

# National Testing Agency

|                              |                     |
|------------------------------|---------------------|
| <b>Question Paper Name :</b> | SET 144             |
| <b>Subject Name :</b>        | B TECH              |
| <b>Creation Date :</b>       | 2023-04-08 20:34:29 |
| <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>                    | 71550547  |
| <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>     | 715505259 |
| <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>   | 715505259 |
| <b>Question Shuffling Allowed :</b>                                 | Yes       |
| <b>Is Section Default? :</b>  | null      |

**Question Number : 1 Question Id : 7155054222 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  $A = \{1, 2, 3, 4, 5, 6, 7\}$ . Then the relation  $R = \{(x, y) \in A \times A : x + y = 7\}$  is

**Options :**

71550513341. reflexive but neither symmetric nor transitive

71550513342. symmetric but neither reflexive nor transitive

71550513343. transitive but neither symmetric nor reflexive

71550513344. an equivalence relation

**Question Number : 1 Question Id : 7155054222 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  $A = \{1, 2, 3, 4, 5, 6, 7\}$  है। तो संबंध  $R = \{(x, y) \in A \times A : x + y = 7\}$

**Options :**

71550513341. स्वतुल्य है परन्तु न तो सममित है न ही संक्रामक है

71550513342. सममित है परन्तु न तो स्वतुल्य है न ही संक्रामक है

71550513343. संक्रामक है परन्तु न तो स्वतुल्य है न ही सममित है

71550513344. एक तुल्यता संबंध है

**Question Number : 2 Question Id : 7155054223 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  $A = \left\{ \theta \in (0, 2\pi) : \frac{1+2i\sin\theta}{1-i\sin\theta} \text{ is purely imaginary} \right\}$ . Then the sum of the elements in  $A$  is

**Options :**

71550513345.  $2\pi$

71550513346.  $3\pi$

71550513347.  $4\pi$

71550513348.  $\pi$

**Question Number : 2 Question Id : 7155054223 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  $A = \left\{ \theta \in (0, 2\pi) : \frac{1+2i\sin\theta}{1-i\sin\theta} \text{ मात्र काल्पनिक है} \right\}$  । तो A में अवयवों का योग है:

**Options :**

71550513345.  $2\pi$

71550513346.  $3\pi$

71550513347.  $4\pi$

71550513348.  $\pi$

**Question Number : 3 Question Id : 7155054224 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 S be the set of all values of  $\theta \in [-\pi, \pi]$  for which the system of linear equations

$$x + y + \sqrt{3}z = 0$$

$$-x + (\tan\theta)y + \sqrt{7}z = 0$$

$$x + y + (\tan\theta)z = 0$$

has non-trivial solution. Then  $\frac{120}{\pi} \sum_{\theta \in S} \theta$  is equal to

**Options :**

71550513349. 10

71550513350. 20

71550513351. 30

71550513352. 40

Question Number : 3 Question Id : 7155054224 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  $\theta \in [-\pi, \pi]$  के सभी मानों, जिनके लिए रैखिक समीकरण निकाय

$$x + y + \sqrt{3}z = 0$$

$$-x + (\tan \theta)y + \sqrt{7}z = 0$$

$$x + y + (\tan \theta)z = 0$$

का अतुच्छ हल है, का समुच्चय S है। तो  $\frac{120}{\pi} \sum_{\theta \in S} \theta$  बराबर है

Options :

71550513349. 10

71550513350. 20

71550513351. 30

71550513352. 40

Question Number : 4 Question Id : 7155054225 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  $A = \begin{bmatrix} 1 & 5 \\ \lambda & 10 \end{bmatrix}$ ,  $A^{-1} = \alpha A + \beta I$  and  $\alpha + \beta = -2$ , then  $4\alpha^2 + \beta^2 + \lambda^2$  is equal to :

Options :

71550513353. 10

71550513354. 12

71550513355. 14

71550513356. 19

**Question Number : 4 Question Id : 7155054225 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  $A = \begin{bmatrix} 1 & 5 \\ \lambda & 10 \end{bmatrix}$ ,  $A^{-1} = \alpha A + \beta I$  तथा  $\alpha + \beta = -2$  हैं, तो  $4\alpha^2 + \beta^2 + \lambda^2$  बराबर है:

**Options :**

71550513353. 10

71550513354. 12

71550513355. 14

71550513356. 19

**Question Number : 5 Question Id : 7155054226 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 number of words, with or without meaning, which can be made using all the letters of the word MATHEMATICS in which C and S do not come together, is  $(6!)k$ , then k is equal to

**Options :**

71550513357. 945

71550513358. 1890

71550513359. 2835

71550513360. 5670

**Question Number : 5 Question Id : 7155054226 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 शब्द MATHEMATICS के सभी अक्षरों के प्रयोग से बनाए जा सकने वाले, अर्थपूर्ण या अर्थहीन शब्दों, जिनमें C तथा S एक साथ न हो, की संख्या  $(6!)^k$  है, तो k बराबर है -

**Options :**

71550513357. 945

71550513358. 1890

71550513359. 2835

71550513360. 5670

**Question Number : 6 Question Id : 7155054227 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**

$25^{190} - 19^{190} - 8^{190} + 2^{190}$  is divisible by

**Options :**

71550513361. both 14 and 34

71550513362. 14 but not by 34

71550513363. 34 but not by 14

71550513364. neither 14 nor 34

**Question Number : 6 Question Id : 7155054227 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**

$$25^{190} - 19^{190} - 8^{190} + 2^{190}$$

**Options :**

71550513361. 14 तथा 34 दोनों से विभाज्य है

71550513362. 14 से विभाज्य है परन्तु 34 से नहीं

71550513363. 34 से विभाज्य है परन्तु 14 से नहीं

71550513364. न तो 14 से न ही 34 से विभाज्य है

**Question Number : 7 Question Id : 7155054228 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 absolute difference of the coefficients of  $x^{10}$  and  $x^7$  in the expansion of  $\left(2x^2 + \frac{1}{2x}\right)^{11}$  is equal to

**Options :**

71550513365.  $11^3 - 11$

71550513366.  $12^3 - 12$



$$71550513367. 10^3 - 10$$

$$71550513368. 13^3 - 13$$

**Question Number : 7 Question Id : 7155054228 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**

$\left(2x^2 + \frac{1}{2x}\right)^{11}$  के प्रसार में  $x^{10}$  तथा  $x^7$  के गुणांको का निरपेक्ष अंतर बराबर है

**Options :**

$$71550513365. 11^3 - 11$$

$$71550513366. 12^3 - 12$$

$$71550513367. 10^3 - 10$$

$$71550513368. 13^3 - 13$$

**Question Number : 8 Question Id : 7155054229 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  $a_n$  be the  $n^{\text{th}}$  term of the series  $5 + 8 + 14 + 23 + 35 + 50 + \dots$  and  $S_n = \sum_{k=1}^n a_k$ . Then  $S_{30} - a_{40}$  is equal to

**Options :**

$$71550513369. 11260$$

71550513370. 11280

71550513371. 11290

71550513372. 11310

**Question Number : 8 Question Id : 7155054229 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 श्रेणी  $5 + 8 + 14 + 23 + 35 + 50 + \dots$  का  $n$ वाँ पद  $a_n$  है तथा  $S_n = \sum_{k=1}^n a_k$  है।

तो  $S_{30} - a_{40}$  बराबर है

**Options :**

71550513369. 11260

71550513370. 11280

71550513371. 11290

71550513372. 11310

**Question Number : 9 Question Id : 7155054230 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  $\alpha > \beta > 0$  are the roots of the equation  $ax^2 + bx + 1 = 0$ , and

$\lim_{x \rightarrow \frac{1}{\alpha}} \left( \frac{1 - \cos(x^2 + bx + a)}{2(1 - \alpha x)^2} \right)^{\frac{1}{2}} = \frac{1}{k} \left( \frac{1}{\beta} - \frac{1}{\alpha} \right)$ , then  $k$  is equal to

**Options :**

71550513373.  $\alpha$

71550513374.  $\beta$

71550513375.  $2\alpha$

71550513376.  $2\beta$

**Question Number : 9 Question Id : 7155054230 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  $ax^2 + bx + 1 = 0$  के मूल  $\alpha > \beta > 0$  हैं तथा

$$\lim_{x \rightarrow \frac{1}{\alpha}} \left( \frac{1 - \cos(x^2 + bx + a)}{2(1 - \alpha x)^2} \right)^{\frac{1}{2}} = \frac{1}{k} \left( \frac{1}{\beta} - \frac{1}{\alpha} \right) \text{ है, तो } k \text{ बराबर है:}$$

**Options :**

71550513373.  $\alpha$

71550513374.  $\beta$

71550513375.  $2\alpha$

71550513376.  $2\beta$

**Question Number : 10 Question Id : 7155054231 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 integral  $\int \left( \left( \frac{x}{2} \right)^x + \left( \frac{2}{x} \right)^x \right) \log_2 x \, dx$  is equal to

**Options :**

71550513377.  $\left( \frac{x}{2} \right)^x + \left( \frac{2}{x} \right)^x + C$

71550513378.  $\left( \frac{x}{2} \right)^x - \left( \frac{2}{x} \right)^x + C$

71550513379.  $\left( \frac{x}{2} \right)^x \log_2 \left( \frac{x}{2} \right) + C$

71550513380.  $\left( \frac{x}{2} \right)^x \log_2 \left( \frac{2}{x} \right) + C$

**Question Number : 10 Question Id : 7155054231 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**

समाकलन  $\int \left( \left( \frac{x}{2} \right)^x + \left( \frac{2}{x} \right)^x \right) \log_2 x \, dx$  बराबर है:

**Options :**

71550513377.  $\left( \frac{x}{2} \right)^x + \left( \frac{2}{x} \right)^x + C$

71550513378.  $\left( \frac{x}{2} \right)^x - \left( \frac{2}{x} \right)^x + C$

71550513379.  $\left( \frac{x}{2} \right)^x \log_2 \left( \frac{x}{2} \right) + C$

71550513380.  $\left(\frac{x}{2}\right)^x \log_2 \left(\frac{2}{x}\right) + C$

**Question Number : 11 Question Id : 7155054232 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 O be the origin and OP and OQ be the tangents to the circle  $x^2 + y^2 - 6x + 4y + 8 = 0$  at the points P and Q on it. If the circumcircle of the triangle OPQ passes through the point  $\left(\alpha, \frac{1}{2}\right)$ , then a value of  $\alpha$  is

**Options :**

71550513381.  $-\frac{1}{2}$

71550513382. 1

71550513383.  $\frac{3}{2}$

71550513384.  $\frac{5}{2}$

**Question Number : 11 Question Id : 7155054232 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 O मूल बिंदु है तथा OP और OQ वृत्त  $x^2 + y^2 - 6x + 4y + 8 = 0$  के बिंदुओं P तथा Q पर स्पर्श रेखाएँ हैं। यदि त्रिभुज OPQ का परिवृत्त, बिंदु  $\left(\alpha, \frac{1}{2}\right)$  से होकर जाता है, तो  $\alpha$  का एक मान है:

**Options :**

71550513381.  $-\frac{1}{2}$

71550513382. 1

71550513383.  $\frac{3}{2}$

71550513384.  $\frac{5}{2}$

**Question Number : 12 Question Id : 7155054233 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 (0, 1), B(1, 1) and C (1, 0) be the mid-points of the sides of a triangle with incentre at the point D. If the focus of the parabola  $y^2 = 4ax$  passing through D is  $(\alpha + \beta\sqrt{2}, 0)$ , where  $\alpha$  and  $\beta$  are rational numbers, then  $\frac{\alpha}{\beta^2}$  is equal to

**Options :**

71550513385.  $\frac{9}{2}$

71550513386. 6

71550513387. 8

71550513388. 12

**Question Number : 12 Question Id : 7155054233 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 एक त्रिभुज की भुजाओं के मध्य बिंदु A (0, 1), B(1, 1) तथा C (1, 0) हैं तथा इसका अंतःकेन्द्र बिंदु D पर है। यदि D से होकर जाने वाले परवलय  $y^2 = 4ax$  की नाभि  $(\alpha + \beta\sqrt{2}, 0)$  है, जहाँ  $\alpha$  तथा  $\beta$  परिमेय संख्याएँ हैं, तो  $\frac{\alpha}{\beta^2}$  बराबर है:

**Options :**

71550513385.  $\frac{9}{2}$

71550513386. 6

71550513387. 8

71550513388. 12

**Question Number : 13 Question Id : 7155054234 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 P be the plane passing through the line  $\frac{x-1}{1} = \frac{y-2}{-3} = \frac{z+5}{7}$  and the point (2, 4, -3). If the image of the point (-1, 3, 4) in the plane P is  $(\alpha, \beta, \gamma)$  then  $\alpha + \beta + \gamma$  is equal to

**Options :**

71550513389. 9

71550513390. 10

71550513391. 11

71550513392. 12

Question Number : 13 Question Id : 7155054234 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 बिंदु  $(2, 4, -3)$  तथा रेखा  $\frac{x-1}{1} = \frac{y-2}{-3} = \frac{z+5}{7}$  से होकर जाने वाला समतल P है।

यदि बिंदु  $(-1, 3, 4)$  का समतल P में प्रतिबिंब  $(\alpha, \beta, \gamma)$  है, तो  $\alpha + \beta + \gamma$  बराबर है:

Options :

71550513389. 9

71550513390. 10

71550513391. 11

71550513392. 12

Question Number : 14 Question Id : 7155054235 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  $a, b \in \mathbb{Z}$  and  $|a - b| \leq 10$ , let the angle between the plane P:  $ax + y - z = b$  and

the line  $l : x - 1 = a - y = z + 1$  be  $\cos^{-1}\left(\frac{1}{3}\right)$ . If the distance of the point

$(6, -6, 4)$  from the plane P is  $3\sqrt{6}$ , then  $a^4 + b^2$  is equal to

Options :

