

# National Testing Agency

<b>Question Paper Name :</b>	109
<b>Subject Name :</b>	B TECH
<b>Creation Date :</b>	2023-04-08 13:43:43
<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>	36669429
<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>	366694160
<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>	366694160
<b>Question Shuffling Allowed :</b>	Yes
<b>Is Section Default? :</b>	null

**Question Number : 1 Question Id : 3666942931 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 number of elements in sets  $A$  and  $B$  be five and two respectively. Then the number of subsets of  $A \times B$  each having at least 3 and at most 6 elements is :

**Options :**

3666949161. 792

3666949162. 772

3666949163. 752

3666949164. 782

Question Number : 1 Question Id : 3666942931 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 समुच्चयों A तथा B में अवयवों की संख्या क्रमशः पाँच तथा दो है। तो  $A \times B$  के  
उपसमुच्चयों, जिनमें कम से कम 3 तथा अधिक से अधिक 6 अवयव हों, की संख्या है

Options :

3666949161. 792

3666949162. 772

3666949163. 752

3666949164. 782

Question Number : 2 Question Id : 3666942932 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 for  $z = \alpha + i\beta$ ,  $|z+2| = z+4(1+i)$ , then  $\alpha + \beta$  and  $\alpha\beta$  are the roots of the  
equation

Options :

3666949165.  $x^2 + 3x - 4 = 0$

3666949166.  $x^2 + 7x + 12 = 0$

3666949167.  $x^2 + 2x - 3 = 0$

3666949168.  $x^2 + x - 12 = 0$

**Question Number : 2 Question Id : 3666942932 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  $z = \alpha + i\beta$  के लिए  $|z+2| = z+4(1+i)$ , तो  $\alpha + \beta$  तथा  $\alpha\beta$  किस समीकरण के मूल हैं?

**Options :**

3666949165.  $x^2 + 3x - 4 = 0$

3666949166.  $x^2 + 7x + 12 = 0$

3666949167.  $x^2 + 2x - 3 = 0$

3666949168.  $x^2 + x - 12 = 0$

**Question Number : 3 Question Id : 3666942933 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  $\alpha, \beta, \gamma$  be the three roots of the equation  $x^3 + bx + c = 0$ . If  $\beta\gamma = 1 = -\alpha$ , then  $b^3 + 2c^3 - 3\alpha^3 - 6\beta^3 - 8\gamma^3$  is equal to

**Options :**

3666949169.  $\frac{169}{8}$



3666949170.  $\frac{155}{8}$

3666949171. 19

3666949172. 21

**Question Number : 3 Question Id : 3666942933 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  $\alpha, \beta, \gamma$  समीकरण  $x^3 + bx + c = 0$  के तीन मूल हैं। यदि  $\beta\gamma = 1 = -\alpha$ , तो  $b^3 + 2c^3 - 3\alpha^3 - 6\beta^3 - 8\gamma^3$  बराबर है।

**Options :**

3666949169.  $\frac{169}{8}$

3666949170.  $\frac{155}{8}$

3666949171. 19

3666949172. 21

**Question Number : 4 Question Id : 3666942934 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  $A = \begin{bmatrix} 2 & 1 & 0 \\ 1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$ . If  $|\text{adj}(\text{adj}(\text{adj } 2A))| = (16)^n$ , then  $n$  is equal to

**Options :**

3666949173. 10

3666949174. 8

3666949175. 12

3666949176. 9

**Question Number : 4 Question Id : 3666942934 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  $A = \begin{bmatrix} 2 & 1 & 0 \\ 1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$  है। यदि  $|\text{adj}(\text{adj}(\text{adj } 2A))| = (16)^n$  है, तो  $n$  बराबर है

**Options :**

3666949173. 10

3666949174. 8

3666949175. 12

3666949176. 9

Question Number : 5 Question Id : 3666942935 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

$$\text{Let } P = \begin{bmatrix} \frac{\sqrt{3}}{2} & \frac{1}{2} \\ -\frac{1}{2} & \frac{\sqrt{3}}{2} \end{bmatrix}, A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix} \text{ and } Q = PAP^T. \text{ If } P^T Q^{2007} P = \begin{bmatrix} a & b \\ c & d \end{bmatrix},$$

then  $2a + b - 3c - 4d$  equal to

Options :

