के एक छोटे गुटके को 20 cm लम्बे एवं 7.5 N/m स्प्रिंग नियतांक के एक स्प्रिंग से बाँधा गया है। स्प्रिंग का दूसरा सिरा एक निश्चित बिन्दु A से जुड़ा है। यदि गुटका बिन्दु A के परितः 5 rad/s नियत कोणीय वेग से एक चिकने क्षैतिज तल पर एक वृत्ताकार कक्षा में गति करता है। स्प्रिंग में तनाव है:

**Options :**

71550511879. 0.25 N

71550511880. 0.50 N

71550511881. 0.75 N

71550511882. 1.5 N

**Question Number : 49 Question Id : 7155053730 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements : one is labelled as **Assertion A** and the other is labelled as **Reason R**.

**Assertion A** : Earth has atmosphere whereas moon doesn't have any atmosphere.

**Reason R** : The escape velocity on moon is very small as compared to that on earth.

In the light of the above statements, choose the correct answer from the options given below:

**Options :**

71550511883. Both A and R are correct and R is the correct explanation of A

71550511884. Both A and R are correct but R is NOT the correct explanation of A

71550511885. A is true but R is false

71550511886. A is false but R is true

**Question Number : 49 Question Id : 7155053730 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

नीचे दो कथन दिये गये हैं: एक को **अभिकथन A** तथा दूसरे को **कारण R** से चिह्नित किया गया है।

**अभिकथन A** : पृथ्वी का वायुमण्डल है जबकि चन्द्रमा का कोई वायुमण्डल नहीं है।

**कारण R** : पृथ्वी की तुलना में चन्द्रमा पर पलायन वेग बहुत कम होता है।

उपरोक्त कथनों के संदर्भ में, नीचे दिये गये विकल्पों में से सही उत्तर चुनिए:

**Options :**

71550511883. A व R दोनों सही हैं और R, A की सही व्याख्या है

71550511884. A व R दोनों सही हैं परन्तु R, A की सही व्याख्या नहीं है

71550511885. A सही है परन्तु R सही नहीं है

71550511886. A सही नहीं है परन्तु R सही है

**Question Number : 50 Question Id : 7155053731 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A planet has double the mass of the earth. Its average density is equal to that of the earth. An object weighing  $W$  on earth will weigh on that planet:

**Options :**

71550511887.  $W$

71550511888.  $2W$

71550511889.  $2^{2/3}W$

71550511890.  $2^{1/3}W$

Question Number : 50 Question Id : 7155053731 Question Type : MCQ Option Shuffling : Yes Is  
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum  
Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

एक ग्रह का द्रव्यमान पृथ्वी के द्रव्यमान से दो गुना है। इसका औसत घनत्व पृथ्वी के घनत्व के बराबर है। एक वस्तु का पृथ्वी पर मापा गया भार  $W$  है तो उस ग्रह पर भार होगा:

Options :

71550511887.  $W$

71550511888.  $2W$

71550511889.  $2^{2/3}W$

71550511890.  $2^{1/3}W$

## Physics Section B

Section Id :	715505226
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	715505226

**Question Shuffling Allowed :**

Yes

**Is Section Default? :**

null

**Question Number : 51 Question Id : 7155053732 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A person driving car at a constant speed of 15 m/s is approaching a vertical wall. The person notices a change of 40 Hz in the frequency of his car's horn upon reflection from the wall. The frequency of horn is \_\_\_\_\_ Hz.

(Given: Speed of sound : 330 m/s)

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number : 51 Question Id : 7155053732 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

एक व्यक्ति 15 m/s की एक नियत चाल से कार चलाते हुए एक उर्ध्वाधर दीवार की ओर पहुँच रहा है। हॉर्न की ध्वनि के दीवार से परावर्तन होने पर, व्यक्ति कार के हॉर्न की आवृत्ति में 40 Hz का परिवर्तन प्राप्त करता है। हॉर्न की आवृत्ति \_\_\_\_\_ Hz है।

(दिया है, ध्वनि की चाल : 330 m/s)

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number : 52 Question Id : 7155053733 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A pole is vertically submerged in swimming pool, such that it gives a length of shadow 2.15 m within water when sunlight is incident at an angle of  $30^\circ$  with the surface of water. If swimming pool is filled to a height of 1.5 m, then the height of the pole above the water surface in centimeters is ( $n_w = 4/3$ ) \_\_\_\_\_

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

**Question Number : 52 Question Id : 7155053733 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

एक खम्भा स्विमिंग पूल में ऊर्ध्वाधरतः इस प्रकार खड़ा है कि वह पानी के अन्दर 2.15 m लम्बी छाया देता है जब सूर्य की किरणें पानी की सतह के साथ  $30^\circ$  के कोण पर आपतित होती है। यदि स्विमिंग पूल 1.5 m की ऊँचाई तक भरा हुआ हो, तो पानी की सतह के ऊपर खम्भे की ऊँचाई (सेमी.में) \_\_\_\_\_ है ( $n_w = 4/3$ ) ।

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

**Question Number : 53 Question Id : 7155053734 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The radius of fifth orbit of the  $\text{Li}^{++}$  is \_\_\_\_\_  $\times 10^{-12}$  m.

Take: radius of hydrogen atom = 0.51 Å

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number : 53 Question Id : 7155053734 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

$\text{Li}^{++}$  की पाँचवी कक्षा की त्रिज्या \_\_\_\_\_  $\times 10^{-12}$  m है

( हाइड्रोजन परमाणु की त्रिज्या = 0.51 Å लें )

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number : 54 Question Id : 7155053735 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

An ideal transformer with purely resistive load operates at 12 kV on the primary side. It supplies electrical energy to a number of nearby houses at 120 V. The average rate of energy consumption in the houses served by the transformer is 60 kW. The value of resistive load ( $R_s$ ) required in the secondary circuit will be \_\_\_\_\_  $\text{m}\Omega$ .

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 54 **Question Id :** 7155053735 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

एक आदर्श ट्रांसफार्मर प्राथमिक साइड पर 12 kV पर शुद्ध प्रतिरोधक लोड के साथ कार्य करता है। यह 120 V पर कई निकटवर्ती घरों को विद्युत ऊर्जा प्रदान करता है। ट्रांसफार्मर द्वारा घरों में दी गई ऊर्जा खपत की औसत दर 60 kW है। द्वितीय परिपथ में आवश्यक प्रतिरोधक लोड ( $R_s$ ) का मान \_\_\_\_\_  $m\Omega$  होगा।

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 55 **Question Id :** 7155053736 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

The length of a metallic wire is increased by 20% and its area of cross section is reduced by 4%. The percentage change in resistance of the metallic wire is

\_\_\_\_\_

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes



Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Question Number : 55 Question Id : 7155053736 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

एक धात्विक तार की लम्बाई 20% बढ़ा दी जाती है और इसके अनुप्रस्थ परिच्छेद का क्षेत्रफल 4% घटा दिया जाता है। धात्विक तार के प्रतिरोध में प्रतिशत परिवर्तन \_\_\_\_\_ है।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