71550513393. 25

71550513394. 32

71550513395. 48

71550513396. 85



**Question Number : 14 Question Id : 7155054235 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**

$a, b \in \mathbb{Z}$  तथा  $|a - b| \leq 10$  के लिए, माना समतल P:  $ax + y - z = b$  तथा

रेखा  $l: x - 1 = a - y = z + 1$  के बीच का कोण  $\cos^{-1}\left(\frac{1}{3}\right)$  है। यदि बिंदु  $(6, -6, 4)$  की

समतल P से दूरी  $3\sqrt{6}$  है, तो  $a^4 + b^2$  बराबर है:

**Options :**

71550513393. 25

71550513394. 32

71550513395. 48

71550513396. 85

**Question Number : 15 Question Id : 7155054236 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 area of the quadrilateral ABCD with vertices

A  $(2, 1, 1)$ , B  $(1, 2, 5)$ , C  $(-2, -3, 5)$  and D  $(1, -6, -7)$  is equal to

**Options :**

71550513397. 48

71550513398.  $8\sqrt{38}$

71550513399.  $9\sqrt{38}$

71550513400. 54

**Question Number : 15 Question Id : 7155054236 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**

शीर्षो A (2, 1, 1), B (1, 2, 5), C (-2, -3, 5) तथा D (1, -6, -7) के चतुर्भुज ABCD का क्षेत्रफल है:

**Options :**

71550513397. 48

71550513398.  $8\sqrt{38}$

71550513399.  $9\sqrt{38}$

71550513400. 54

**Question Number : 16 Question Id : 7155054237 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 vectors  $\vec{u}_1 = \hat{i} + \hat{j} + a\hat{k}$ ,  $\vec{u}_2 = \hat{i} + b\hat{j} + \hat{k}$  and  $\vec{u}_3 = c\hat{i} + \hat{j} + \hat{k}$  be coplanar. If the vectors  $\vec{v}_1 = (a+b)\hat{i} + c\hat{j} + c\hat{k}$ ,  $\vec{v}_2 = a\hat{i} + (b+c)\hat{j} + a\hat{k}$  and  $\vec{v}_3 = b\hat{i} + b\hat{j} + (c+a)\hat{k}$  are also coplanar, then  $6(a+b+c)$  is equal to

**Options :**

71550513401. 0

71550513402. 4

71550513403. 6

71550513404. 12

**Question Number : 16 Question Id : 7155054237 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 सदिश  $\vec{u}_1 = \hat{i} + \hat{j} + a\hat{k}$ ,  $\vec{u}_2 = \hat{i} + b\hat{j} + \hat{k}$  तथा  $\vec{u}_3 = c\hat{i} + \hat{j} + \hat{k}$  सह-तलीय है।

यदि सदिश  $\vec{v}_1 = (a+b)\hat{i} + c\hat{j} + c\hat{k}$ ,  $\vec{v}_2 = a\hat{i} + (b+c)\hat{j} + a\hat{k}$ , तथा

$\vec{v}_3 = b\hat{i} + b\hat{j} + (c+a)\hat{k}$  भी सह-तलीय हैं, तो  $6(a+b+c)$  बराबर है:

**Options :**

71550513401. 0

71550513402. 4

71550513403. 6

71550513404. 12

**Question Number : 17 Question Id : 7155054238 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 probability that the random variable X takes values x is given by

$P(X = x) = k(x+1)3^{-x}$ ,  $x = 0, 1, 2, 3, \dots$ , where k is a constant, then  $P(X \geq 2)$  is equal to

**Options :**

$$71550513405. \frac{7}{18}$$

$$71550513406. \frac{11}{18}$$

$$71550513407. \frac{7}{27}$$

$$71550513408. \frac{20}{27}$$

**Question Number : 17 Question Id : 7155054238 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 यादृच्छिक चर  $X$  के मान  $x$  लेने की प्रायिकता  $P(X = x) = k(x + 1)3^{-x}$ ,  $x = 0, 1, 2, 3, \dots$  है, जहाँ  $k$  एक अचर है, तो  $P(X \geq 2)$  बराबर है:

**Options :**

$$71550513405. \frac{7}{18}$$

$$71550513406. \frac{11}{18}$$

$$71550513407. \frac{7}{27}$$

$$71550513408. \frac{20}{27}$$

**Question Number : 18 Question Id : 7155054239 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 mean and variance of 12 observations be  $\frac{9}{2}$  and 4 respectively. Later on, it was observed that two observations were considered as 9 and 10 instead of 7 and 14 respectively. If the correct variance is  $\frac{m}{n}$ , where  $m$  and  $n$  are coprime, then  $m + n$  is equal to

**Options :**

71550513409. 314

71550513410. 315

71550513411. 316

71550513412. 317

**Question Number : 18 Question Id : 7155054239 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 12 प्रेक्षणों के माध्य तथा प्रसरण क्रमशः  $\frac{9}{2}$  तथा 4 हैं। बाद में यह पाया गया कि दो प्रेक्षणों 7 तथा 14 के स्थान पर क्रमशः 9 तथा 10 ले लिए गए थे। यदि सही प्रसरण  $\frac{m}{n}$  है, जहाँ  $m$  तथा  $n$  असहभाज्य हैं, तो  $m + n$  बराबर है:

**Options :**

71550513409. 314

71550513410. 315

71550513411. 316

71550513412. 317

**Question Number : 19 Question Id : 7155054240 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 value of  $36 (4 \cos^2 9^\circ - 1)(4 \cos^2 27^\circ - 1)(4 \cos^2 81^\circ - 1)(4 \cos^2 243^\circ - 1)$  is

**Options :**

71550513413. 18

71550513414. 27

71550513415. 36

71550513416. 54

**Question Number : 19 Question Id : 7155054240 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**

$36 (4 \cos^2 9^\circ - 1)(4 \cos^2 27^\circ - 1)(4 \cos^2 81^\circ - 1)(4 \cos^2 243^\circ - 1)$  का मान है:

**Options :**

71550513413. 18

71550513414. 27

71550513415. 36

71550513416. 54

Question Number : 20 Question Id : 7155054241 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 negation of  $(p \wedge (\sim q)) \vee (\sim p)$  is equivalent to

Options :

71550513417.  $p \vee (q \vee (\sim p))$

71550513418.  $p \wedge q$

71550513419.  $p \wedge (\sim q)$

71550513420.  $p \wedge (q \wedge (\sim p))$

Question Number : 20 Question Id : 7155054241 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

$(p \wedge (\sim q)) \vee (\sim p)$  का निषेधन किसके तुल्य है?

Options :

71550513417.  $p \vee (q \vee (\sim p))$

71550513418.  $p \wedge q$

71550513419.  $p \wedge (\sim q)$

71550513420.  $p \wedge (q \wedge (\sim p))$

## Mathematics Section B

|  |           |
|--|-----------|
| Section Id :   | 715505260 |
| Section Number :   | 2         |
| 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 :   | 715505260 |
| Question Shuffling Allowed :                                 | Yes       |
| Is Section Default? :  | null      |

Question Number : 21 Question Id : 7155054242 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

If domain of the function  $\log_e \left( \frac{6x^2 + 5x + 1}{2x - 1} \right) + \cos^{-1} \left( \frac{2x^2 - 3x + 4}{3x - 5} \right)$  is  $(\alpha, \beta) \cup (\gamma, \delta]$ , then  $18(\alpha^2 + \beta^2 + \gamma^2 + \delta^2)$

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 : 21 Question Id : 7155054242 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

यदि फलन  $\log_e \left( \frac{6x^2 + 5x + 1}{2x - 1} \right) + \cos^{-1} \left( \frac{2x^2 - 3x + 4}{3x - 5} \right)$  का प्रांत  $(\alpha, \beta) \cup (\gamma, \delta]$  है,

तो  $18(\alpha^2 + \beta^2 + \gamma^2 + \delta^2)$  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 : 22 Question Id : 7155054243 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Let  $m$  and  $n$  be the numbers of real roots of the quadratic equations

$x^2 - 12x + [x] + 31 = 0$  and  $x^2 - 5|x + 2| - 4 = 0$  respectively, where  $[x]$  denotes the greatest integer  $\leq x$ . Then  $m^2 + mn + n^2$  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 : 7155054243 Question Type : SA Calculator : None

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

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

माना समीकरणों  $x^2 - 12x + [x] + 31 = 0$  तथा  $x^2 - 5|x + 2| - 4 = 0$  के वास्तविक मूलों की संख्या क्रमशः  $m$  तथा  $n$  है, जहाँ  $[x]$  महत्तम पूर्णांक  $\leq x$  है। तो  $m^2 + mn + n^2$  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 : 7155054244 Question Type : SA Calculator : None**

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

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

Let  $R = \{a, b, c, d, e\}$  and  $S = \{1, 2, 3, 4\}$ . Total number of onto functions  $f: R \rightarrow S$  such that  $f(a) \neq 1$ , 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 : 23 Question Id : 7155054244 Question Type : SA Calculator : None**

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

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

माना  $R = \{a, b, c, d, e\}$  तथा  $S = \{1, 2, 3, 4\}$  हैं। आच्छादक फलनों  $f: R \rightarrow S$  जिनके लिए  $f(a) \neq 1$  है, की कुल 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 : 7155054245 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Let  $0 < z < y < x$  be three real numbers such that  $\frac{1}{x}, \frac{1}{y}, \frac{1}{z}$  are in an arithmetic

progression and  $x, \sqrt{2}y, z$  are in a geometric progression. If  $xy + yz + zx = \frac{3}{\sqrt{2}}xyz$

, then  $3(x + y + z)^2$  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 : 24 Question Id : 7155054245 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

माना तीन वास्तविक संख्याएँ  $0 < z < y < x$  इस प्रकार हैं कि  $\frac{1}{x}, \frac{1}{y}, \frac{1}{z}$  एक समांतर श्रेणी में

हैं तथा  $x, \sqrt{2}y, z$  एक गुणोत्तर श्रेणी में हैं। यदि  $xy + yz + zx = \frac{3}{\sqrt{2}}xyz$  है, तो

$3(x + y + z)^2$  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 :** 25 **Question Id :** 7155054246 **Question Type :** SA **Calculator :** None

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

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

Let  $k$  and  $m$  be positive real numbers such that the function

$f(x) = \begin{cases} 3x^2 + k\sqrt{x+1}, & 0 < x < 1 \\ mx^2 + k^2, & x \geq 1 \end{cases}$  is differentiable for all  $x > 0$ . Then  $\frac{8f'(8)}{f'\left(\frac{1}{8}\right)}$  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 :** 25 **Question Id :** 7155054246 **Question Type :** SA **Calculator :** None

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

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

माना धनात्मक वास्तविक संख्याएँ  $k$  तथा  $m$  इस प्रकार हैं कि फलन

$f(x) = \begin{cases} 3x^2 + k\sqrt{x+1}, & 0 < x < 1 \\ mx^2 + k^2, & x \geq 1 \end{cases}$  सभी  $x > 0$  के लिए अवकलनीय है। तो  $\frac{8f'(8)}{f'\left(\frac{1}{8}\right)}$  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 :** 26 **Question Id :** 7155054247 **Question Type :** SA **Calculator :** None

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

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

Let  $[t]$  denote the greatest integer function. If  $\int_0^{2.4} [x^2] dx = \alpha + \beta\sqrt{2} + \gamma\sqrt{3} + \delta\sqrt{5}$ , then  $\alpha + \beta + \gamma + \delta$  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 :** 7155054247 **Question Type :** SA **Calculator :** None

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

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

माना  $[t]$  महत्तम पूर्णांक फलन है। यदि  $\int_0^{2.4} [x^2] dx = \alpha + \beta\sqrt{2} + \gamma\sqrt{3} + \delta\sqrt{5}$  है, तो  $\alpha + \beta + \gamma + \delta$  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 : 7155054248 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 area enclosed by the lines  $x + y = 2$ ,  $y = 0$ ,  $x = 0$  and the curve  $f(x) = \min\left\{x^2 + \frac{3}{4}, 1 + [x]\right\}$  where  $[x]$

denotes the greatest integer  $\leq x$ , be A. Then the value of  $12A$  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 : 7155054248 Question Type : SA Calculator : None**

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

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

माना  $[x]$  महत्तम पूर्णांक  $\leq x$  है। माना रेखाओं  $x + y = 2$ ,  $y = 0$ ,  $x = 0$  तथा वक्र

$f(x) = \min\left\{x^2 + \frac{3}{4}, 1 + [x]\right\}$  से घिरे क्षेत्र का क्षेत्रफल A है। तो  $12A$  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 : 7155054249 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 solution curve  $x = x(y)$ ,  $0 < y < \frac{\pi}{2}$ , of the differential equation

$$(\log_e (\cos y))^2 \cos y dx - (1 + 3x \log_e (\cos y)) \sin y dy = 0 \text{ satisfy } x\left(\frac{\pi}{3}\right) = \frac{1}{2 \log_e 2}.$$

If  $x\left(\frac{\pi}{6}\right) = \frac{1}{\log_e m - \log_e n}$ , where  $m$  and  $n$  are coprime, then  $mn$  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 :** 7155054249 **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  $(\log_e (\cos y))^2 \cos y dx - (1 + 3x \log_e (\cos y)) \sin y dy = 0$ ,

का हल वक्र  $x = x(y)$ ,  $0 < y < \frac{\pi}{2}$ ;  $x\left(\frac{\pi}{3}\right) = \frac{1}{2 \log_e 2}$  को संतुष्ट करता है। यदि

$x\left(\frac{\pi}{6}\right) = \frac{1}{\log_e m - \log_e n}$  है, जहाँ  $m$  तथा  $n$  असहभाज्य हैं, तो  $mn$  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 :** 7155054250 **Question Type :** SA **Calculator :** None