3666949177. 2004

3666949178. 2005

3666949179. 2006

3666949180. 2007

Question Number : 5 Question Id : 3666942935 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

$$\text{माना } P = \begin{bmatrix} \frac{\sqrt{3}}{2} & \frac{1}{2} \\ -\frac{1}{2} & \frac{\sqrt{3}}{2} \end{bmatrix}, A = \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix} \text{ तथा } Q = PAP^T \text{ हैं। यदि } P^T Q^{2007} P = \begin{bmatrix} a & b \\ c & d \end{bmatrix}, \text{ तो}$$

$2a + b - 3c - 4d$  बराबर है

Options :

3666949177. 2004

3666949178. 2005

3666949179. 2006

3666949180. 2007

**Question Number : 6 Question Id : 3666942936 Question Type : MCQ Option Shuffling : Yes Is  
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum  
Instruction Time : 0**

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

The number of arrangements of the letters of the word "INDEPENDENCE"  
in which all the vowels always occur together is

**Options :**

3666949181. 14800

3666949182. 33600

3666949183. 16800

3666949184. 18000

**Question Number : 6 Question Id : 3666942936 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**

शब्द "INDEPENDENCE" के अक्षरों को लिखने के तरीकों, जिनमें सभी स्वर हमेशा एक साथ हों, की संख्या है

**Options :**

3666949181. 14800

3666949182. 33600

3666949183. 16800

3666949184. 18000

**Question Number : 7 Question Id : 3666942937 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

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

The number of ways, in which 5 girls and 7 boys can be seated at a round table so that no two girls sit together, is

**Options :**

3666949185.  $126(5!)^2$

3666949186.  $7(360)^2$

3666949187.  $7(720)^2$

3666949188. 720

**Question Number : 7 Question Id : 3666942937 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 लड़कियों तथा 7 लड़कों को एक गोल मेज पर इस प्रकार बैठाने, कि कोई भी दो लड़कियाँ एक साथ न बैठें, के तरीकों की संख्या है

**Options :**

3666949185.  $126(5!)^2$

3666949186.  $7(360)^2$

3666949187.  $7(720)^2$

3666949188. 720

**Question Number : 8 Question Id : 3666942938 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 coefficients of three consecutive terms in the expansion of  $(1+x)^n$  are in the ratio 1 : 5 : 20, then the coefficient of the fourth term is

**Options :**

3666949189. 1827

3666949190. 3654

3666949191. 5481

3666949192. 2436

**Question Number : 8 Question Id : 3666942938 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  $(1+x)^n$  के प्रकार में तीन क्रमागत पदों के गुणांकों का अनुपात 1:5:20 है, तो चौथे पद का गुणांक है

**Options :**

3666949189. 1827

3666949190. 3654

3666949191. 5481

3666949192. 2436

**Question Number : 9 Question Id : 3666942939 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  $S_K = \frac{1+2+\dots+K}{K}$  and  $\sum_{j=1}^n S_j^2 = \frac{n}{A}(Bn^2 + Cn + D)$ , where  $A, B, C, D \in \mathbb{N}$

and  $A$  has least value. Then

**Options :**

3666949193.  $A+B+C+D$  is divisible by 5

3666949194.  $A + B$  is divisible by  $D$

3666949195.  $A + B = 5(D - C)$

3666949196.  $A + C + D$  is not divisible by  $B$

**Question Number : 9 Question Id : 3666942939 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  $S_K = \frac{1+2+\dots+K}{K}$  तथा  $\sum_{j=1}^n S_j^2 = \frac{n}{A}(Bn^2 + Cn + D)$  हैं, जहाँ  $A, B, C, D \in \mathbb{N}$  है