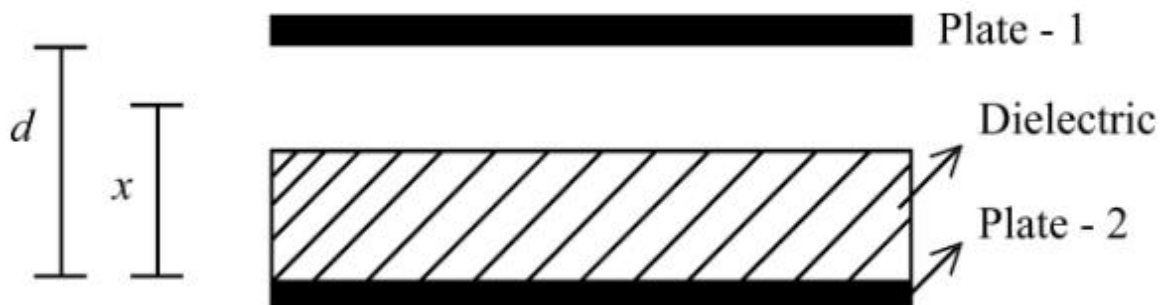
10

Question Number : 56 Question Id : 7155053737 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

A parallel plate capacitor with plate area  $A$  and plate separation  $d$  is filled with a dielectric material of dielectric constant  $K = 4$ . The thickness of the dielectric material is  $x$ , where  $x < d$ .



Let  $C_1$  and  $C_2$  be the capacitance of the system for  $x = \frac{1}{3}d$  and  $x = \frac{2d}{3}$ , respectively. If  $C_1 = 2\mu\text{F}$  the value of  $C_2$  is \_\_\_\_\_  $\mu\text{F}$

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

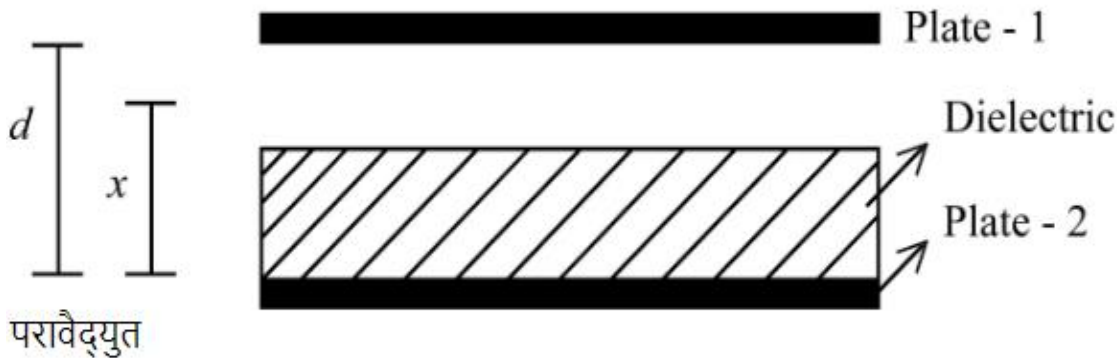
10

**Question Number :** 56 **Question Id :** 7155053737 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

प्लेट क्षेत्रफल  $A$  तथा प्लेटों के बीच की दूरी  $d$  के एक समान्तर प्लेट संधारित को  $K = 4$  परावैद्युतांक के परावैद्युत पदार्थ से भर दिया गया है। परावैद्युत पदार्थ की मोटाई  $x$  है, जहाँ  $x < d$ .



माना  $x = \frac{1}{3}d$  तथा  $x = \frac{2d}{3}$  के लिए निकाय की धारिताएं क्रमशः  $C_1$  व  $C_2$  हैं। यदि  $C_1 = 2\mu\text{F}$ ,  $C_2$  मान \_\_\_\_\_  $\mu\text{F}$  है।

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

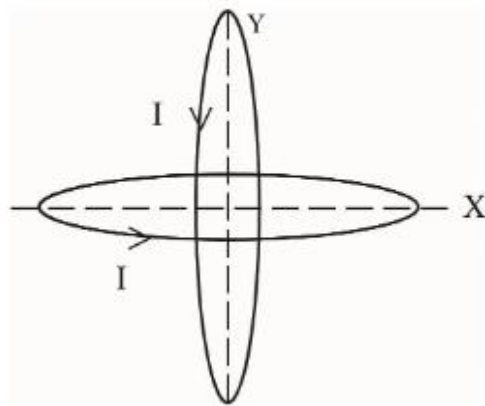
10

**Question Number :** 57 **Question Id :** 7155053738 **Question Type :** SA **Calculator :** None

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Two identical circular wires of radius 20 cm and carrying current  $\sqrt{2}$  A are placed in perpendicular planes as shown in figure. The net magnetic field at the centre of the circular wires is \_\_\_\_\_  $\times 10^{-8}$  T.



(Take  $\pi = 3.14$ )

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

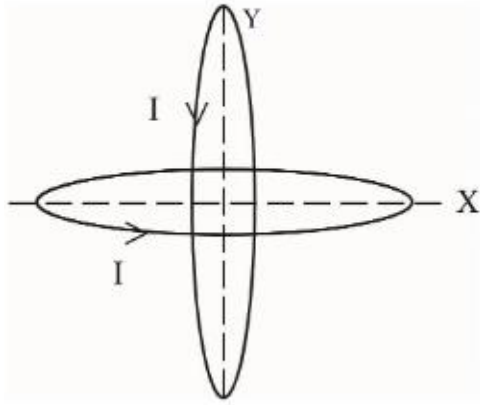
10

**Question Number : 57 Question Id : 7155053738 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

20 cm त्रिज्या के दो एकसमान वृत्ताकार तारों को चित्रानुसार लम्बवत तलों में रखा है और इनमें प्रवाहित धारा  $\sqrt{2}$  A है। वृत्ताकार तारों के केन्द्र पर कुल चुम्बकीय क्षेत्र \_\_\_\_\_  $\times 10^{-8}$  T है।



(लिया है,  $\pi = 3.14$ )

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 58 **Question Id :** 7155053739 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

A steel rod has a radius of 20 mm and a length of 2.0 m. A force of 62.8 kN stretches it along its length. Young's modulus of steel is  $2.0 \times 10^{11}$  N/m<sup>2</sup>. The longitudinal strain produced in the wire is \_\_\_\_\_  $\times 10^{-5}$

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number : 58 Question Id : 7155053739 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

एक स्टील छड़ की त्रिज्या 20 mm एवं लम्बाई 2.0 m है। 62.8 kN का बल इसे लम्बाई के अनुदिश खींचता है। स्टील का यंग प्रत्यास्थता गुणांक  $2.0 \times 10^{11}$  N/m<sup>2</sup> है। तार में उत्पन्न अनुदैर्घ्य विकृति \_\_\_\_\_  $\times 10^{-5}$  है।

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

**Question Number : 59 Question Id : 7155053740 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A particle of mass 10 g moves in a straight line with retardation  $2x$ , where  $x$  is the displacement in SI units. Its loss of kinetic energy for above displacement is

$\left(\frac{10}{x}\right)^{-n}$  J. The value of  $n$  will be \_\_\_\_\_

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

**Question Number : 59 Question Id : 7155053740 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

10 g द्रव्यमान का एक कण  $2x$  मंदन के साथ एक सरल रेखा में गति करता है, जहाँ  $x$ , SI मात्रक में विस्थापन है। उक्त विस्थापन के लिए इसकी गतिज ऊर्जा हास  $\left(\frac{10}{x}\right)^{-n}$  J है।  $n$