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

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

The ordinates of the points P and Q on the parabola with focus (3, 0) and directrix  $x = -3$  are in the ratio 3:1. If R ( $\alpha, \beta$ ) is the point of intersection of the tangents to the parabola at P and Q, then  $\frac{\beta^2}{\alpha}$  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 :** 7155054250 **Question Type :** SA **Calculator :** None

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

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

परवलय जिसकी नाभि (3,0) तथा नियता  $x = -3$  हैं, के बिंदुओं P तथा Q की कोटियाँ 3:1 के अनुपात में हैं। यदि P तथा Q पर परवलय की स्पर्श रेखाओं का प्रतिच्छेदन बिंदु R ( $\alpha, \beta$ ) है, तो  $\frac{\beta^2}{\alpha}$  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 :** 30 **Question Id :** 7155054251 **Question Type :** SA **Calculator :** None

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

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

Let  $P_1$  be the plane  $3x - y - 7z = 11$  and  $P_2$  be the plane passing through the points (2, -1, 0), (2, 0, -1), and (5, 1, 1). If the foot of the perpendicular drawn from the point (7, 4, -1) on the line of intersection of the planes  $P_1$  and  $P_2$  is ( $\alpha, \beta, \gamma$ ), then  $\alpha + \beta + \gamma$  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 :** 30 **Question Id :** 7155054251 **Question Type :** SA **Calculator :** None

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

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

माना  $P_1$  समतल  $3x - y - 7z = 11$  है तथा बिंदुओं  $(2, -1, 0)$ ,  $(2, 0, -1)$  तथा  $(5, 1, 1)$  से होकर जाने वाला समतल  $P_2$  है। यदि बिंदु  $(7, 4, -1)$  से समतलों  $P_1$  तथा  $P_2$  की प्रतिच्छेदन रेखा पर डाले गए लंब का पाद  $(\alpha, \beta, \gamma)$  है, तो  $\alpha + \beta + \gamma$  बराबर 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>                          | 715505261 |
| <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        |

**Enable Mark as Answered Mark for Review and Clear Response :** Yes  
**Maximum Instruction Time :** 0  
**Sub-Section Number :** 1  
**Sub-Section Id :** 715505261  
**Question Shuffling Allowed :** Yes  
**Is Section Default? :** null

**Question Number : 31 Question Id : 7155054252 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 |                 |
|--------|--------------------------|---------|-----------------|
| A.     | Torque                   | I.      | $ML^{-2}T^{-2}$ |
| B.     | Stress                   | II.     | $ML^2T^{-2}$    |
| C.     | Pressure gradient        | III.    | $ML^{-1}T^{-1}$ |
| D.     | Coefficient of viscosity | IV.     | $ML^{-1}T^{-2}$ |

Choose the correct answer from the options given below:

**Options :**

71550513431. A-III, B-IV, C-I, D-II

71550513432. A-II, B-I, C-IV, D-III

71550513433. A-II, B-IV, C-I, D-III

71550513434. A-IV, B-II, C-III, D-I

**Question Number : 31 Question Id : 7155054252 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 का सूची II के साथ मिलान करें

| सूची I |                | सूची II |                 |
|--------|----------------|---------|-----------------|
| A.     | बल आघूर्ण      | I.      | $ML^{-2}T^{-2}$ |
| B.     | प्रतिबल        | II.     | $ML^2T^{-2}$    |
| C.     | दाब प्रवणता    | III.    | $ML^{-1}T^{-1}$ |
| D.     | श्यानता गुणांक | IV.     | $ML^{-1}T^{-2}$ |

नीचे दिए गए विकल्पों में से सही उत्तर चुनें:

Options :

71550513431. A-III, B-IV, C-I, D-II

71550513432. A-II, B-I, C-IV, D-III

71550513433. A-II, B-IV, C-I, D-III

71550513434. A-IV, B-II, C-III, D-I

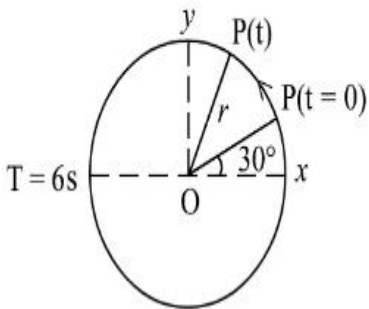
Question Number : 32 Question Id : 7155054253 Question Type : MCQ Option Shuffling : Yes Is

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

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

For particle P revolving round the centre O with radius of circular path r and angular velocity  $\omega$ , as shown in below figure, the projection of OP on the x-axis at time t is



Options :

71550513435.  $x(t) = r \cos(\omega t)$

71550513436.  $x(t) = r \cos\left(\omega t - \frac{\pi}{6} \omega\right)$

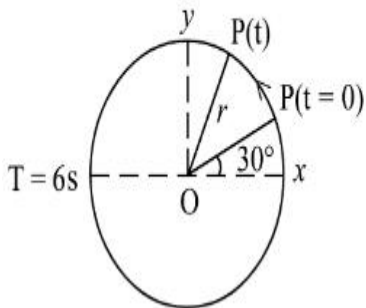
71550513437.  $x(t) = r \cos\left(\omega t + \frac{\pi}{6}\right)$

71550513438.  $x(t) = r \sin\left(\omega t + \frac{\pi}{6}\right)$

**Question Number : 32 Question Id : 7155054253 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 अनुसार,  $r$  त्रिज्या वाले पथ पर कोणीय वेग  $\omega$  से केन्द्र  $O$  के चारों ओर घूम रहे कण  $P$  के लिए, समय  $t$  पर  $OP$  का  $x$ -अक्ष पर प्रक्षेपण (प्रोजेक्सन) है:



**Options :**

71550513435.  $x(t) = r \cos(\omega t)$

71550513436.  $x(t) = r \cos\left(\omega t - \frac{\pi}{6} \omega\right)$

71550513437.  $x(t) = r \cos\left(\omega t + \frac{\pi}{6}\right)$

71550513438.  $x(t) = r \sin\left(\omega t + \frac{\pi}{6}\right)$

**Question Number : 33 Question Id : 7155054254 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 temperature at which the kinetic energy of oxygen molecules becomes double than its value at 27°C is

**Options :**

71550513439. 327°C

71550513440. 627°C

71550513441. 927°C

71550513442. 1227°C

**Question Number : 33 Question Id : 7155054254 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**

वह तापमान, जिस पर ऑक्सीजन अणुओं की गतिज ऊर्जा का मान उनके 27°C तापमान पर गतिज ऊर्जा के मान का दोगुना हो जाएगा, वह है:

**Options :**

71550513439. 327°C

71550513440. 627°C

71550513441. 927°C

71550513442. 1227°C

**Question Number : 34 Question Id : 7155054255 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**

Work done by a Carnot engine operating between temperatures 127°C and 27°C is 2 kJ. The amount of heat transferred to the engine by the reservoir is :

**Options :**

71550513443. 2 kJ

71550513444. 2.67 kJ

71550513445. 8 kJ

71550513446. 4 kJ

**Question Number : 34 Question Id : 7155054255 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**

127°C एवं 27°C तापमानों के मध्य कार्यरत एक कॉर्नो इंजन द्वारा किया गया कार्य 2 kJ है। भंडार द्वारा इंजन को दी गई ऊष्मा की मात्रा है:

**Options :**

71550513443. 2 kJ

71550513444. 2.67 kJ

71550513445. 8 kJ

71550513446. 4 kJ

**Question Number : 35 Question Id : 7155054256 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 hydraulic automobile lift is designed to lift vehicles of mass 5000 kg. The area of cross section of the cylinder carrying the load is  $250 \text{ cm}^2$ . The maximum pressure the smaller piston would have to bear is [Assume  $g = 10 \text{ m/s}^2$ ]:

**Options :**

71550513447.  $20 \times 10^{+6} \text{ Pa}$

71550513448.  $2 \times 10^{+5} \text{ Pa}$

71550513449.  $200 \times 10^{+6} \text{ Pa}$

71550513450.  $2 \times 10^{+6} \text{ Pa}$

**Question Number : 35 Question Id : 7155054256 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 हाइड्रोलिक ऑटोमोबाइल लिफ्ट को 5000 kg द्रव्यमान तक के वाहनों को उठाने के लिए बनाया गया है। भार उठाने वाले बेलन की अनुप्रस्थ काट का क्षेत्रफल  $250 \text{ cm}^2$  है। अपेक्षाकृत छोटे पिस्टन द्वारा सहे जा सकने वाला अधिकतम दाब है (माना  $g = 10 \text{ m/s}^2$ ):

**Options :**

71550513447.  $20 \times 10^{+6} \text{ Pa}$

71550513448.  $2 \times 10^{+5} \text{ Pa}$

71550513449.  $200 \times 10^{+6}$  Pa

71550513450.  $2 \times 10^{+6}$  Pa

**Question Number : 36 Question Id : 7155054257 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 acceleration due to gravity at height  $h$  above the earth if  $h \ll R$  (Radius of earth) is given by

**Options :**

71550513451. 
$$g' = g \left( 1 - \frac{2h}{R} \right)$$

71550513452. 
$$g' = g \left( 1 - \frac{h}{2R} \right)$$

71550513453. 
$$g' = g \left( 1 - \frac{h^2}{2R^2} \right)$$

71550513454. 
$$g' = g \left( 1 - \frac{2h^2}{R^2} \right)$$

**Question Number : 36 Question Id : 7155054257 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  $h \ll R$  (पृथ्वी की त्रिज्या), पृथ्वी से  $h$  ऊँचाई पर गुरुत्वीय त्वरण होगा:

**Options :**

71550513451. 
$$g' = g \left( 1 - \frac{2h}{R} \right)$$

71550513452. 
$$g' = g \left( 1 - \frac{h}{2R} \right)$$

71550513453. 
$$g' = g \left( 1 - \frac{h^2}{2R^2} \right)$$

71550513454. 
$$g' = g \left( 1 - \frac{2h^2}{R^2} \right)$$

**Question Number : 37 Question Id : 7155054258 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 orbital angular momentum of a satellite is  $L$ , when it is revolving in a circular orbit at height  $h$  from earth surface. If the distance of satellite from the earth centre is increased by eight times to its initial value, then the new angular momentum will be-

**Options :**

71550513455.  $3L$

71550513456.  $4L$

71550513457.  $8L$

71550513458.  $9L$

**Question Number : 37 Question Id : 7155054258 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**

पृथ्वी तल से  $h$  ऊँचाई पर वृत्तीय कक्षा में परिक्रमण कर रहे एक उपग्रह का कक्षीय कोणीय संवेग  $L$  है। यदि पृथ्वी के केन्द्र से उपग्रह की दूरी को इसके प्रारम्भिक मान का आठ गुना बढ़ा दिया जाए, तो नया कोणीय संवेग होगा:

**Options :**

71550513455. 3L

71550513456. 4L

71550513457. 8L

71550513458. 9L

**Question Number : 38 Question Id : 7155054259 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:

**Statement I :** Area under velocity- time graph gives the distance travelled by the body in a given time.

**Statement II :** Area under acceleration- time graph is equal to the change in velocity- in the given time.

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

**Options :**

71550513459. Both Statement I and Statement II are true.

71550513460. Both Statement I and Statement II are False.

71550513461. Statement I is correct but Statement II is false.

71550513462. Statement I is incorrect but Statement II is true.

**Question Number : 38 Question Id : 7155054259 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 दिए गए हैं:

**कथन I :** वेग समय अभिरेख के नीचे का क्षेत्रफल, वस्तु द्वारा दिए गए समय में तय की गई दूरी को प्रदर्शित करता है।

**कथन II :** त्वरण समय अभिरेख के नीचे का क्षेत्रफल, दिए गए समय में वेग में हुए परिवर्तन को प्रदर्शित करता है।

उपर्युक्त कथनों के संदर्भ में, नीचे दिए गए विकल्पों में से सर्वाधिक उपयुक्त उत्तर चुनें:

**Options :**

71550513459. कथन I एवं कथन II दोनों सत्य हैं।

71550513460. कथन I एवं कथन II दोनों असत्य हैं।

71550513461. कथन I सत्य है परन्तु कथन II गलत है।

71550513462. कथन I असत्य है परन्तु कथन II सत्य है।

**Question Number : 39 Question Id : 7155054260 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 trajectory of projectile, projected from the ground is given by  $y = x - \frac{x^2}{20}$ . Where  $x$  and  $y$  are measured in meter. The maximum height attained by the projectile will be.

**Options :**

71550513463. 5 m

71550513464.  $10\sqrt{2}$ m

71550513465. 10 m

71550513466. 200 m

**Question Number : 39 Question Id : 7155054260 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**

धरातल से प्रक्षेपित किए गए प्रक्षेप्य के पथ को  $y = x - \frac{x^2}{20}$  द्वारा दिया गया है, जहाँ  $x$  एवं  $y$  मीटर में मापे गए हैं। प्रक्षेप्य द्वारा प्राप्त अधिकतम ऊँचाई होगी:

**Options :**

71550513463. 5 m

71550513464.  $10\sqrt{2}$ m

71550513465. 10 m

71550513466. 200 m

**Question Number : 40 Question Id : 7155054261 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 bullet of mass 0.1 kg moving horizontally with speed  $400 \text{ ms}^{-1}$  hits a wooden block of mass 3.9 kg kept on a horizontal rough surface. The bullet gets embedded into the block and moves 20 m before coming to rest. The coefficient of friction between the block and the surface is \_\_\_\_\_.