तथा  $A$  का मान न्यूनतम है। तो

**Options :**

3666949193.  $A+B+C+D$ , 5 से विभाज्य है

3666949194.  $A+B$ ,  $D$  से विभाज्य है

3666949195.  $A+B=5(D-C)$

3666949196.  $A+C+D$ ,  $B$  से विभाज्य नहीं है

**Question Number : 10 Question Id : 3666942940 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**

$$\lim_{x \rightarrow 0} \left( \left( \frac{1 - \cos^2(3x)}{\cos^3(4x)} \right) \left( \frac{\sin^3(4x)}{(\log_e(2x+1))^5} \right) \right) \text{ is equal to } \underline{\hspace{2cm}}$$

**Options :**

3666949197. 9

3666949198. 15

3666949199. 18

3666949200. 24

**Question Number : 10 Question Id : 3666942940 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**

$$\lim_{x \rightarrow 0} \left( \left( \frac{1 - \cos^2(3x)}{\cos^3(4x)} \right) \left( \frac{\sin^3(4x)}{(\log_e(2x+1))^5} \right) \right) \text{ बराबर है}$$

**Options :**

3666949197. 9

3666949198. 15

3666949199. 18

Question Number : 11 Question Id : 3666942941 Question Type : MCQ Option Shuffling : Yes Is  
 Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum  
 Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

Let  $I(x) = \int \frac{(x+1)}{x(1+x e^x)^2} dx, x > 0$ . If  $\lim_{x \rightarrow \infty} I(x) = 0$ , then  $I(1)$  is equal to

Options :

3666949201.  $\frac{e+2}{e+1} - \log_e(e+1)$

3666949202.  $\frac{e+2}{e+1} + \log_e(e+1)$

3666949203.  $\frac{e+1}{e+2} - \log_e(e+1)$

3666949204.  $\frac{e+1}{e+2} + \log_e(e+1)$

Question Number : 11 Question Id : 3666942941 Question Type : MCQ Option Shuffling : Yes Is  
 Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum  
 Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

माना  $I(x) = \int \frac{(x+1)}{x(1+x e^x)^2} dx, x > 0$  हैं। यदि  $\lim_{x \rightarrow \infty} I(x) = 0$  है, तो  $I(1)$  बराबर है।

Options :

3666949201.  $\frac{e+2}{e+1} - \log_e(e+1)$

3666949202.  $\frac{e+2}{e+1} + \log_e(e+1)$

3666949203.  $\frac{e+1}{e+2} - \log_e(e+1)$

3666949204.  $\frac{e+1}{e+2} + \log_e(e+1)$

**Question Number : 12 Question Id : 3666942942 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 region  $\{(x, y) : x^2 \leq y \leq 8 - x^2, y \leq 7\}$  is

**Options :**

3666949205. 18

3666949206. 20

3666949207. 21

3666949208. 24

**Question Number : 12 Question Id : 3666942942 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**

क्षेत्र  $\{(x, y) : x^2 \leq y \leq 8 - x^2, y \leq 7\}$  का क्षेत्रफल है

**Options :**

3666949205. 18

3666949206. 20

3666949207. 21

3666949208. 24

**Question Number : 13 Question Id : 3666942943 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  $C(\alpha, \beta)$  be the circumcenter of the triangle formed by the lines

$$4x + 3y = 69,$$

$$4y - 3x = 17, \text{ and}$$

$$x + 7y = 61.$$

Then  $(\alpha - \beta)^2 + \alpha + \beta$  is equal to

**Options :**

3666949209. 15

3666949210. 16

3666949211. 17

3666949212. 18

**Question Number : 13 Question Id : 3666942943 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 रेखाओं

$$4x + 3y = 69,$$

$$4y - 3x = 17, \text{ तथा}$$

$$x + 7y = 61$$

द्वारा निर्मित त्रिभुज का परिकेन्द्र  $C(\alpha, \beta)$  है। तो  $(\alpha - \beta)^2 + \alpha + \beta$  बराबर है