का मान \_\_\_\_\_ होगा।

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number : 60 Question Id : 7155053741 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Two identical solid spheres each of mass 2 kg and radii 10 cm are fixed at the ends of a light rod. The separation between the centres of the spheres is 40 cm. The moment of inertia of the system about an axis perpendicular to the rod passing through its middle point is \_\_\_\_\_  $\times 10^{-3}$  kg-m<sup>2</sup>

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number : 60 Question Id : 7155053741 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

2 kg द्रव्यमान तथा 10 cm त्रिज्या के दो एक समान ठोस गोलों को एक हल्की छड़ के किनारों पर जोड़ दिया गया है। गोलों के केन्द्रों के बीच की दूरी 40 cm है। छड़ के लम्बवत अक्ष, जो कि छड़ के मध्य बिन्दु से गुजरती है, के परितः निकाय का जड़त्व आघूर्ण \_\_\_\_\_  $\times 10^{-3} \text{ kg-m}^2$  है।

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

## Chemistry Section A

<b>Section Id :</b>	715505227
<b>Section Number :</b>	5
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	20
<b>Number of Questions to be attempted :</b>	20
<b>Section Marks :</b>	80
<b>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes
<b>Maximum Instruction Time :</b>	0
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	715505227
<b>Question Shuffling Allowed :</b>	Yes
<b>Is Section Default? :</b>	null

**Question Number :** 61 **Question Id :** 7155053742 **Question Type :** MCQ **Option Shuffling :** Yes **Is Question Mandatory :** No **Calculator :** None **Response Time :** N.A **Think Time :** N.A **Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

A compound is formed by two elements X and Y. The element Y forms cubic close packed arrangement and those of element X occupy one third of the tetrahedral voids. What is the formula of the compound ?

**Options :**

71550511901.  $XY_3$

71550511902.  $X_3Y$

71550511903.  $X_2Y_3$

71550511904.  $X_3Y_2$

**Question Number : 61 Question Id : 7155053742 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

एक यौगिक दो तत्वों X और Y से बना है। तत्व Y घनीय निविड संकुलन बनाता है और तत्व X चतुष्फलकीय रिक्तियों का एक तिहाई का घेरता है। यौगिक का सूत्र क्या है?

**Options :**

71550511901.  $XY_3$

71550511902.  $X_3Y$

71550511903.  $X_2Y_3$

71550511904.  $X_3Y_2$



Question Number : 62 Question Id : 7155053743 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

For a concentrated solution of a weak electrolyte ( $K_{eq}$  = equilibrium constant)  $A_2B_3$  of concentration 'c', the degree of dissociation ' $\alpha$ ' is

Options :

71550511905.  $\left(\frac{K_{eq}}{6c^5}\right)^{\frac{1}{5}}$

71550511906.  $\left(\frac{K_{eq}}{108c^4}\right)^{\frac{1}{5}}$

71550511907.  $\left(\frac{K_{eq}}{5c^4}\right)^{\frac{1}{5}}$

71550511908.  $\left(\frac{K_{eq}}{25c^2}\right)^{\frac{1}{5}}$

Question Number : 62 Question Id : 7155053743 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

किसी दुर्बल वैद्युत अपघट्य ( $K_{eq}$  = साम्यावस्था स्थिरांक)  $A_2B_3$ , जिसकी सान्द्रता 'c' है, के सान्द्र विलयन के लिये आयनन की मात्रा ' $\alpha$ ' है।

Options :

71550511905.

$$\left(\frac{K_{eq}}{6c^5}\right)^{\frac{1}{5}}$$

71550511906.  $\left(\frac{K_{eq}}{108c^4}\right)^{\frac{1}{5}}$

71550511907.  $\left(\frac{K_{eq}}{5c^4}\right)^{\frac{1}{5}}$

71550511908.  $\left(\frac{K_{eq}}{25c^2}\right)^{\frac{1}{5}}$

**Question Number : 63 Question Id : 7155053744 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Match List I with List II

LIST I - Enzymatic reaction		LIST II - Enzyme	
A.	Sucrose $\rightarrow$ Glucose and Fructose	I.	Zymase
B.	Glucose $\rightarrow$ ethyl alcohol and CO <sub>2</sub>	II.	Pepsin
C.	Starch $\rightarrow$ Maltose	III.	Invertase
D.	Proteins $\rightarrow$ Amino acids	IV.	Diastase

Choose the correct answer from the options given below:

**Options :**

71550511909. A-I, B-II, C-IV, D-III

71550511910. A-III, B-I, C-IV, D-II

71550511911. A-III, B-I, C-II, D-IV

71550511912. A-I, B-IV, C-III, D-II

**Question Number : 63 Question Id : 7155053744 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

सूची I को II से सुमेलित करें।

सूची I - एन्जाइम अभिक्रिया		सूची II - एन्जाइम	
A.	सुक्रोस → ग्लूकोस और फ्रक्टोस	I.	जाइमेस
B.	ग्लूकोस → एथिल ऐल्कोहोल CO <sub>2</sub>	II.	पेप्सिन
C.	स्टार्च → माल्टोस	III.	इन्वर्टेस
D.	प्रोटीन → अमीनो अम्ल	IV.	डायस्टेस

नीचे दिये गये विकल्पों में से सही उत्तर को चुने:

**Options :**

71550511909. A-I, B-II, C-IV, D-III

71550511910. A-III, B-I, C-IV, D-II

71550511911. A-III, B-I, C-II, D-IV

71550511912. A-I, B-IV, C-III, D-II

**Question Number : 64 Question Id : 7155053745 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The difference between electron gain enthalpies will be maximum between:

**Options :**

71550511913. Ne and F

71550511914. Ne and Cl

71550511915. Ar and F

71550511916. Ar and Cl

**Question Number : 64 Question Id : 7155053745 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

इलेक्ट्रान लाब्धि एन्थैल्पी का अन्तर अधिकतम होगा :

**Options :**

71550511913. Ne और F के बीच में

71550511914. Ne और Cl के बीच में

71550511915. Ar और F के बीच में

71550511916. Ar और Cl के बीच में

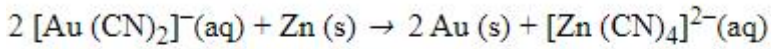
**Question Number : 65 Question Id : 7155053746 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Which of the following options are correct for the reaction



- A. Redox reaction
- B. Displacement reaction
- C. Decomposition reaction
- D. Combination reaction

Choose the correct answer from the options given below:

**Options :**

71550511917. A and B only

71550511918. A only

71550511919. C and D only

71550511920. A and D only

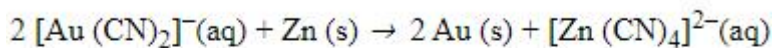
**Question Number : 65 Question Id : 7155053746 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

दी गई अभिक्रिया के लिये कौन सा विकल्प सही है:



- A. अपचयोपचय अभिक्रिया
- B. विस्थापन अभिक्रिया
- C. अपघटना अभिक्रिया
- D. योगात्मक अभिक्रिया

नीचे दिये गये विकल्पों में से सही उत्तर को चुनें:

**Options :**

71550511917. केवल A और B

71550511918. केवल A

71550511919. केवल C और D

71550511920. केवल A और D

**Question Number : 66 Question Id : 7155053747 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements, one is labelled as **Assertion A** and the other is labelled as **Reason R**.