(Given  $g = 10 \text{ m/s}^2$ )

**Options :**

71550513467. 0.25

71550513468. 0.50

71550513469. 0.65

71550513470. 0.90

**Question Number : 40 Question Id : 7155054261 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**

$400 \text{ ms}^{-1}$  की चाल से क्षैतिज दिशा में चलती हुई 0.1 kg द्रव्यमान की एक गोली, खुरदरे क्षैतिज तल पर रखे 3.9 kg द्रव्यमान वाले लकड़ी के गुटके से टकराती है। गोली, गुटके में धंस जाती है एवं संयुक्त निकाय रुकने से पहले 20 m चलता है। गुटके एवं तल के बीच का घर्षण गुणांक \_\_\_\_\_ है।

(दिया है  $g = 10 \text{ m/s}^2$ )

**Options :**

71550513467. 0.25

71550513468. 0.50

71550513469. 0.65

71550513470. 0.90

**Question Number : 41 Question Id : 7155054262 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**

Electric potential at a point 'P' due to a point charge of  $5 \times 10^{-9} \text{C}$  is 50 V. The distance of 'P' from the point charge is:

(Assume,  $\frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{Nm}^2\text{C}^{-2}$ )

**Options :**

71550513471. 90 cm

71550513472. 3 cm

71550513473. 9 cm

71550513474. 0.9 cm

**Question Number : 41 Question Id : 7155054262 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**

$5 \times 10^{-9} \text{C}$  वाले बिंदु आवेश के कारण, बिंदु 'P' पर विद्युत विभव 50 V है। बिंदु 'P' की बिंदु आवेश से दूरी है:

(माना,  $\frac{1}{4\pi\epsilon_0} = 9 \times 10^9 \text{Nm}^2\text{C}^{-2}$ )

**Options :**

71550513471. 90 cm

71550513472. 3 cm

71550513473. 9 cm

71550513474. 0.9 cm

**Question Number : 42 Question Id : 7155054263 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 power radiated from a linear antenna of length  $l$  is proportional to

(Given,  $\lambda$  = Wavelength of wave):

**Options :**

71550513475.  $\frac{l}{\lambda}$

71550513476.  $\frac{l}{\lambda^2}$

71550513477.  $\left(\frac{l}{\lambda}\right)^2$

71550513478.  $\frac{l^2}{\lambda}$

**Question Number : 42 Question Id : 7155054263 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**

$l$  लम्बाई वाले सरल रेखीय ऐंटीना से प्रेषित हुई विकिरण शक्ति निम्न के अनुक्रमानुपाती होती है

(दिया है,  $\lambda$  = तरंग का तरंगदैर्घ्य):

**Options :**

71550513475.  $\frac{I}{\lambda}$

71550513476.  $\frac{I}{\lambda^2}$

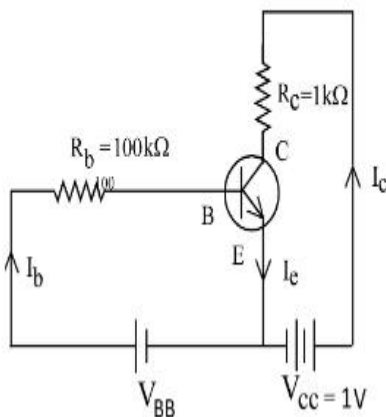
71550513477.  $\left(\frac{I}{\lambda}\right)^2$

71550513478.  $\frac{I^2}{\lambda}$

**Question Number : 43 Question Id : 7155054264 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 given transistor amplifier circuit in CE configuration  $V_{CC} = 1\text{ V}$ ,  $R_C = 1\text{ k}\Omega$ ,  $R_b = 100\text{ k}\Omega$  and  $\beta = 100$ .  
Value of base current  $I_b$  is



**Options :**

71550513479.  $I_b = 0.1\ \mu\text{A}$

71550513480.  $I_b = 10\ \mu\text{A}$



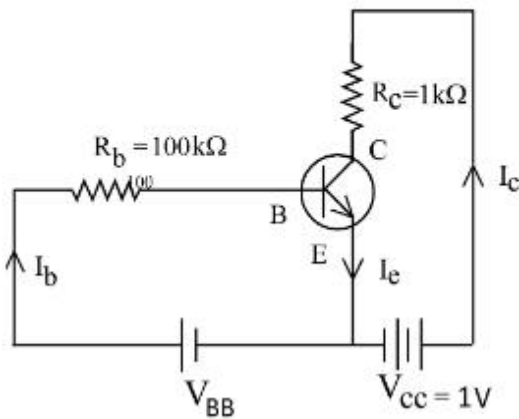
71550513481.  $I_b = 1.0 \mu\text{A}$

71550513482.  $I_b = 100 \mu\text{A}$

**Question Number : 43 Question Id : 7155054264 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**

दिए गए ट्रांजिस्टर प्रवर्धक परिपथ के CE (उभयनिष्ठ उत्सर्जक) अभिविन्यास में,  $V_{CC} = 1 \text{ V}$ ,  $R_C = 1 \text{ k}\Omega$ ,  $R_b = 100 \text{ k}\Omega$  एवं  $\beta = 100$  है आधार धारा  $I_b$  का मान है:



**Options :**

71550513479.  $I_b = 0.1 \mu\text{A}$

71550513480.  $I_b = 10 \mu\text{A}$

71550513481.  $I_b = 1.0 \mu\text{A}$

71550513482.  $I_b = 100 \mu\text{A}$

**Question Number : 44 Question Id : 7155054265 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 radio active material is reduced to  $1/8$  of its original amount in 3 days.

If  $8 \times 10^{-3}$  kg of the material is left after 5 days the initial amount of the material is

**Options :**

71550513483. 32 g

71550513484. 40 g

71550513485. 256 g

71550513486. 64 g

**Question Number : 44 Question Id : 7155054265 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**

कोई रेडियोएक्टिव पदार्थ 3 दिन में घटकर अपनी वास्तविक मात्रा का  $1/8$  भाग रह जाता है। यदि 5 दिन बाद  $8 \times 10^{-3}$  kg पदार्थ बचता है तो, पदार्थ की प्रारम्भिक मात्रा है:

**Options :**

71550513483. 32 g

71550513484. 40 g

71550513485. 256 g

71550513486. 64 g

**Question Number : 45 Question Id : 7155054266 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**

In photo electric effect

- A. The photocurrent is proportional to the intensity of the incident radiation.
- B. Maximum Kinetic energy with which photoelectrons are emitted depends on the intensity of incident light.
- C. Max. K.E with which photoelectrons are emitted depends on the frequency of incident light.
- D. The emission of photoelectrons require a minimum threshold intensity of incident radiation.
- E. Max. K.E of the photoelectrons is independent of the frequency of the incident light.

Choose the correct answer from the options given below:

**Options :**

71550513487. A and B only

71550513488. B and C only

71550513489. A and C only

71550513490. A and E only

**Question Number : 45 Question Id : 7155054266 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**

प्रकाश वैद्युत प्रभाव में

- A. प्रकाश धारा, आपतित विकिरण की तीव्रता के अनुक्रमानुपाती होती है।
- B. जिस अधिकतम गतिज ऊर्जा से प्रकाश इलेक्ट्रॉन उत्सर्जित होते हैं, वह आपतित प्रकाश की तीव्रता पर निर्भर करती है।
- C. जिस अधिकतम गतिज ऊर्जा से प्रकाश इलेक्ट्रॉन उत्सर्जित होते हैं, वह आपतित प्रकाश की आवृत्ति पर निर्भर करता है।
- D. प्रकाश इलेक्ट्रॉनों के उत्सर्जन के लिए आपतित विकिरण की एक न्यूनतम देहली तीव्रता आवश्यक होती है।
- E. प्रकाश इलेक्ट्रॉनों की अधिकतम गतिज ऊर्जा, आपतित प्रकाश की आवृत्ति पर निर्भर नहीं करती।

नीचे दिए गए विकल्पों में से सही उत्तर चुनें:

**Options :**

71550513487. केवल A एवं B

71550513488. केवल B एवं C

71550513489. केवल A एवं C

71550513490. केवल A एवं E

**Question Number : 46 Question Id : 7155054267 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 width of fringe is 2 mm on the screen in a double slits experiment for the light of wavelength of 400 nm. The width of the fringe for the light of wavelength 600 nm will be:

**Options :**

71550513491. 2 mm

71550513492. 3 mm

71550513493. 4 mm

71550513494. 1.33 mm

**Question Number : 46 Question Id : 7155054267 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**

द्विझिरी प्रयोग में, 400 nm तरंगदैर्घ्य के प्रकाश के लिए पर्दे पर प्राप्त फ्रिंज की चौड़ाई 2mm है। 600 nm तरंगदैर्घ्य वाले प्रकाश के लिए फ्रिंज चौड़ाई होगी:

**Options :**

71550513491. 2 mm

71550513492. 3 mm

71550513493. 4 mm

71550513494. 1.33 mm

**Question Number : 47 Question Id : 7155054268 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 waves emitted when a metal target is bombarded with high energy electrons are

**Options :**

71550513495. Radio Waves

71550513496. Infrared rays

71550513497. Microwaves

71550513498. X-rays

**Question Number : 47 Question Id : 7155054268 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**

उच्च ऊर्जा वाले इलेक्ट्रॉनों की बमबारी धात्विक लक्ष्य पर करने से उत्सर्जित हुई तरंगे हैं:

**Options :**

71550513495. रेडियो तरंगे

71550513496. अवरक्त किरणे

71550513497. सूक्ष्म तरंगे

71550513498. X-किरणें

**Question Number : 48 Question Id : 7155054269 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**

An emf of 0.08 V is induced in a metal rod of length 10 cm held normal to a uniform magnetic field of 0.4 T, when moves with a velocity of:

**Options :**

71550513499.  $20 \text{ ms}^{-1}$

71550513500.  $2 \text{ ms}^{-1}$

71550513501.  $0.5 \text{ ms}^{-1}$

71550513502.  $3.2 \text{ ms}^{-1}$

**Question Number : 48 Question Id : 7155054269 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**

0.4 T के किसी एकसमान चुम्बकीय क्षेत्र में, क्षेत्र के लम्बवत 10 cm लम्बी एक धात्विक छड़ में 0.08 V का विद्युत वाहक बल प्रेरित होता है, जब यह निम्न वेग से गति करती है:

**Options :**

71550513499.  $20 \text{ ms}^{-1}$

71550513500.  $2 \text{ ms}^{-1}$

71550513501.  $0.5 \text{ ms}^{-1}$

71550513502.  $3.2 \text{ ms}^{-1}$

**Question Number : 49 Question Id : 7155054270 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** : Electromagnets are made of soft iron.

**Reason R** : Soft iron has high permeability and low retentivity.

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

**Options :**

71550513503. Both **A** and **R** are correct and **R** is the correct explanation of **A**

71550513504. Both **A** and **R** are correct but **R** is **NOT** the correct explanation of **A**

71550513505. **A** is correct but **R** is not correct

71550513506. **A** is not correct but **R** is correct

**Question Number : 49 Question Id : 7155054270 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 दिए गए हैं, एक को अभिकथन **A** एवं दूसरे को कारण **R** कहा गया है।

**अभिकथन A :** विद्युतचुम्बक नरम लोहे की बनी होती हैं।

**कारण R :** नरम लोहे में उच्च चुम्बकशीलता एवं निम्न धारणशीलता होती है।

उपर्युक्त कथनों के संदर्भ में, नीचे दिए गए विकल्पों में से सही उत्तर चुनें:

**Options :**

71550513503. **A** एवं **R** दोनों सही हैं तथा **A** की सही व्याख्या **R** है

71550513504. **A** एवं **R** दोनों सही हैं तथा **A** की सही व्याख्या **R** नहीं है

71550513505. **A** सही है परन्तु **R** गलत है

71550513506. **A** गलत है परन्तु **R** सही है

**Question Number : 50 Question Id : 7155054271 Question Type : MCQ Option Shuffling : Yes Is**

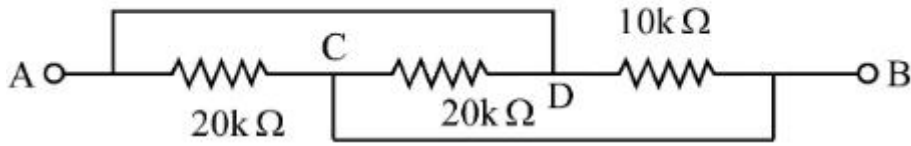


**Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum**

**Instruction Time : 0**

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

The equivalent resistance between A and B as shown in figure is:



**Options :**

71550513507. 5 kΩ

71550513508. 10 kΩ

71550513509. 20 kΩ

71550513510. 30 kΩ

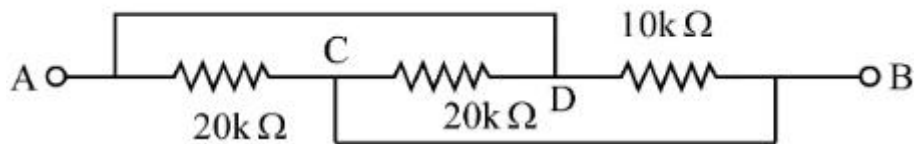
**Question Number : 50 Question Id : 7155054271 Question Type : MCQ Option Shuffling : Yes Is**

**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 A एवं B के बीच का तुल्य प्रतिरोध है:



**Options :**

71550513507. 5 kΩ

71550513508. 10 kΩ

71550513509. 20 kΩ

## Physics Section B

|   |           |
|---|-----------|
| <b>Section Id :</b>   | 715505262 |
| <b>Section Number :</b>   | 4         |
| <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       |
| <b>Maximum Instruction Time :</b>                                   | 0         |
| <b>Sub-Section Number :</b>   | 1         |
| <b>Sub-Section Id :</b>   | 715505262 |
| <b>Question Shuffling Allowed :</b>                                 | Yes       |
| <b>Is Section Default? :</b>  | null      |

**Question Number : 51 Question Id : 7155054272 Question Type : SA Calculator : None**

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

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

A guitar string of length 90 cm vibrates with a fundamental frequency of 120 Hz.  
The length of the string producing a fundamental frequency of 180 Hz will be \_\_\_\_\_ cm.