**Options :**

3666949209. 15

3666949210. 16

3666949211. 17

3666949212. 18

**Question Number : 14 Question Id : 3666942944 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  $R$  be the focus of the parabola  $y^2 = 20x$  and the line  $y = mx + c$  intersect the parabola at two points  $P$  and  $Q$ . Let the point  $G(10, 10)$  be the centroid of the triangle  $PQR$ . If  $c - m = 6$ , then  $(PQ)^2$  is

**Options :**

3666949213. 296

3666949214. 325

3666949215. 317

3666949216. 346

**Question Number : 14 Question Id : 3666942944 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 परवलय  $y^2 = 20x$  की नाभि  $R$  है तथा रेखा  $y = mx + c$  परवलय को दो बिंदुओं  $P$  तथा  $Q$  पर काटती है। माना त्रिभुज  $PQR$  का केन्द्रक, बिंदु  $G(10, 10)$  है। यदि  $c - m = 6$  है, तो  $(PQ)^2$  बराबर है।

**Options :**

3666949213. 296

3666949214. 325

3666949215. 317

3666949216. 346

Question Number : 15 Question Id : 3666942945 Question Type : MCQ Option Shuffling : Yes Is  
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum  
Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

If the equation of the plane containing the line  $x+2y+3z-4=0=2x+y-z+5$  and perpendicular to the plane  $\vec{r} = (\hat{i} - \hat{j}) + \lambda(\hat{i} + \hat{j} + \hat{k}) + \mu(\hat{i} - 2\hat{j} + 3\hat{k})$  is  $ax+by+cz=4$ , then  $(a-b+c)$  is equal to

Options :

3666949217. 18

3666949218. 20

3666949219. 22

3666949220. 24

Question Number : 15 Question Id : 3666942945 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 समतल, जिसमें रेखा  $x+2y+3z-4=0=2x+y-z+5$  स्थित है तथा जो समतल  $\vec{r} = (\hat{i} - \hat{j}) + \lambda(\hat{i} + \hat{j} + \hat{k}) + \mu(\hat{i} - 2\hat{j} + 3\hat{k})$  के लंबवत है, का समीकरण  $ax+by+cz=4$  है, तो  $(a-b+c)$  बराबर है

Options :

3666949217. 18

3666949218. 20

3666949219. 22

3666949220. 24

**Question Number : 16 Question Id : 3666942946 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 shortest distance between the lines  $\frac{x-4}{4} = \frac{y+2}{5} = \frac{z+3}{3}$  and  $\frac{x-1}{3} = \frac{y-3}{4} = \frac{z-4}{2}$  is

**Options :**

3666949221.  $6\sqrt{3}$

3666949222.  $3\sqrt{6}$

3666949223.  $2\sqrt{6}$

3666949224.  $6\sqrt{2}$

**Question Number : 16 Question Id : 3666942946 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**

रेखाओं  $\frac{x-4}{4} = \frac{y+2}{5} = \frac{z+3}{3}$  तथा  $\frac{x-1}{3} = \frac{y-3}{4} = \frac{z-4}{2}$  के बीच न्यूनतम दूरी है

**Options :**

3666949221.  $6\sqrt{3}$

3666949222.  $3\sqrt{6}$

3666949223.  $2\sqrt{6}$

3666949224.  $6\sqrt{2}$

**Question Number : 17 Question Id : 3666942947 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 points with position vectors  $\alpha\hat{i} + 10\hat{j} + 13\hat{k}$ ,  $6\hat{i} + 11\hat{j} + 11\hat{k}$ ,  $\frac{9}{2}\hat{i} + \beta\hat{j} - 8\hat{k}$  are collinear, then  $(19\alpha - 6\beta)^2$  is equal to

**Options :**

3666949225. 16

3666949226. 25

3666949227. 36

3666949228. 49

Question Number : 17 Question Id : 3666942947 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 स्थिति सदिश  $\alpha\hat{i} + 10\hat{j} + 13\hat{k}$ ,  $6\hat{i} + 11\hat{j} + 11\hat{k}$ ,  $\frac{9}{2}\hat{i} + \beta\hat{j} - 8\hat{k}$  के बिंदु एक रेखा में हैं, तो  $(19\alpha - 6\beta)^2$  बराबर है