**Assertion A** : Loss of electron from hydrogen atom results in nucleus of  $\sim 1.5 \times 10^{-3}$  pm size.

**Reason R** : Proton ( $H^+$ ) always exists in combined form.

In the light of the above statements, choose the most appropriate answer from the options given below:

**Options :**

71550511921. Both A and R are correct and R is the correct explanation of A

71550511922. Both A and R are correct but R is NOT the correct explanation of A

71550511923. A is correct but R is not correct

71550511924. A is not correct but R is correct

**Question Number : 66 Question Id : 7155053747 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements, one is labelled as **Assertion A** and the other is labelled as **Reason R**.

**अभिकथन A :** हाइड्रोजन परमाणु से इलेक्ट्रॉन के निकलने से  $\sim 1.5 \times 10^{-3}$  pm आकार का केन्द्रक हो जाता है।

**कारण R :** प्रोटॉन ( $H^+$ ) हमेशा संयुक्त रूप में रहता है।

उपरोक्त कथनों के संदर्भ में नीचे दिये गये विकल्पों में से सबसे उचित उत्तर को चुनें:

**Options :**

71550511921. A और R दोनों सत्य हैं और R, A की सही व्याख्या है।

71550511922. A और R दोनों सत्य है और R, A की सही व्याख्या नहीं है।

71550511923. A सत्य परन्तु R असत्य है।

71550511924. A असत्य परन्तु R सत्य है।

**Question Number : 67 Question Id : 7155053748 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The standard electrode potential of  $M^+/M$  in aqueous solution does not depend on

**Options :**

71550511925. Sublimation of a solid metal

71550511926. Ionisation of a gaseous metal atom

71550511927. Ionisation of a solid metal atom

71550511928. Hydration of a gaseous metal ion

**Question Number : 67 Question Id : 7155053748 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

मानक अपचयन विभव  $M^+/M$  जो कि अपचयन क्षमता की माप होती है निर्भर नहीं करती है

**Options :**

71550511925. ऊर्ध्वपातन ऊर्जा

71550511926. आयनीकरण ऊर्जा

71550511927. आबन्ध वियोजन एन्थैल्पी

71550511928. जलयोजन एन्थैल्पी

**Question Number : 68 Question Id : 7155053749 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The setting time of Cement is increased by adding

**Options :**

71550511929. Limestone

71550511930. Clay

71550511931. Gypsum

71550511932. Silica

**Question Number : 68 Question Id : 7155053749 Question Type : MCQ Option Shuffling : Yes Is**



**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

सीमेन्ट के जमने के समय को बढ़ाया जा सकता है \_\_\_\_\_ डालकर

**Options :**

71550511929. चूना पत्थर

71550511930. चिकनी मिट्टी

71550511931. जिप्सम

71550511932. सिलिका

**Question Number : 69 Question Id : 7155053750 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Match List I with List II

LIST I		LIST II	
Oxide		Type of bond	
A.	$N_2O_4$	I.	1 N = O bond
B.	$NO_2$	II.	1 N - O - N bond
C.	$N_2O_5$	III.	1 N - N bond
D.	$N_2O$	IV.	1 N=N / N $\equiv$ N bond

Choose the correct answer from the options given below:

**Options :**

71550511933. A-III, B-I, C-IV, D-II

71550511934. A-III, B-I, C-II, D-IV

71550511935. A-II, B-IV, C-III, D-I

71550511936. A-II, B-I, C-III, D-IV

**Question Number : 69 Question Id : 7155053750 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

सूची I को सूची II सुमेलित करें।

सूची I	सूची II
ऑक्साइड	आबंध का प्रकार
A. $N_2O_4$	I. 1 N = O आबंध
B. $NO_2$	II. 1 N - O - N आबंध
C. $N_2O_5$	III. 1 N - N आबंध
D. $N_2O$	IV. 1 N=N / N $\equiv$ N आबंध

नीचे दिये गये विकल्पों में से सही उत्तर को चुनें:

**Options :**

71550511933. A-III, B-I, C-IV, D-II

71550511934. A-III, B-I, C-II, D-IV

71550511935. A-II, B-IV, C-III, D-I

71550511936. A-II, B-I, C-III, D-IV

**Question Number : 70 Question Id : 7155053751 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Strong reducing and oxidizing agents among the following, respectively, are

**Options :**

71550511937.  $\text{Ce}^{4+}$  and  $\text{Eu}^{2+}$

71550511938.  $\text{Eu}^{2+}$  and  $\text{Ce}^{4+}$

71550511939.  $\text{Ce}^{3+}$  and  $\text{Ce}^{4+}$

71550511940.  $\text{Ce}^{4+}$  and  $\text{Tb}^{4+}$

**Question Number : 70 Question Id : 7155053751 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

निम्नलिखित में क्रमशः प्रबल अपचायक और आवसीकारक है।

**Options :**

71550511937.  $\text{Ce}^{4+}$  और  $\text{Eu}^{2+}$

71550511938.  $\text{Eu}^{2+}$  और  $\text{Ce}^{4+}$

71550511939.  $\text{Ce}^{3+}$  और  $\text{Ce}^{4+}$

71550511940.  $\text{Ce}^{4+}$  और  $\text{Tb}^{4+}$

**Question Number : 71 Question Id : 7155053752 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The possibility of photochemical smog formation is more at

**Options :**

71550511941. The places with healthy vegetation

71550511942. Industrial areas

71550511943. Himalayan villages in winter

71550511944. Marshy lands

**Question Number : 71 Question Id : 7155053752 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

प्रकाशरसायन धूम की सम्भावना अधिकतम होती है:

**Options :**

71550511941. धनी वनस्पति वाले जगहों पर

71550511942. औद्योगिक क्षेत्रों में

71550511943. ठण्ड में हिमालयी गावों में

71550511944. दलदली भूमि पर

**Question Number : 72 Question Id : 7155053753 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements, one is labelled as **Assertion A** and the other is labelled as **Reason R**.

**Assertion A:** The spin only magnetic moment value for  $[\text{Fe}(\text{CN})_6]^{3-}$  is 1.74 BM, whereas for  $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$  is 5.92 BM.

**Reason R :** In both complexes, Fe is present in +3 oxidation state.

In the light of the above statements, choose the correct answer from the options given below:

**Options :**

71550511945. Both A and R are true and R is the correct explanation of A

71550511946. Both A and R are true but R is NOT the correct explanation of A

71550511947. A is true but R is false

71550511948. A is false but R is true

**Question Number : 72 Question Id : 7155053753 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Given below are two statements, one is labelled as **Assertion A** and the other is labelled as **Reason R**.