**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 : 7155054272 Question Type : SA Calculator : None**

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

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

90 cm लम्बा एक गिटार का तार 120 Hz की मूलभूत आवृत्ति के साथ दोलन करता है। 180 Hz मूलभूत आवृत्ति को उत्पन्न करने के लिए तार की आवश्यक लम्बाई \_\_\_\_\_ cm होगी।

**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 : 7155054273 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 of length 1 m and cross sectional area  $10^{-4} \text{ m}^2$  is heated from  $0^\circ\text{C}$  to  $200^\circ\text{C}$  without being allowed to extend or bend. The compressive tension produced in the rod is \_\_\_\_\_  $\times 10^4 \text{ N}$ . (Given Young's modulus of steel =  $2 \times 10^{11} \text{ Nm}^{-2}$ , coefficient of linear expansion =  $10^{-5} \text{ K}^{-1}$ )

**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 : 7155054273 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

1 m लम्बी एवं  $10^{-4} \text{ m}^2$  अनुप्रस्थ काट क्षेत्रफल वाली एक स्टील की छड़ को बिना प्रसारित हुए एवं बिना मुड़े,  $0^\circ\text{C}$  से  $200^\circ\text{C}$  तक गर्म किया जाता है। छड़ में उत्पन्न संपीड्य तनाव का मान \_\_\_\_\_  $\times 10^4 \text{ N}$  है (दिया है, स्टील का यंग गुणांक  $= 2 \times 10^{11} \text{ Nm}^{-2}$ , रेखीय प्रसार गुणांक  $= 10^{-5} \text{ K}^{-1}$ )।

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

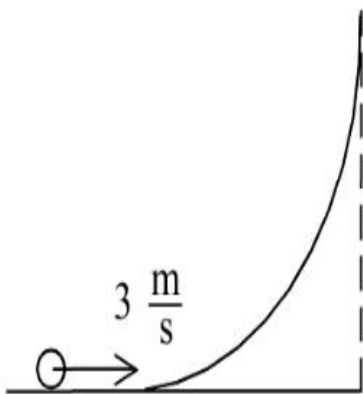
10

Question Number : 53 Question Id : 7155054274 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

A hollow spherical ball of uniform density rolls up a curved surface with an initial velocity  $3 \text{ m/s}$  (as shown in figure). Maximum height with respect to the initial position covered by it will be \_\_\_\_\_ cm (take,  $g = 10 \text{ m/s}^2$ )



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

**Possible Answers :**

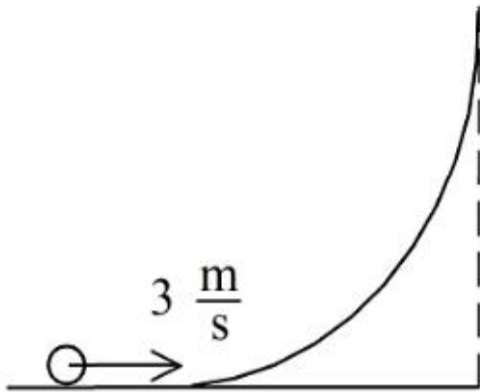
10

**Question Number : 53 Question Id : 7155054274 Question Type : SA Calculator : None**

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

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

कोई खोखली एकसमान घनत्व वाली गोलाकार गेंद, किसी वक्र तल पर  $3 \text{ m/s}$  के प्रारम्भिक वेग से लुढ़कती हुई चढ़ती है। गेंद की प्रारम्भिक अवस्था के सापेक्ष इसके द्वारा तय की गई अधिकतम ऊँचाई \_\_\_\_\_ cm होगी (यदि,  $g = 10 \text{ m/s}^2$ )।



**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 : 7155054275 Question Type : SA Calculator : None**

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

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

A body of mass  $5 \text{ kg}$  is moving with a momentum of  $10 \text{ kg ms}^{-1}$ . Now a force of  $2 \text{ N}$  acts on the body in the direction of its motion for  $5 \text{ s}$ . The increase in the Kinetic energy of the body is \_\_\_\_\_ J.

**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 : 7155054275 Question Type : SA Calculator : None**

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

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

5 kg द्रव्यमान का कोई पिण्ड,  $10 \text{ kg ms}^{-1}$  के संवेग से गति कर रहा है। अब, इस पर 2 N का बल, गति की दिशा में 5 s के लिए आरोपित होता है। पिण्ड की गतिज ऊर्जा में हुई वृद्धि \_\_\_\_\_ J है।

**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 : 7155054276 Question Type : SA Calculator : None**

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

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

A 600 pF capacitor is charged by 200 V supply. It is then disconnected from the supply and is connected to another uncharged 600 pF capacitor. Electrostatic energy lost in the process is \_\_\_\_\_  $\mu\text{J}$

**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 : 7155054276 Question Type : SA Calculator : None**

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

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

600 pF वाले एक संधारित्र को 200 V के स्रोत से आवेशित किया जाता है। फिर इसे स्रोत से हटा दिया जाता है और किसी दूसरे 600 pF धारिता वाले अनावेशित संधारित्र से जोड़ दिया जाता है। इस प्रक्रिया में स्थिर वैद्युत ऊर्जा में कमी \_\_\_\_\_  $\mu\text{J}$  की होगी।

**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 : 7155054277 Question Type : SA Calculator : None**

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

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

The ratio of wavelength of spectral lines  $H_{\alpha}$  and  $H_{\beta}$  in the Balmer series is  $\frac{x}{20}$ . The value of  $x$  is \_\_\_\_\_

**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 : 7155054277 Question Type : SA Calculator : None**

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

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

बॉमर श्रेणी में  $H_{\alpha}$  एवं  $H_{\beta}$  स्पैक्ट्रमी रेखाओं के तरंगदैर्घ्यों का अनुपात  $\frac{x}{20}$  है।  $x$  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 :** 57 **Question Id :** 7155054278 **Question Type :** SA **Calculator :** None

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

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

Two transparent media having refractive indices 1.0 and 1.5 are separated by a spherical refracting surface of radius of curvature 30 cm. The centre of curvature of surface is towards denser medium and a point object is placed on the principle axis in rarer medium at a distance of 15 cm from the pole of the surface. The distance of image from the pole of the surface is \_\_\_\_\_ cm.

**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 :** 7155054278 **Question Type :** SA **Calculator :** None

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

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

1.0 एवं 1.5 अपवर्तनांक वाले दो पारदर्शी माध्यम, 30 cm त्रिज्या वाले गोलाकार अपवर्तक सतह के द्वारा एक-दूसरे से अलग हो रहे हैं। पृष्ठ का वक्रता केन्द्र सघन माध्यम की तरफ है, एवं एक बिन्दु वस्तु, विरल माध्यम में, मुख्य अक्ष पर विभाजन तल के ध्रुव से 15 cm की दूरी पर रखी है। विभाजन तल के ध्रुव से, प्रतिबिम्ब की दूरी \_\_\_\_\_ है।

**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 :** 7155054279 **Question Type :** SA **Calculator :** None

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

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

A series combination of resistor of resistance  $100\ \Omega$ , inductor of inductance  $1\ \text{H}$  and capacitor of capacitance  $6.25\ \mu\text{F}$  is connected to an ac source. The quality factor of the circuit 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 :** 58 **Question Id :** 7155054279 **Question Type :** SA **Calculator :** None

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

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

$100\ \Omega$  वाले प्रतिरोध,  $1\ \text{H}$  प्रेरकत्व वाले प्रेरक एवं  $6.25\ \mu\text{F}$  धारिता वाले संधारित्र का श्रेणीबद्ध संयोजन किसी प्रत्यावर्ती स्रोत से जुड़ा है। परिपथ का गुणवत्ता गुणांक होगा \_\_\_\_\_ ।

**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 : 7155054280 Question Type : SA Calculator : None**

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

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

The ratio of magnetic field at the centre of a current carrying coil of radius  $r$  to the magnetic field at distance  $r$  from the centre of coil on its axis is  $\sqrt{x}:1$ . The value of  $x$  is \_\_\_\_\_

**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 : 7155054280 Question Type : SA Calculator : None**

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

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

$r$  त्रिज्या वाली धारावाही कुंडली के केन्द्र पर चुम्बकीय क्षेत्र का, कुंडली के अक्ष पर इसके केन्द्र से  $r$  दूरी पर चुम्बकीय क्षेत्र से अनुपात  $\sqrt{x}:1$  है।  $x$  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 : 60 Question Id : 7155054281 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 density of free electrons in copper is nearly  $8 \times 10^{28} \text{ m}^{-3}$ . A copper wire has its area of cross section =  $2 \times 10^{-6} \text{ m}^2$  and is carrying a current of 3.2 A. The drift speed of the electrons is \_\_\_\_\_  $\times 10^{-6} \text{ ms}^{-1}$

**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 : 7155054281 Question Type : SA Calculator : None**

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

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

ताँबे में मुक्त इलेक्ट्रॉनों का संख्या घनत्व लगभग  $8 \times 10^{28} \text{ m}^{-3}$  है। ताँबे का एक तार जिसका अनुप्रस्थ काट क्षेत्रफल  $2 \times 10^{-6} \text{ m}^2$  है एवं उसमें 3.2 A की धारा प्रवाहित हो रही है। इलेक्ट्रॉनों का अनुगमन \_\_\_\_\_  $\times 10^{-6} \text{ ms}^{-1}$  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

**Section Id :** 715505263

**Section Number :** 5

**Section type :** Online

**Mandatory or Optional :** 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>   | 715505263 |
| <b>Question Shuffling Allowed :</b>                                 | Yes       |
| <b>Is Section Default? :</b>  | null      |

**Question Number : 61 Question Id : 7155054282 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 have same number of significant figures?

- A. 0.00253
- B. 1.0003
- C. 15.0
- D. 163

Choose the correct answer from the options given below

**Options :**

71550513521. B and C only

71550513522. C and D only

71550513523. A, B and C only

71550513524. A, C and D only

**Question Number : 61 Question Id : 7155054282 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**

निम्न में से किसमें सार्थक अंकों की संख्याएँ समान है?

- A. 0.00253
- B. 1.0003
- C. 15.0
- D. 163

नीचे दिए गए विकल्पों में से सही उत्तर चुनें:

**Options :**

71550513521. केवल B और C

71550513522. केवल C और D

71550513523. केवल A, B और C

71550513524. केवल A, C और D

**Question Number : 62 Question Id : 7155054283 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**

Arrange the following gases in increasing order of van der Waals constant 'a'

- A. Ar
- B. CH<sub>4</sub>
- C. H<sub>2</sub>O
- D. C<sub>6</sub>H<sub>6</sub>

Choose the correct option from the following.

**Options :**

71550513525. A, B, C and D

71550513526. D, C, B and A

71550513527. B, C, D and A

71550513528. C, D, B and A

**Question Number : 62 Question Id : 7155054283 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**

वान्डर वाल स्थिरांक 'a' के बढ़ते क्रम में गैसों को व्यवस्थित करें:

- A. Ar
- B. CH<sub>4</sub>
- C. H<sub>2</sub>O
- D. C<sub>6</sub>H<sub>6</sub>

नीचे दिए गए विकल्पों में से सही उत्तर चुनें:

**Options :**

71550513525. A, B, C और D

71550513526. D, C, B और A

71550513527. B, C, D और A

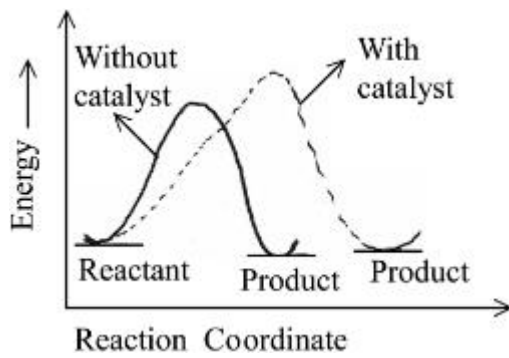
71550513528. C, D, B और A

**Question Number : 63 Question Id : 7155054284 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

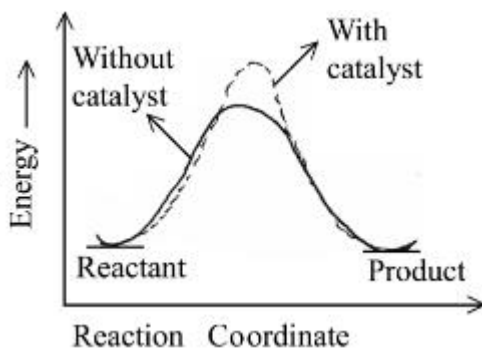
Correct Marks : 4 Wrong Marks : 1

The correct reaction profile diagram for a positive catalyst reaction.

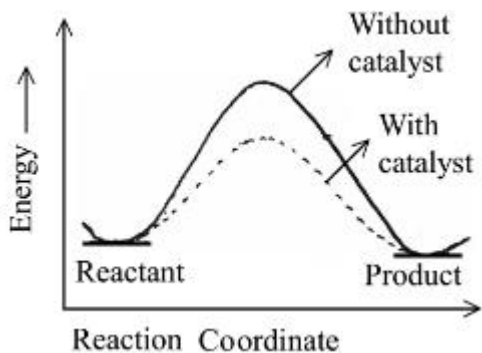
Options :



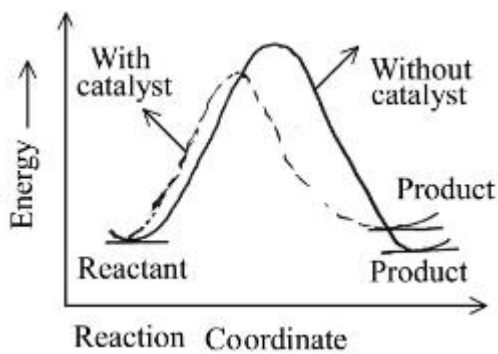
71550513529.



71550513530.



71550513531.



71550513532.