Options :

3666949225. 16

3666949226. 25

3666949227. 36

3666949228. 49

Question Number : 18 Question Id : 3666942948 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 a bolt factory, machines  $A, B$  and  $C$  manufacture respectively 20%, 30% and 50% of the total bolts. Of their output 3, 4 and 2 percent are respectively defective bolts. A bolt is drawn at random from the product. If the bolt drawn is found the defective, then the probability that it is manufactured by the machine  $C$  is

Options :

3666949229.  $\frac{2}{7}$

3666949230.

$$\frac{5}{14}$$

$$3666949231. \frac{3}{7}$$

$$3666949232. \frac{9}{28}$$

**Question Number : 18 Question Id : 3666942948 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 बोल्ट बनाने के कारखाने में मशीन A, B तथा C कुल उत्पादन का क्रमशः 20%, 30% तथा 50% बोल्ट बनाती है। इन मशीनों के उत्पादन का क्रमशः 3, 4 तथा 2 प्रतिशत बोल्ट खराब हैं। बोल्टों के उत्पादन में से एक बोल्ट यादृच्छया निकाला जाता है। यदि निकाला गया बोल्ट खराब पाया जाता है, तो इसके मशीन C द्वारा बनाए जाने की प्रायिकता है

**Options :**

$$3666949229. \frac{2}{7}$$

$$3666949230. \frac{5}{14}$$

$$3666949231. \frac{3}{7}$$

$$3666949232. \frac{9}{28}$$

Question Number : 19 Question Id : 3666942949 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  $f(x) = \frac{\sin x + \cos x - \sqrt{2}}{\sin x - \cos x}$ ,  $x \in [0, \pi] - \left\{\frac{\pi}{4}\right\}$ . Then  $f\left(\frac{7\pi}{12}\right) f''\left(\frac{7\pi}{12}\right)$  is equal to

Options :

3666949233.  $\frac{-2}{3}$

3666949234.  $\frac{-1}{3\sqrt{3}}$

3666949235.  $\frac{2}{3\sqrt{3}}$

3666949236.  $\frac{2}{9}$

Question Number : 19 Question Id : 3666942949 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  $f(x) = \frac{\sin x + \cos x - \sqrt{2}}{\sin x - \cos x}$ ,  $x \in [0, \pi] - \left\{\frac{\pi}{4}\right\}$  है, तो  $f\left(\frac{7\pi}{12}\right) f''\left(\frac{7\pi}{12}\right)$  बराबर है

Options :

3666949233.

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

3666949234.  $\frac{-1}{3\sqrt{3}}$

3666949235.  $\frac{2}{3\sqrt{3}}$

3666949236.  $\frac{2}{9}$

**Question Number : 20 Question Id : 3666942950 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**

Negation of  $(p \Rightarrow q) \Rightarrow (q \Rightarrow p)$  is

**Options :**

3666949237.  $p \vee (\sim q)$

3666949238.  $(\sim p) \vee q$

3666949239.  $q \wedge (\sim p)$

3666949240.  $(\sim q) \wedge p$

Question Number : 20 Question Id : 3666942950 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

$(p \Rightarrow q) \Rightarrow (q \Rightarrow p)$  का निषेधन है

Options :

3666949237.  $p \vee (\sim q)$

3666949238.  $(\sim p) \vee q$

3666949239.  $q \wedge (\sim p)$

3666949240.  $(\sim q) \wedge p$

## Mathematics Section B

Section Id : 366694161

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 : 366694161

Question Shuffling Allowed : Yes

Is Section Default? : null

Question Number : 21 Question Id : 3666942951 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Let  $A = \{0, 3, 4, 6, 7, 8, 9, 10\}$  and  $R$  be the relation defined on  $A$  such that  $R = \{(x, y) \in A \times A : x - y \text{ is odd positive integer or } x - y = 2\}$ . The minimum number of elements that must be added to the relation  $R$ , so that it is a symmetric relation, 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 : 3666942951 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

माना  $A = \{0, 3, 4, 6, 7, 8, 9, 10\}$  है तथा  $A$  पर एक संबंध  $R$ ,  $R = \{(x, y) \in A \times A : x - y$  विषम घनात्मक पूर्णांक है या  $x - y = 2$  है} द्वारा परिभाषित है। संबंध  $R$  के सममित होने के लिए इसमें कम से कम कितने अवयव जोड़े जाएँ? \_\_\_\_\_.