**अभिकथन A:**  $[\text{Fe}(\text{CN})_6]^{3-}$  के केवल प्रचक्रण चुंबकीय आघूर्ण का मान 1.74 BM है जबकि  $[\text{Fe}(\text{H}_2\text{O})_6]^{3+}$  5.92 BM है।

**कारण R :** दोनों संकुलों में आयरन +3 आवसीकरण अवस्था में है।

उपरोक्त कथनों के सन्दर्भ में नीचे दिये गये विकल्पों से सहीस उत्तर को चुनें।

**Options :**

71550511945. A और R दोनों सत्य है और R, A की सही व्याख्या है

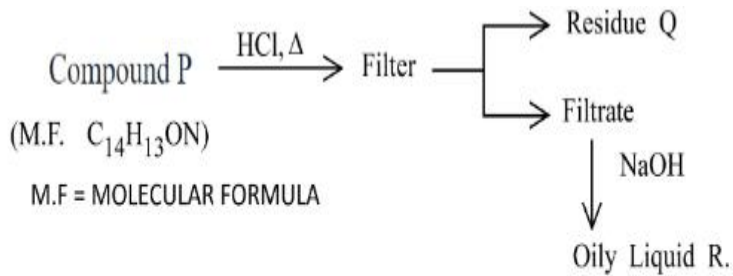
71550511946. A और R दोनों सत्य है और R, A की सही व्याख्या नहीं है

71550511947. A सत्य परन्तु R असत्य है

71550511948. A असत्य परन्तु R सत्य है

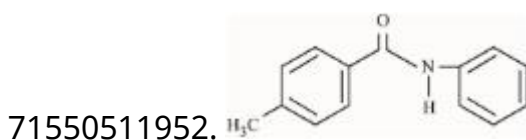
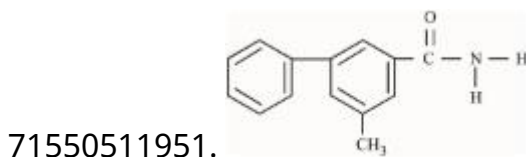
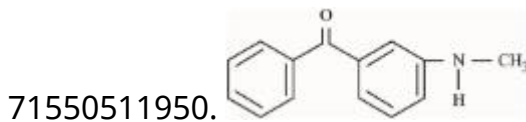
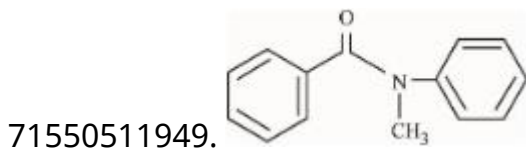
**Question Number : 73 Question Id : 7155053754 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**



Compound P is neutral, Q gives effervescence with  $\text{NaHCO}_3$  while R reacts with Hinsbergs reagent to give solid soluble in NaOH. Compound P is

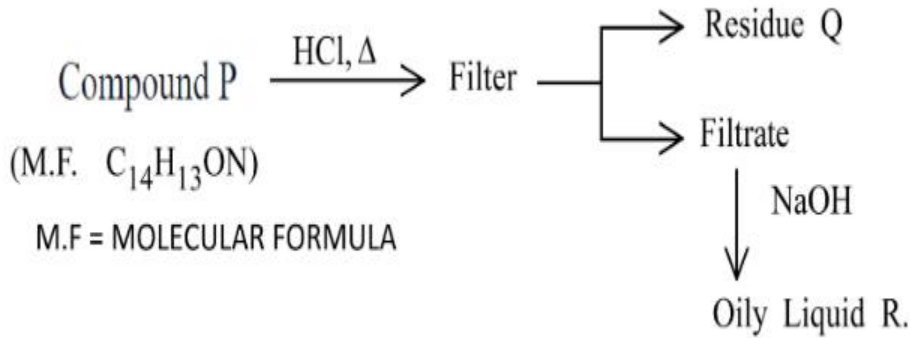
**Options :**



Question Number : 73 Question Id : 7155053754 Question Type : MCQ Option Shuffling : Yes Is  
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum  
Instruction Time : 0

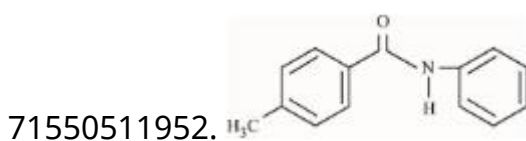
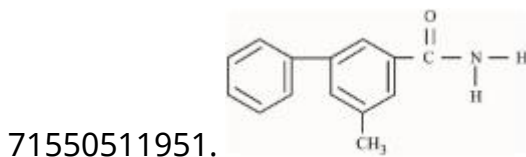
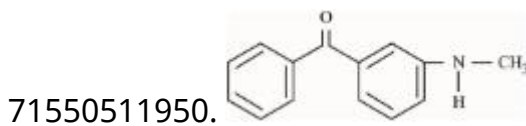
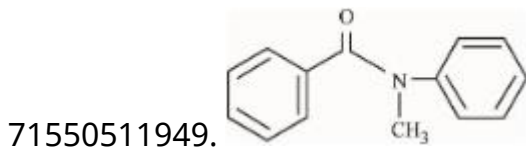
Correct Marks : 4 Wrong Marks : 1

यौगिक P



यौगिक P उदासीन है, Q  $\text{NaHCO}_3$  के साथ प्रबुद्बुदन देता है जबकि R हिन्सबर्ग अभिकर्मक से अभिक्रिया करने पर  $\text{NaOH}$  घुलनशील ठोस देता है। यौगिक P है:

Options :



Question Number : 74 Question Id : 7155053755 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Match List I with List II

LIST I		LIST II	
Element detected		Reagent used / Product formed	
A.	Nitrogen	I.	$\text{Na}_2[\text{Fe}(\text{CN})_5 \text{NO}]$
B.	Sulphur	II.	$\text{AgNO}_3$
C.	Phosphorous	III.	$\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$
D.	Halogen	IV.	$(\text{NH}_4)_2 \text{MoO}_4$

Choose the correct answer from the options given below:

Options :

71550511953. A-II, B-I, C-IV, D-III

71550511954. A-III, B-I, C-IV, D-II

71550511955. A-II, B-IV, C-I, D-III

71550511956. A-IV, B-II, C-I, D-III

Question Number : 74 Question Id : 7155053755 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

सूची- I को सूची- II से सुमेलित करें।

सूची I		सूची II	
प्राप्त तत्व		प्रयुक्त अभिकर्मक / प्राप्त उत्पाद	
A.	नाइट्रोजन	I.	$\text{Na}_2[\text{Fe}(\text{CN})_5 \text{NO}]$
B.	सल्फर	II.	$\text{AgNO}_3$
C.	फॉस्फोरस	III.	$\text{Fe}_4[\text{Fe}(\text{CN})_6]_3$
D.	हैलोजन	IV.	$(\text{NH}_4)_2 \text{MoO}_4$

नीचे दिये गये विकल्पों में से सही उत्तर को चुनें:



**Options :**

71550511953. A-II, B-I, C-IV, D-III

71550511954. A-III, B-I, C-IV, D-II

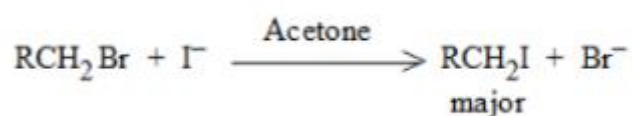
71550511955. A-II, B-IV, C-I, D-III

71550511956. A-IV, B-II, C-I, D-III

**Question Number : 75 Question Id : 7155053756 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

For the reaction



The correct statement is

**Options :**

71550511957. The reaction can occur in acetic acid also.

71550511958.  $\text{Br}^-$  can act as competing nucleophile.