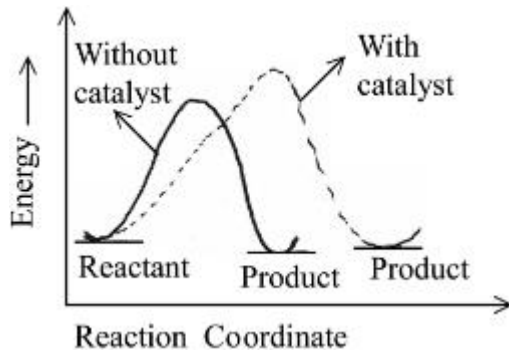
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

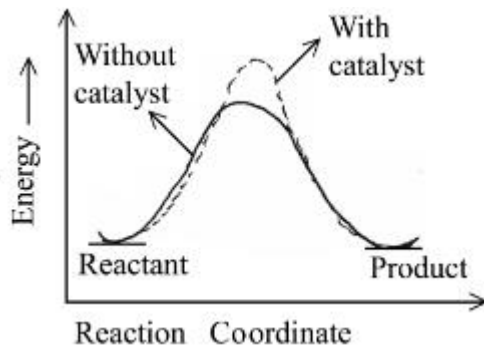
Correct Marks : 4 Wrong Marks : 1

घनात्मक उत्प्रेरक अभिक्रिया के लिए सही अभिक्रिया प्रोफाइल अरेख है:

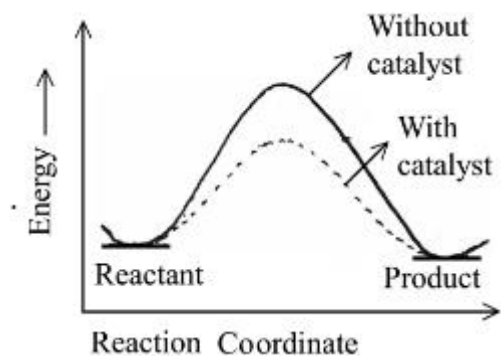
Options :



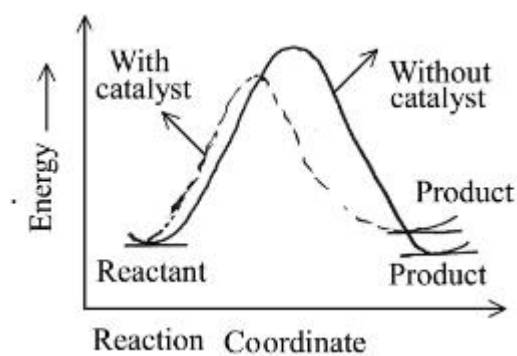
71550513529.



71550513530.



71550513531.



71550513532.



Question Number : 64 Question Id : 7155054285 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

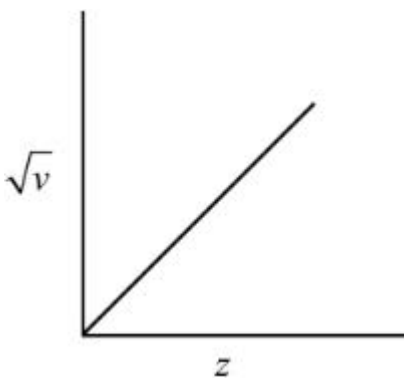
Correct Marks : 4 Wrong Marks : 1

Henry Moseley studied characteristic X-ray spectra of elements. The graph which represents his observation correctly is

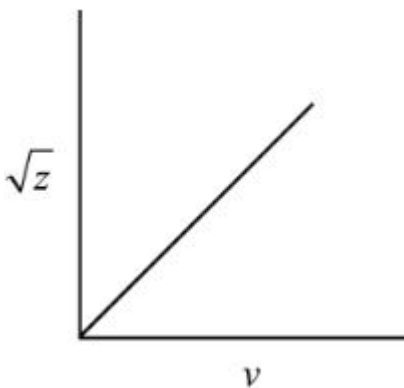
Given  $\nu$  = frequency of X-ray emitted

$Z$  = atomic number

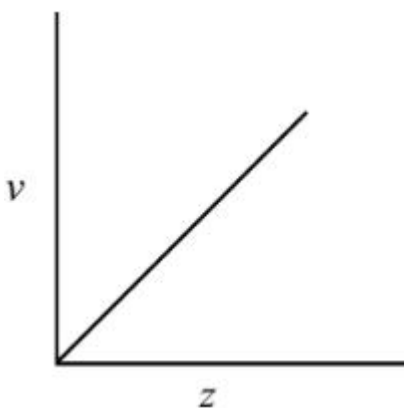
Options :



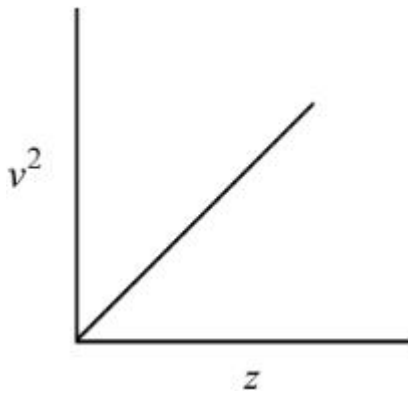
71550513533.



71550513534.



71550513535.



71550513536.

**Question Number : 64 Question Id : 7155054285 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

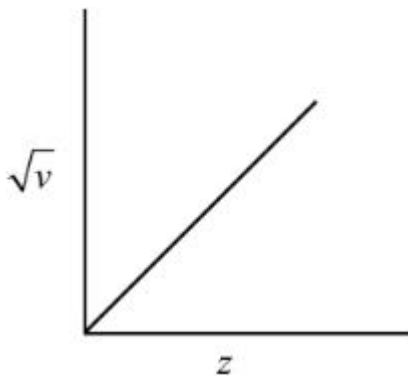
**Correct Marks : 4 Wrong Marks : 1**

हेनरी मोसले ने तत्वों के लाक्षणिक X-किरण स्पेक्ट्रा का अध्ययन किया। ग्राफ जो उनके प्रेक्षण को सही-सही निरूपित करता है, वह है:

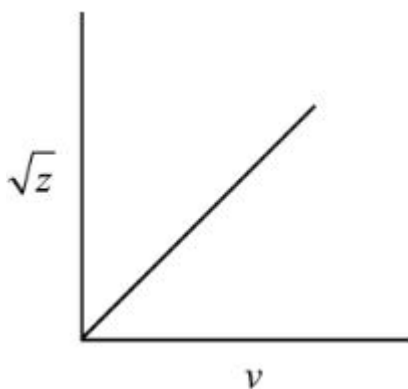
दिया गया है  $\nu$  = उत्सर्जित X-किरण की आवृत्ति

$Z$  = परमाणु संख्या

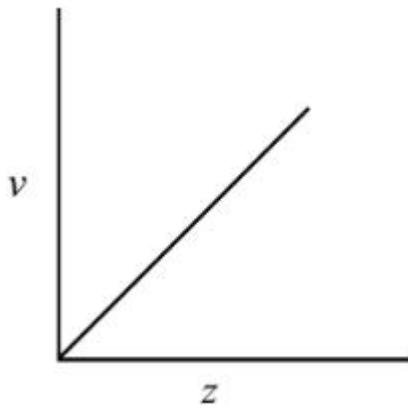
**Options :**



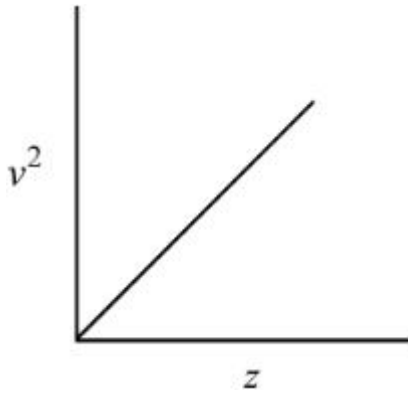
71550513533.



71550513534.



71550513535.



71550513536.

**Question Number : 65 Question Id : 7155054286 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**

In Hall - Heroult process, the following is used for reducing  $\text{Al}_2\text{O}_3$  :-

**Options :**

71550513537.  $\text{Na}_3\text{AlF}_6$

71550513538. Graphite

71550513539. Magnesium

71550513540.  $\text{CaF}_2$

Question Number : 65 Question Id : 7155054286 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

हॉल-हेरोल्ट प्रक्रम में, निम्न में से कौन  $\text{Al}_2\text{O}_3$  के अपचयन में उपयोग किया जाता है?

Options :

71550513537.  $\text{Na}_3\text{AlF}_6$

71550513538. ग्रेफाइट

71550513539. मैग्नीशियम

71550513540.  $\text{CaF}_2$

Question Number : 66 Question Id : 7155054287 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 can reduce decomposition of  $\text{H}_2\text{O}_2$  on exposure to light

Options :

71550513541. Alkali

71550513542. Urea

71550513543. Dust

71550513544. Glass containers

Question Number : 66 Question Id : 7155054287 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**

निम्न में से कौन प्रकाश की उपस्थिति में  $H_2O_2$  के अपघटन को घटा देता है?

**Options :**

71550513541. क्षार

71550513542. यूरिया

71550513543. धूल

71550513544. शीशे का पात्र

**Question Number : 67 Question Id : 7155054288 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 :** Sodium is about 30 times as abundant as potassium in the oceans.

**Reason R :** Potassium is bigger in size than sodium.

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

**Options :**

71550513545. Both **A** and **R** are true and **R** is the correct explanation of **A**

71550513546. Both **A** and **R** are true but **R** is **NOT** the correct explanation of **A**

71550513547. **A** is true but **R** is false

71550513548. A is false but R is true

**Question Number : 67 Question Id : 7155054288 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 दिए गए हैं, एक को अभिकथन A एवं दूसरे को कारण R कहा गया है।

**अभिकथन A :** समुद्रों में सोडियम, पोटैशियम की तुलना में, लगभग 30 गुना अधिक प्रचुर है।

**कारण R :** सोडियम की तुलना में पोटैशियम का आकार बड़ा है।

उपर्युक्त कथनों के प्रकाश में, नीचे दिए गए विकल्पों में से सही उत्तर चुनें:

**Options :**

71550513545. A एवं R दोनों सही हैं तथा A की सही व्याख्या R है

71550513546. A एवं R दोनों सही हैं तथा A की सही व्याख्या R नहीं है

71550513547. A सही है परन्तु R गलत है

71550513548. A गलत है परन्तु R सही है

**Question Number : 68 Question Id : 7155054289 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 good quality cement, the ratio of lime to the total of the oxides of Si, Al and Fe should be as close as to

**Options :**

71550513549. 1

71550513550. 2

71550513551. 3

71550513552. 4

**Question Number : 68 Question Id : 7155054289 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 अच्छे क्वालिटी के सीमेंट के लिए चूना एवं Si, Al और Fe के ऑक्साइडों की कुल मात्रा का अनुपात लगभग होना चाहिए:

**Options :**

71550513549. 1

71550513550. 2

71550513551. 3

71550513552. 4

**Question Number : 69 Question Id : 7155054290 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<br>Coordination Complex |  | LIST II<br>Number of unpaired electrons |   |
|--------------------------------|--|---|---|
| A.                             | $[\text{Cr}(\text{CN})_6]^{3-}$          | I.                                      | 0 |
| B.                             | $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$ | II.                                     | 3 |
| C.                             | $[\text{Co}(\text{NH}_3)_6]^{3+}$        | III.                                    | 2 |
| D.                             | $[\text{Ni}(\text{NH}_3)_6]^{2+}$        | IV.                                     | 4 |

Choose the correct answer from the options given below:

**Options :**

71550513553. A-II, B-IV, C-I, D-III

71550513554. A-III, B-IV, C-I, D-II

71550513555. A-II, B-I, C-IV, D-III

71550513556. A-IV, B-III, C-II, D-I

Question Number : 69 Question Id : 7155054290 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 का मिलान सूची II से करें

| सूची I<br>अपसहसंयोजन यौगिक |  | सूची II<br>अयुग्मिच इलेक्ट्रॉनों की संख्या |   |
|----------------------------|--|--|---|
| A.                         | $[\text{Cr}(\text{CN})_6]^{3-}$          | I.   | 0 |
| B.                         | $[\text{Fe}(\text{H}_2\text{O})_6]^{2+}$ | II.  | 3 |
| C.                         | $[\text{Co}(\text{NH}_3)_6]^{3+}$        | III.                                       | 2 |
| D.                         | $[\text{Ni}(\text{NH}_3)_6]^{2+}$        | IV.  | 4 |

नीचे दिए गए विकल्पों में से सही उत्तर चुनें:

**Options :**

71550513553. A-II, B-IV, C-I, D-III



71550513554. A-III, B-IV, C-I, D-II

71550513555. A-II, B-I, C-IV, D-III

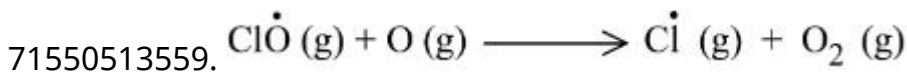
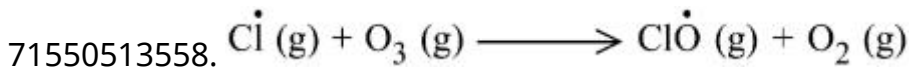
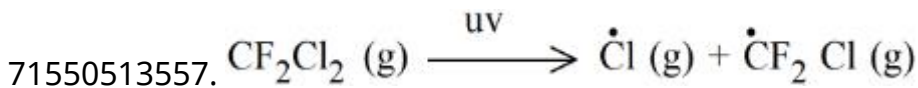
71550513556. A-IV, B-III, C-II, D-I

**Question Number : 70 Question Id : 7155054291 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 these reactions is **not** a part of breakdown of ozone in stratosphere?