71550511959. The solvent used in the reaction solvates the ions formed in rate determining step.

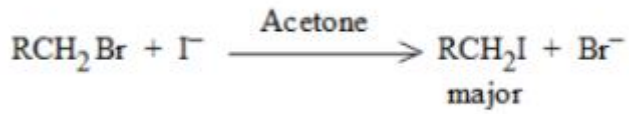
71550511960. The transition state formed in the above reaction is less polar than the localised anion.

**Question Number : 75 Question Id : 7155053756 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

दी गई अभिक्रिया के लिये



सत्य कथन है:

**Options :**

71550511957. ऐसिटिक अम्ल में भी अभिक्रिया हो सकती है।

71550511958.  $\text{Br}^-$  स्पर्धात्मक नाभिकस्रेही की तरह कार्य कर सकता है।

71550511959. अभिक्रिया में उपयोग किया गया विलायक वेग निर्धारण क्रम में बने आयनों को विद्राविक कर देता है।

71550511960. ऊपर दी गई अभिक्रिया में बनी संक्रमण अवस्था स्थानासीमित ऋणायनों से कम ध्रुवीय होती है।

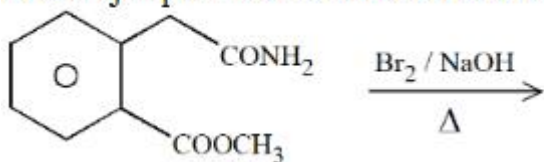
**Question Number : 76 Question Id : 7155053757 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

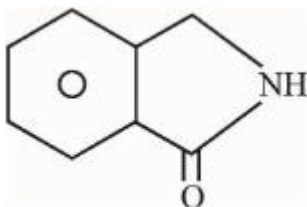
**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The major product formed in the following reaction is

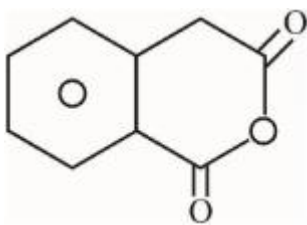


**Options :**

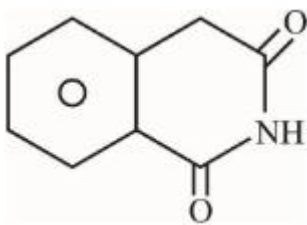


71550511961.

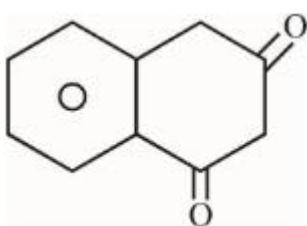
71550511962.



71550511963.



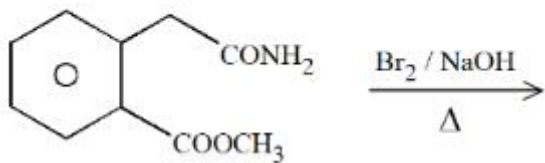
71550511964.



**Question Number : 76 Question Id : 7155053757 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

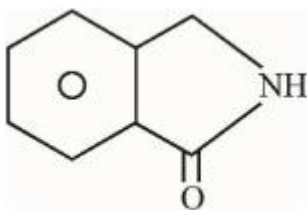
**Correct Marks : 4 Wrong Marks : 1**

दी गई अभिक्रिया में बना प्रमुख उत्पाद है:

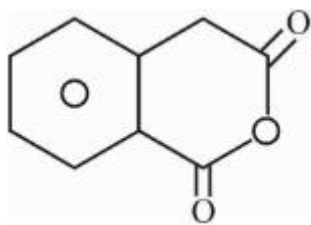


**Options :**

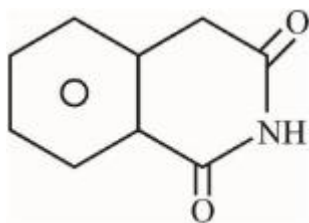
71550511961.



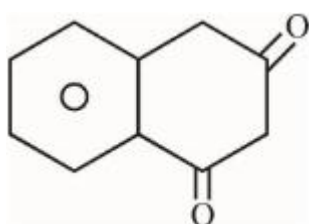
71550511962.



71550511963.



71550511964.



**Question Number : 77 Question Id : 7155053758 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Match List I with List II

LIST I		LIST II	
Name of reaction		Reagent used	
A.	Hell-Volhard-Zelinsky reaction	I.	NaOH + I <sub>2</sub>
B.	Iodoform reaction	II.	(i) CrO <sub>2</sub> Cl <sub>2</sub> , CS <sub>2</sub> (ii) H <sub>2</sub> O
C.	Etard reaction	III.	(i) Br <sub>2</sub> / red phosphorus (ii) H <sub>2</sub> O
D.	Gatterman-Koch reaction	IV.	CO, HCl, anhyd. AlCl <sub>3</sub>

Choose the correct answer from the options given below:

**Options :**

71550511965. A-I, B-II, C-III, D-IV

71550511966. A-III, B-II, C-I, D-IV

71550511967. A-III, B-I, C-II, D-IV

71550511968. A-III, B-I, C-IV, D-II

Question Number : 77 Question Id : 7155053758 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

सूची I को II से सुमेलिक करें:

सूची I	सूची II
अभिक्रिया का नाम	उपयोग किया गया अभिकर्मक
A. हिलवोलाई जेलिसकी अभिक्रिया	I. NaOH + I <sub>2</sub>
B. आयोडोफार्म अभिक्रिया	II. (i) CrO <sub>2</sub> Cl <sub>2</sub> , CS <sub>2</sub> (ii) H <sub>2</sub> O
C. ईटार्ड अभिक्रिया	III. (i) Br <sub>2</sub> / लाल फॉस्फोरस (ii) H <sub>2</sub> O
D. गाटरमान-काख अभिक्रिया	IV. CO, HCl, anhyd. AlCl <sub>3</sub>

नीचे दिये गये विकल्पों से सही उत्तर को चुनें:

Options :

71550511965. A-I, B-II, C-III, D-IV

71550511966. A-III, B-II, C-I, D-IV

71550511967. A-III, B-I, C-II, D-IV

71550511968. A-III, B-I, C-IV, D-II

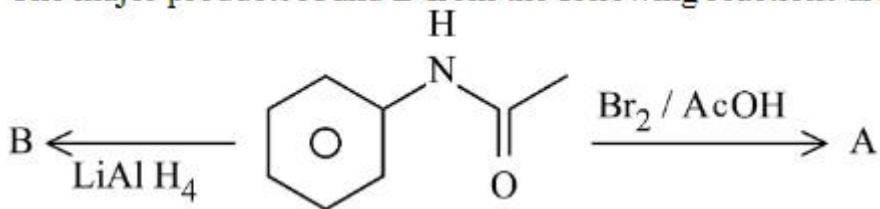
Question Number : 78 Question Id : 7155053759 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

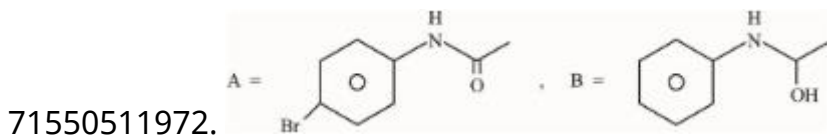
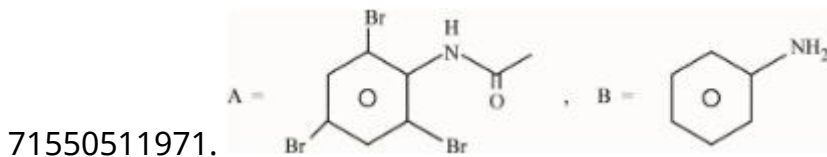
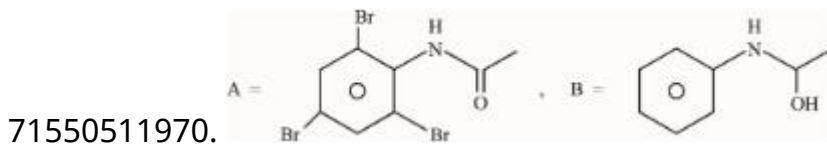
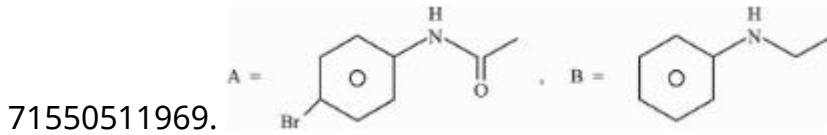
Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The major products A and B from the following reactions are:



Options :



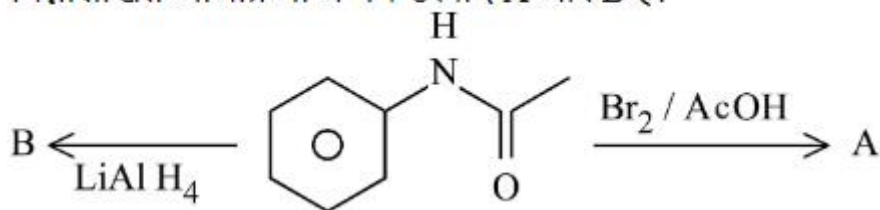
Question Number : 78 Question Id : 7155053759 Question Type : MCQ Option Shuffling : Yes Is

Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया में बने उत्पाद A और B है:

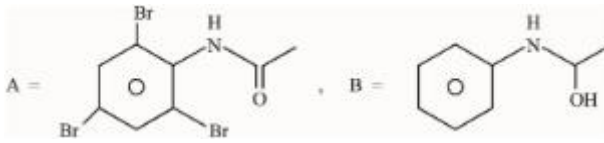


Options :

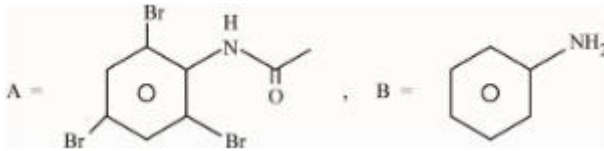
71550511969.



71550511970.



71550511971.



71550511972.



**Question Number : 79 Question Id : 7155053760 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Polymer used in orlon is:

**Options :**

71550511973. Polyacrylonitrile

71550511974. Polyamide

71550511975. Polyethene

71550511976. Polycarbonate

**Question Number : 79 Question Id : 7155053760 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

ऑरलॉन में प्रयोग किया जाने वाला बहुलक है:

**Options :**

71550511973. पॉलिएक्रिलोनाइट्राइल

71550511974. पॉलिएमाइड

71550511975. पॉलिथीन

71550511976. पॉलिकारबोनेट

**Question Number : 80 Question Id : 7155053761 Question Type : MCQ Option Shuffling : Yes Is**

**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Match List I with List II

LIST I		LIST II	
Vitamin		Deficiency disease	
A.	Vitamin A	I.	Beri-Beri
B.	Thiamine	II.	Cheilosis
C.	Ascorbic acid	III.	Xerophthalmia
D.	Riboflavin	IV.	Scurvy

Choose the correct answer from the options given below:

**Options :**

71550511977. A-IV, B-I, C-III, D-II

71550511978. A-III, B-I, C-IV, D-II

71550511979. A-III, B-II, C-IV, D-I



71550511980. A-IV, B-II, C-III, D-I

Question Number : 80 Question Id : 7155053761 Question Type : MCQ Option Shuffling : Yes Is  
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum  
Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

सूची I को सूची II से सुमेलित करें

सूची I	सूची II
विटामीन	हीनता जनित रोग
A. विटामीन A	I. बेरी-बेरी
B. थायमीन	II. कीलोसिस
C. ऐस्कार्बिक अम्ल	III. जिअरापथैल्मिया
D. राइबोफ्लेविन	IV. स्कर्वी

नीचे दिये गये विकल्पों से सही उत्तर को चुनें:

Options :

71550511977. A-IV, B-I, C-III, D-II

71550511978. A-III, B-I, C-IV, D-II

71550511979. A-III, B-II, C-IV, D-I

71550511980. A-IV, B-II, C-III, D-I

## Chemistry Section B

Section Id : 715505228

Section Number : 6

Section type : Online

<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	10
<b>Number of Questions to be attempted :</b>	5
<b>Section Marks :</b>	20
<b>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes
<b>Maximum Instruction Time :</b>	0
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	715505228
<b>Question Shuffling Allowed :</b>	Yes
<b>Is Section Default? :</b>	null

**Question Number : 81 Question Id : 7155053762 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

If 5 moles of  $\text{BaCl}_2$  is mixed with 2 moles of  $\text{Na}_3\text{PO}_4$ , the maximum number of moles of  $\text{Ba}_3(\text{PO}_4)_2$  formed is \_\_\_\_\_ (Nearest integer)

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

**Question Number : 81 Question Id : 7155053762 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

यदि  $\text{BaCl}_2$  के 5 मोल को 2 मोल  $\text{Na}_3\text{PO}_4$  से मिश्रित किया गया है तो  $\text{Ba}_3(\text{PO}_4)_2$  के बने अधिकतम मोलों की संख्या \_\_\_\_\_ है। (निकततम पूर्णांक)

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

**Question Number : 82 Question Id : 7155053763 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

The wavelength of an electron of kinetic energy  $4.50 \times 10^{-29}$  J is \_\_\_\_\_  $\times 10^{-5}$  m. (Nearest integer)

Given : mass of electron is  $9 \times 10^{-31}$  kg,  $h = 6.6 \times 10^{-34}$  J s

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

**Question Number : 82 Question Id : 7155053763 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

$4.50 \times 10^{-29}$  J गतिज ऊर्जा वाले इलेक्ट्रॉन की तरंग-दैर्घ्य \_\_\_\_\_  $\times 10^{-5}$  m है। (निकटतम पूर्णांक)

दिया गया है : इलेक्ट्रॉन का द्रव्यमान  $9 \times 10^{-31}$  kg,  $h = 6.6 \times 10^{-34}$  J s

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

Question Number : 83 Question Id : 7155053764 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The number of species from the following which have square pyramidal structure is \_\_\_\_\_

$\text{PF}_5$ ,  $\text{BrF}_4^-$ ,  $\text{IF}_5$ ,  $\text{BrF}_5$ ,  $\text{XeOF}_4$ ,  $\text{ICl}_4^-$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Question Number : 83 Question Id : 7155053764 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित में से वर्ग पिरामिडी संरचना वाले जातियों की संख्या \_\_\_\_\_ है।