**Options :**

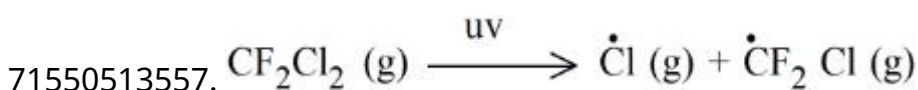


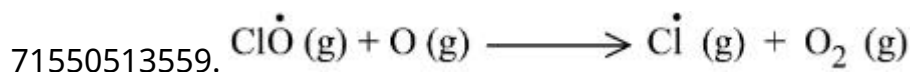
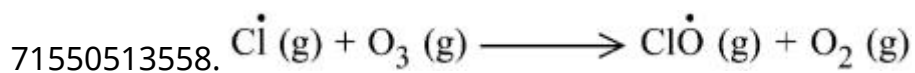
**Question Number : 70 Question Id : 7155054291 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

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

निम्न में से कौन सी अभिक्रिया समताप मंडल में ओज़ोन के विघटन का हिस्सा नहीं है?

**Options :**

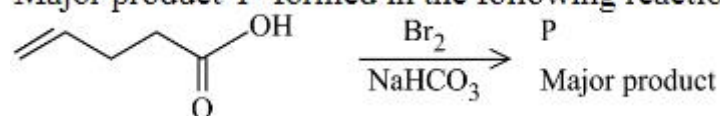




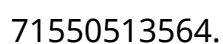
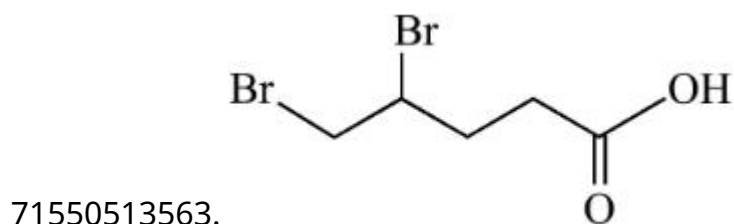
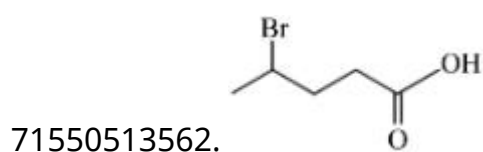
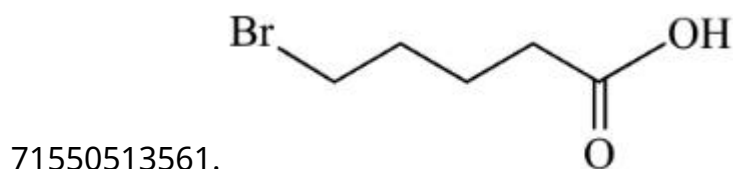
**Question Number : 71 Question Id : 7155054292 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

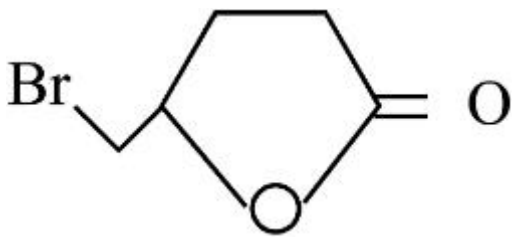
**Correct Marks : 4 Wrong Marks : 1**

Major product 'P' formed in the following reaction is:



**Options :**

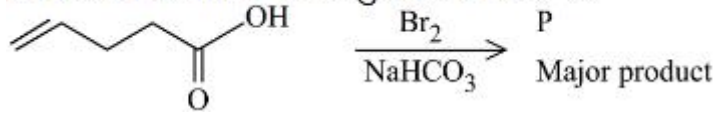




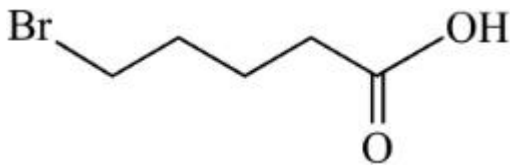
Question Number : 71 Question Id : 7155054292 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

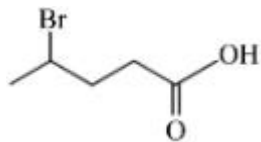
निम्न अभिक्रिया में निर्मित मुख्य उत्पाद 'P' है:



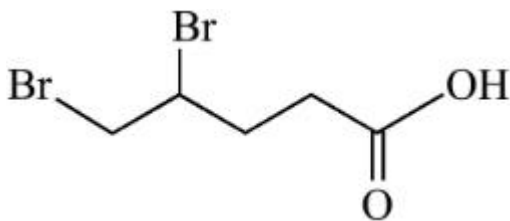
Options :



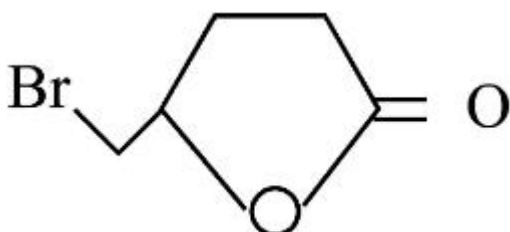
71550513561.



71550513562.



71550513563.

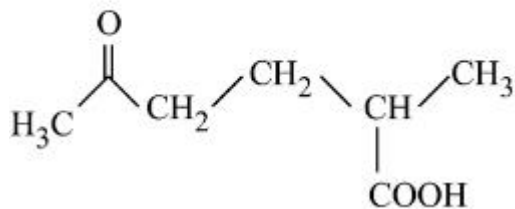


71550513564.

Question Number : 72 Question Id : 7155054293 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 correct IUPAC nomenclature for the following compound is:



Options :

71550513565. 2 - Formyl -5-methylhexan-6-oic acid

71550513566. 5-Formyl -2-methylhexanoic acid

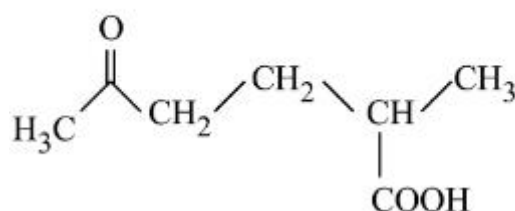
71550513567. 5-Methyl-2-oxohexan-6-oic acid

71550513568. 2-Methyl-5-oxohexanoic acid

Question Number : 72 Question Id : 7155054293 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

निम्न यौगिक का सही IUPAC नामकरण है:



Options :

71550513565. 2 - फॉर्मिल -5-मेथिलहेक्सेन-6-ओइक एसिड

71550513566. 5- फॉर्मिल -2-मेथिलहेक्सेन एसिड

71550513567. 5-मेथिल-2-ऑक्सोहेक्सेन-6-ओइक एसिड

71550513568. 2-मेथिल-5-ऑक्सोहेक्सेन एसिड

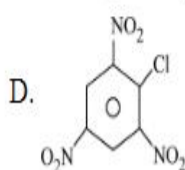
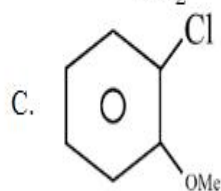
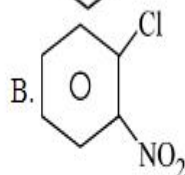
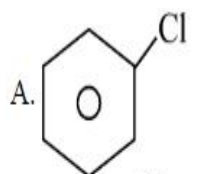
Question Number : 73 Question Id : 7155054294 Question Type : MCQ Option Shuffling : Yes Is

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

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

The correct order of reactivity of following haloarenes towards nucleophilic substitution with aqueous NaOH is :



Choose the correct answer from the options given below:

**Options :**

71550513569. A > B > D > C

71550513570. C > A > D > B

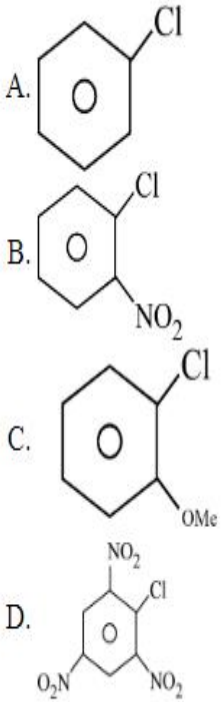
71550513571. D > C > B > A

71550513572. D > B > A > C

Question Number : 73 Question Id : 7155054294 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

निम्न हेलो एरीन के लिए, जलीय NaOH के साथ नाभिस्नेही प्रतिस्थापन अभिक्रियाओं के प्रति क्रियाशीलता का सही क्रम है:



नीचे दिए गए विकल्पों में से सही उत्तर चुनें:

Options :

71550513569.  $A > B > D > C$

71550513570.  $C > A > D > B$

71550513571.  $D > C > B > A$

71550513572.  $D > B > A > C$

Question Number : 74 Question Id : 7155054295 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 descending order of acidity for the following carboxylic acid is-

- A.  $\text{CH}_3\text{COOH}$
- B.  $\text{F}_3\text{C-COOH}$
- C.  $\text{ClCH}_2\text{-COOH}$
- D.  $\text{FCH}_2\text{-COOH}$
- E.  $\text{BrCH}_2\text{-COOH}$

Choose the correct answer from the options given below:

**Options :**

71550513573.  $\text{E} > \text{D} > \text{B} > \text{A} > \text{C}$

71550513574.  $\text{B} > \text{C} > \text{D} > \text{E} > \text{A}$

71550513575.  $\text{D} > \text{B} > \text{A} > \text{E} > \text{C}$

71550513576.  $\text{B} > \text{D} > \text{C} > \text{E} > \text{A}$

**Question Number : 74 Question Id : 7155054295 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**

निम्न कार्बोक्सिलिक अम्लों के लिए अम्लता का घटता क्रम है:

- A.  $\text{CH}_3\text{COOH}$
- B.  $\text{F}_3\text{C-COOH}$
- C.  $\text{ClCH}_2\text{-COOH}$
- D.  $\text{FCH}_2\text{-COOH}$
- E.  $\text{BrCH}_2\text{-COOH}$

नीचे दिए गए विकल्पों में से सही उत्तर चुनें:

**Options :**

71550513573.  $\text{E} > \text{D} > \text{B} > \text{A} > \text{C}$

71550513574.  $B > C > D > E > A$

71550513575.  $D > B > A > E > C$

71550513576.  $B > D > C > E > A$

**Question Number : 75 Question Id : 7155054296 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 'X' when treated with phthalic anhydride in presence of concentrated  $H_2SO_4$  yields 'Y'. 'Y' is used as an acid/base indicator. 'X' and 'Y' are respectively

**Options :**

71550513577. Anisole, methyl orange

71550513578. Toludine, Phenolphthalein

71550513579. Salicylaldehyde, Phenolphthalein

71550513580. Carboic acid, Phenolphthalein

**Question Number : 75 Question Id : 7155054296 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 'X' सान्द्र  $H_2SO_4$  की उपस्थिति में थैलिक एन्हाइड्राइड के साथ उपचारित करने पर 'Y' देता है। 'Y' का उपयोग अम्ल-क्षार सूचक के रूप में किया जाता है। 'X' एवं 'Y' हैं, क्रमशः -

**Options :**

71550513577. ऐनिसोल, मेथिल ऑरेंज



71550513578. टॉलूडीन, फीनॉलफथैलीन

71550513579. सैलिसैल्डिहाइड, फीनॉलफथैलीन

71550513580. कार्बोलिक एसिड, फीनॉलफथैलीन

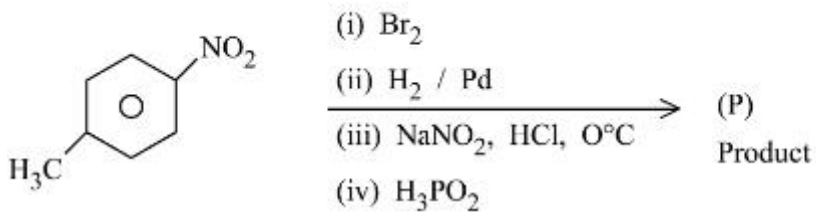
Question Number : 76 Question Id : 7155054297 Question Type : MCQ Option Shuffling : Yes Is

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

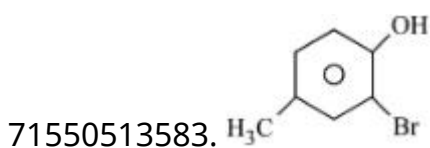
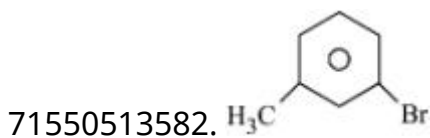
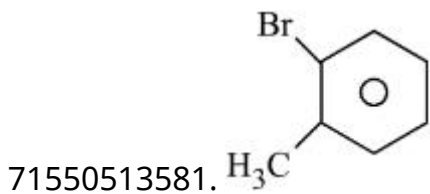
Instruction Time : 0

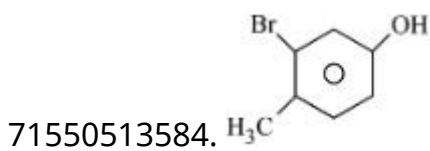
Correct Marks : 4 Wrong Marks : 1

The product (P) formed from the following multistep reaction is:



Options :

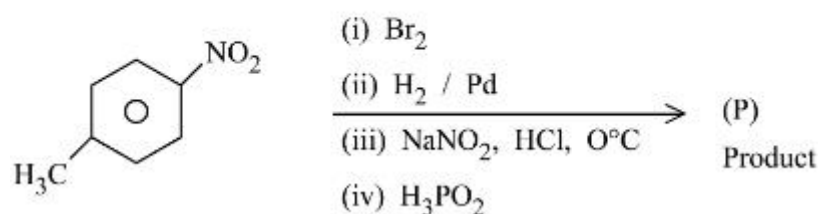




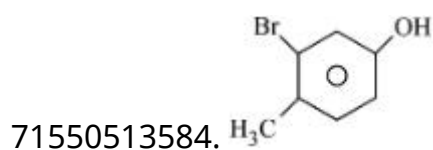
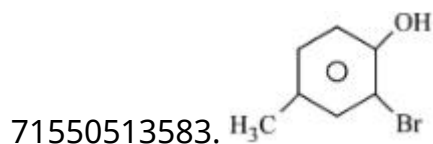
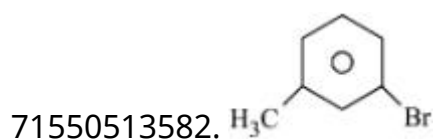
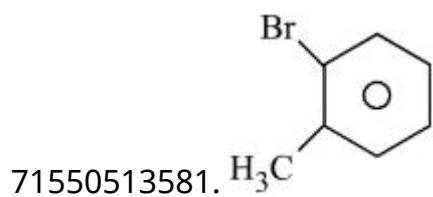
**Question Number : 76 Question Id : 7155054297 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

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

निम्न बहुचरणी अभिक्रिया में निर्मित उत्पाद (P) है:



**Options :**



**Question Number : 77 Question Id : 7155054298 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 statement/s which are true about antagonists from the following is/are:

- A. They bind to the receptor site.
- B. Get transferred inside the cell for their action.
- C. Inhibit the natural communication of the body.
- D. Mimic the natural messenger.

Choose the correct answer from the options given below:

**Options :**

71550513585. A and B

71550513586. A, C and D

71550513587. B only

71550513588. A and C

**Question Number : 77 Question Id : 7155054298 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**

निम्न में से वे कथन जो 'विरोधी' (antagonists) के संदर्भ में सही हैं, हैं:

- A. वे औषध ग्राही सतह से आबंधित होते हैं।
- B. अपने क्रिया के लिए कोशिका के अंदर स्थानांतरित हो जाते हैं।
- C. शरीर में प्राकृतिक संदेश कार्य में अवरोध उत्पन्न करते हैं।
- D. प्राकृतिक संदेशवाहक की नकल करते हैं।

नीचे दिए गए विकल्पों में से सही उत्तर चुनें:

**Options :**

71550513585. A एवं B

71550513586. A, C एवं D

71550513587. केवल B

71550513588. A एवं C

**Question Number : 78 Question Id : 7155054299 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<br>Natural amino acid |               | LIST II<br>One letter code |   |
|------------------------------|---------------|----------------------------|---|
| A.                           | Glutamic acid | I.                         | Q |
| B.                           | Glutamine     | II.                        | W |
| C.                           | Tyrosine      | III.                       | E |
| D.                           | Tryptophan    | IV.                        | Y |

Choose the correct answer from the options given below:

**Options :**

71550513589. A-III, B-I, C-IV, D-II

71550513590. A-III, B-IV, C-I, D-II

71550513591. A-II, B-I, C-IV, D-III

71550513592. A-IV, B-III, C-I, D-II

**Question Number : 78 Question Id : 7155054299 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 का मिलान सूची II से करें

| सूची I<br>प्राकृतिक ऐमीनो अम्ल |                | सूची II<br>एक अक्षर कोड |   |
|--------------------------------|----------------|-------------------------|---|
| A.                             | ग्लूटैमिक अम्ल | I.                      | Q |
| B.                             | ग्लूटेमीन      | II.                     | W |
| C.                             | टाइरोसीन       | III.                    | E |
| D.                             | ट्रिप्टोफेन    | IV.                     | Y |

नीचे दिए गए विकल्पों में से सही उत्तर चुनें:

**Options :**

71550513589. A-III, B-I, C-IV, D-II

71550513590. A-III, B-IV, C-I, D-II

71550513591. A-II, B-I, C-IV, D-III

71550513592. A-IV, B-III, C-I, D-II

**Question Number : 79 Question Id : 7155054300 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:

**Statement I :** Methyl orange is a weak acid.

**Statement II :** The benzenoid form of methyl orange is more intense/deeply coloured than the quinonoid form.

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

**Options :**

71550513593. Both statement I and Statement II are correct

71550513594. Both Statement I and Statement II are incorrect

71550513595. Statement I is correct but Statement II is incorrect

71550513596. Statement I is incorrect but Statement II is correct

**Question Number : 79 Question Id : 7155054300 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 गए हैं:

**कथन I :** मेथिल ऑरेंज एक दुर्बल अम्ल है।

**कथन II :** मेथिल ऑरेंज का बेन्जनायड रूप, क्विनोनायड रूप की तुलना में अधिक गहरे रंग का है।

उपर्युक्त कथनों के संदर्भ में, नीचे दिए गए विकल्पों में से सर्वाधिक उपयुक्त उत्तर चुनें:

**Options :**

71550513593. कथन I एवं कथन II दोनों सही हैं।

71550513594. कथन I एवं कथन II दोनों गलत हैं।

71550513595. कथन I सही है परन्तु कथन II गलत है।

71550513596. कथन I गलत है परन्तु कथन II सही है।

**Question Number : 80 Question Id : 7155054301 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:

**Statement I :** In redox titration, the indicators used are sensitive to change in pH of the solution.

**Statement II :** In acid-base titration, the indicators used are sensitive to change in oxidation potential.

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

**Options :**

71550513597. Both Statement I and Statement II are correct

71550513598. Both Statement I and Statement II are incorrect

71550513599. Statement I is correct but Statement II is incorrect

71550513600. Statement I is incorrect but Statement II is correct

**Question Number : 80 Question Id : 7155054301 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 गए हैं:

**कथन I :** रिडॉक्स अनुमापन में प्रयोग किए जाने वाले सूचक विलयन के pH में परिवर्तन के प्रति संवेदनशील होते हैं।

**कथन II :** अम्ल-क्षार अनुमापन में प्रयोग किए जाने वाले सूचक ऑक्सीकरण विभव के परिवर्तन के प्रति संवेदनशील होते हैं।

उपर्युक्त कथनों के संदर्भ में, नीचे दिए गए विकल्पों में से सर्वाधिक उपयुक्त उत्तर चुनें:

**Options :**

71550513597. कथन I एवं कथन II दोनों सही हैं।

71550513598. कथन I एवं कथन II दोनों गलत हैं।

71550513599. कथन I सही है परन्तु कथन II गलत है।

71550513600. कथन I गलत है परन्तु कथन II सही है।

## Chemistry Section B

|  |           |
|--|-----------|
| Section Id :   | 715505264 |
| Section Number :   | 6         |
| 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 :   | 715505264 |
| Question Shuffling Allowed :                                 | Yes       |
| Is Section Default? :  | null      |

Question Number : 81 Question Id : 7155054302 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 atomic orbitals from the following having 5 radial nodes is

\_\_\_\_\_.

7s, 7p, 6s, 8p, 8d

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 :** 7155054302 **Question Type :** SA **Calculator :** None

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

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

निम्न परमाणु कक्षाओं में से 5 त्रिज्य नोड रखने वाले कक्षकों की संख्या \_\_\_\_\_

7s, 7p, 6s, 8p, 8d

**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 :** 7155054303 **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 carrying a single lone pair on central atom Xenon is \_\_\_\_\_.

$\text{XeF}_5^+$ ,  $\text{XeO}_3$ ,  $\text{XeO}_2\text{F}_2$ ,  $\text{XeF}_5^-$ ,  $\text{XeO}_3\text{F}_2$ ,  $\text{XeOF}_4$ ,  $\text{XeF}_4$

**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 : 7155054303 Question Type : SA Calculator : None**

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

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

निम्न में से उन स्पीशीज़ों की संख्या जिनके केन्द्रीय परमाणु जीनान पर केवल एक एकाकी युग्म उपस्थित है \_\_\_\_\_

$\text{XeF}_5^+$ ,  $\text{XeO}_3$ ,  $\text{XeO}_2\text{F}_2$ ,  $\text{XeF}_5^-$ ,  $\text{XeO}_3\text{F}_2$ ,  $\text{XeOF}_4$ ,  $\text{XeF}_4$

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

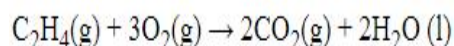
10

**Question Number : 83 Question Id : 7155054304 Question Type : SA Calculator : None**

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

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

For complete combustion of ethene,



the amount of heat produced as measured in bomb calorimeter is  $1406 \text{ kJ mol}^{-1}$  at 300K. The minimum value of  $\Delta S$  needed to reach equilibrium is (-) \_\_\_\_\_ kJ.(Nearest integer)

Given :  $R=8.3 \text{ J K}^{-1} \text{ mol}^{-1}$

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number : 83 Question Id : 7155054304 Question Type : SA Calculator : None**

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

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

एथीन के पूर्ण दहन के लिए  $C_2H_4(g) + 3O_2(g) \rightarrow 2CO_2(g) + 2H_2O(l)$

300K बम कैलोरीमीटर में मापी गयी उष्मा  $1406 \text{ kJ mol}^{-1}$  है। सम्यावस्था पर पहुँचने हेतु  $T\Delta S$  की न्यूनतम मात्रा है:(-)  
\_\_\_\_\_  $\text{kJ}$ (निकटतम पूर्णांक में)

दिया गया है:  $R=8.3 \text{ J K}^{-1} \text{ mol}^{-1}$

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number : 84 Question Id : 7155054305 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 boiling points of two solvents X and Y (having same molecular weights) are in the ratio 2:1 and their enthalpy of vaporizations are in the ratio 1:2, then the boiling point elevation constant of X is m times the boiling point elevation constant of Y. The value of m 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 : 84 Question Id : 7155054305 Question Type : SA Calculator : None**

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

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

समान अणुभार रखने वाले दो विलायकों X एवं Y के कथनांकों का अनुपात 2:1 है तथा उनके वाष्पन की एन्थैल्पियों का अनुपात 1:2 तो X के कथनांक उन्नयन स्थिरांक, Y के कथनांक उन्नयन स्थिरांक का  $m$  गुना है।  $m$  का मान है \_\_\_\_\_ (निकटतम पूर्णांक में)

**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 : 7155054306 Question Type : SA Calculator : None**

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

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

The solubility product of  $\text{BaSO}_4$  is  $1 \times 10^{-10}$  at 298K. The solubility of  $\text{BaSO}_4$  in 0.1 M  $\text{K}_2\text{SO}_4$  (aq) solution is \_\_\_\_\_  $\times 10^{-9}$  g L<sup>-1</sup> (nearest integer).

Given: Molar mass of  $\text{BaSO}_4$  is 233 g mol<sup>-1</sup>

**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 : 7155054306 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

298K पर  $\text{BaSO}_4$  का विलेयता गुणनफल  $1 \times 10^{-10}$  है। 0.1 M  $\text{K}_2\text{SO}_4$  (aq) विलयन में  $\text{BaSO}_4$  की विलेयता \_\_\_\_\_  $\times 10^{-9}$   $\text{g L}^{-1}$  है (निकटतम पूर्णांक में)

दिया गया है:  $\text{BaSO}_4$  का मोलर द्रव्यमान  $233 \text{g mol}^{-1}$  है

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 : 7155054307 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 incorrect statements from the following is \_\_\_\_\_

A. The electrical work that a reaction can perform at constant pressure and temperature is equal to the reaction Gibbs energy.

B.  $E^\circ_{\text{cell}}$  is dependent on the pressure.

C. 
$$\frac{dE^\circ_{\text{cell}}}{dT} = \frac{\Delta_r S^\circ}{nF}$$

D. A cell is operating reversibly if the cell potential is exactly balanced by an opposing source of potential difference.

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 : 7155054307 Question Type : SA Calculator : None**

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

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

निम्न में से असत्य कथनों की संख्या है:

A. स्थिर दाब एवं ताप पर किसी अभिक्रिया द्वारा किया जा सकने वाला विद्युत कार्य अभिक्रिया की गिब्स उर्जा के बराबर हो।

B.  $E^\circ_{\text{cell}}$  दाब पर निर्भर करता है।

C. 
$$\frac{dE^\circ_{\text{cell}}}{dT} = \frac{\Delta_r S^\circ}{nF}$$

D. एक सेल उत्क्रमणीय रूप में कार्य कर रहा है यदि सेल विभव विपरीत स्रोत के विभवान्तर के बिल्कुल बराबर हो।

**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 : 7155054308 Question Type : SA Calculator : None**

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

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

Coagulating value of the electrolytes  $\text{AlCl}_3$  and  $\text{NaCl}$  for  $\text{As}_2\text{S}_3$  are 0.09 and 50.04 respectively. The coagulating power of  $\text{AlCl}_3$  is  $x$  times the coagulating power of  $\text{NaCl}$ . The value of  $x$  is \_\_\_\_\_.

**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 : 7155054308 Question Type : SA Calculator : None**

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

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

As<sub>2</sub>S<sub>3</sub> के स्कंदन के लिए विद्युत अपघट्यों AlCl<sub>3</sub> एवं NaCl का स्कंदन मान क्रमशः 0.09 एवं 50.04 है। AlCl<sub>3</sub> की स्कंदन क्षमता NaCl के स्कंदन क्षमता  $x$  गुना है।  $x$  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 : 88 Question Id : 7155054309 Question Type : SA Calculator : None**

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

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

The ratio of sigma and  $\pi$  bonds present in pyrophosphoric acid is \_\_\_\_\_.

**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 : 7155054309 Question Type : SA Calculator : None**

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

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

पयथोफ़ॉस्फ़ोरिक अम्ल में उपस्थित सिग्मा एवं  $\pi$  बन्धों का अनुपात है:

**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 :** 7155054310 **Question Type :** SA **Calculator :** None

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

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

The sum of oxidation state of the metals in  $\text{Fe}(\text{CO})_5$ ,  $\text{VO}^{2+}$  and  $\text{WO}_3$  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 :** 7155054310 **Question Type :** SA **Calculator :** None

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

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

$\text{Fe}(\text{CO})_5$ ,  $\text{VO}^{2+}$  एवं  $\text{WO}_3$  में धातुओं के ऑक्सीकरण संख्याओं का योग 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 : 7155054311 Question Type : SA Calculator : None**

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

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

The observed magnetic moment of the complex  $[\text{Mn}(\text{NCS})_6]^{x-}$  is 6.06 BM. The numerical value of  $x$  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 : 7155054311 Question Type : SA Calculator : None**

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

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

संकुल  $[\text{Mn}(\text{NCS})_6]^{x-}$  का प्रेक्षित चुम्बकीय आघूर्ण 6.06 BM है।  $x$  का मान है:

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10