$\text{PF}_5$ ,  $\text{BrF}_4^-$ ,  $\text{IF}_5$ ,  $\text{BrF}_5$ ,  $\text{XeOF}_4$ ,  $\text{ICl}_4^-$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Question Number : 84 Question Id : 7155053765 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The value of  $\log K$  for the reaction  $A \rightleftharpoons B$  at 298 K is \_\_\_\_\_. (Nearest integer)

Given:  $\Delta H^\circ = -54.07 \text{ kJ mol}^{-1}$

$\Delta S^\circ = 10 \text{ J K}^{-1} \text{ mol}^{-1}$

(Take  $2.303 \times 8.314 \times 298 = 5705$ )

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 84 **Question Id :** 7155053765 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

298 K ताप पर अभिक्रिया  $A \rightleftharpoons B$  के लिए  $\log K$  का मान \_\_\_\_\_ है। (Nearest integer)

दिया गया है:  $\Delta H^\circ = -54.07 \text{ kJ mol}^{-1}$

$\Delta S^\circ = 10 \text{ J K}^{-1} \text{ mol}^{-1}$

( $2.303 \times 8.314 \times 298 = 5705$  लें)

(निकटतम पूर्णांक)

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 85 **Question Id :** 7155053766 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

Mass of Urea ( $\text{NH}_2\text{CONH}_2$ ) required to be dissolved in 1000 g of water in order to reduce the vapour pressure of water by 25% is \_\_\_\_\_ g. (Nearest integer)

Given: Molar mass of N, C, O and H are 14, 12, 16 and  $1 \text{ g mol}^{-1}$  respectively.

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 85 **Question Id :** 7155053766 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

वाष्प दाब को 25% कम करने के लिए 1000 g पानी में घोलने के लिए यूरिया ( $\text{NH}_2\text{CONH}_2$ ) का आवश्यक द्रव्यमान \_\_\_\_\_ g है। (निकटतम पूर्णांक)

दिया गया है: N, C, O और H के मोलर द्रव्यमान क्रमशः 14, 12, 16 और  $1 \text{ g mol}^{-1}$  हैं।

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

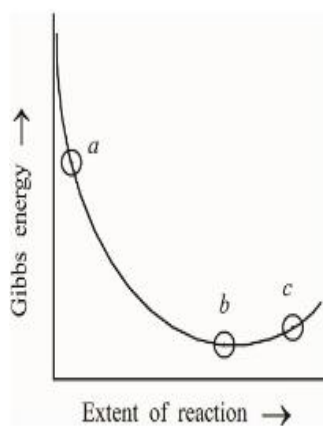
10

**Question Number :** 86 **Question Id :** 7155053767 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

Consider the graph of Gibbs free energy  $G$  vs Extent of reaction. The number of statement/s from the following which are true with respect to points (a), (b) and (c) is \_\_\_\_\_



- A. Reaction is spontaneous at (a) and (b)
- B. Reaction is at equilibrium at point (b) and non-spontaneous at point (c)
- C. Reaction is spontaneous at (a) and non-spontaneous at (c)
- D. Reaction is non-spontaneous at (a) and (b)

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

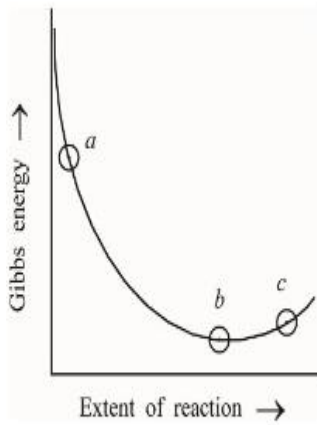
10

**Question Number :** 86 **Question Id :** 7155053767 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

गिब्स मुक्त ऊर्जा और अभिक्रिया के विस्तार के बीच आलेख को ध्यान से देखें। बिन्दु (a), (b) और (c) के अनुसार निम्नलिखित में से सत्य कथन \_\_\_\_\_ हैं।



- A. बिन्दु (a) और (b) पर अभिक्रिया स्वतः प्रवर्तित है
- B. बिन्दु (b) पर अभिक्रिया साम्यावस्था में है और बिन्दु (c) पर अस्वतः प्रवर्तित है
- C. बिन्दु (a) पर अभिक्रिया स्वतः प्रवर्तित है और बिन्दु (c) पर अस्वतः प्रवर्तित है
- D. बिन्दु (a) और (b) पर अभिक्रिया अस्वतः प्रवर्तित है

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 87 **Question Id :** 7155053768 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

For the adsorption of hydrogen on platinum, the activation energy is  $30 \text{ kJ mol}^{-1}$  and for the adsorption of hydrogen on nickel, the activation energy is  $41.4 \text{ kJ mol}^{-1}$ . The logarithm of the ratio of the rates of chemisorption on equal areas of the metals at 300 K is \_\_\_\_\_ (Nearest integer)

Given:  $\ln 10 = 2.3$

$$R = 8.3 \text{ J K}^{-1} \text{ mol}^{-1}$$

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText



**Possible Answers :**

10

**Question Number : 87 Question Id : 7155053768 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

प्लेटिनम सतह पर हाइड्रोजन के अधिशोषण के लिए संक्रियण ऊर्जा  $30 \text{ kJ mol}^{-1}$  है और निकेल सतह पर हाइड्रोजन के अधिशोषण की सक्रियण ऊर्जा  $41.4 \text{ kJ mol}^{-1}$  है। 300 K ताप पर धातुओं के समान क्षेत्रफल पर रसोवशोषण की दर के अनुपात का लघुगणक \_\_\_\_\_ है। (निकटतम पूर्णांक)

दिया गया है:  $\ln 10 = 2.3$

$$R = 8.3 \text{ J K}^{-1} \text{ mol}^{-1}$$

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

**Question Number : 88 Question Id : 7155053769 Question Type : SA Calculator : None**

**Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

**Correct Marks : 4 Wrong Marks : 1**

Number of ambidentate ligands in a representative metal complex  $[\text{M(en)(SCN)}_4]$  is \_\_\_\_\_.

[en = ethylenediamine]

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

Question Number : 88 Question Id : 7155053769 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

दिये गये धातु संकुल  $[M(en)(SCN)_4]$  में उभयदेती लिगण्ड की संख्या \_\_\_\_\_ है। [en = ethylenediamine]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Question Number : 89 Question Id : 7155053770 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Number of bromo derivatives obtained on treating ethane with excess of  $Br_2$  in diffused sunlight is \_\_\_\_\_

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

Question Number : 89 Question Id : 7155053770 Question Type : SA Calculator : None

Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

विसरित सूर्यप्रकाश में एथेन को  $Br_2$  के आधिक्य में अभिक्रिया कराने पर ब्रोमो व्युत्पन्नो की संख्या \_\_\_\_\_ है।

Response Type : Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 90 **Question Id :** 7155053771 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

In ammonium – phosphomolybdate, the oxidation state of Mo is + \_\_\_\_\_

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 90 **Question Id :** 7155053771 **Question Type :** SA **Calculator :** None

**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

**Correct Marks :** 4 **Wrong Marks :** 1

आमोनियम- फॉस्फोमालिब्डेट में Mo की ऑक्सीकरण अवस्था + \_\_\_\_\_ है।

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10