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 : 3666942952 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  $\leq t$ . If the constant term in the expansion of  $\left(3x^2 - \frac{1}{2x^5}\right)^7$  is  $\alpha$ , then  $[\alpha]$  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 : 22 Question Id : 3666942952 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  $\leq t$  है। यदि  $\left(3x^2 - \frac{1}{2x^5}\right)^7$  के प्रसार में अचर पद  $\alpha$  है,

तो  $[\alpha]$  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 : 23 Question Id : 3666942953 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

If  $a_\alpha$  is the greatest term in the sequence  $a_n = \frac{n^3}{n^4 + 147}$ ,  $n = 1, 2, 3, \dots$ ,  
then  $\alpha$  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 : 23 Question Id : 3666942953 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

यदि अनुक्रम  $a_n = \frac{n^3}{n^4 + 147}$ ,  $n = 1, 2, 3, \dots$  का अधिकतम पद  $a_\alpha$  है, तो  $\alpha$  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 : 24 Question Id : 3666942954 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  $\leq t$ . Then  $\frac{2}{\pi} \int_{\pi/6}^{5\pi/6} (8[\operatorname{cosec} x] - 5[\cot x]) dx$  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 :** 3666942954 **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  $\leq t$  है। तो  $\frac{2}{\pi} \int_{\pi/6}^{5\pi/6} (8[\operatorname{cosec} x] - 5[\cot x]) dx$  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 :** 3666942955 **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 solution curve of the differential equation

$(y - 2\log_e x)dx + (x \log_e x^2)dy = 0, x > 1$  passes through the points  $\left(e, \frac{4}{3}\right)$  and  $(e^4, \alpha)$ , then  $\alpha$  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 :** 25 **Question Id :** 3666942955 **Question Type :** SA **Calculator :** None

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

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

यदि अवकल समीकरण  $(y - 2\log_e x)dx + (x \log_e x^2)dy = 0, x > 1$  का हल वक्र बिंदुओं  $\left(e, \frac{4}{3}\right)$

तथा  $(e^4, \alpha)$  से होकर जाता है, तो  $\alpha$  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 :** 26 **Question Id :** 3666942956 **Question Type :** SA **Calculator :** None

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

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

The largest natural number  $n$  such that  $3^n$  divides  $66!$  is \_\_\_\_\_ .

**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 :** 3666942956 **Question Type :** SA **Calculator :** None

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

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

अधिकतम धनपूर्णांक  $n$ , जिसके लिए  $66!$ ,  $3^n$  से विभाज्य है, 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 :** 3666942957 **Question Type :** SA **Calculator :** None

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

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

Consider a circle  $C_1 : x^2 + y^2 - 4x - 2y = \alpha - 5$ . Let its mirror image in the line  $y = 2x + 1$  be another circle  $C_2 : 5x^2 + 5y^2 - 10fx - 10gy + 36 = 0$ . Let  $r$  be the radius of  $C_2$ . Then  $\alpha + r$  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 : 27 Question Id : 3666942957 Question Type : SA Calculator : None**

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

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

एक वृत्त  $C_1 : x^2 + y^2 - 4x - 2y = \alpha - 5$  का विचार कीजिए। माना रेखा  $y = 2x + 1$  में इसका दर्पण प्रतिबिंब वृत्त  $C_2 : 5x^2 + 5y^2 - 10fx - 10gy + 36 = 0$  है। माना वृत्त  $C_2$  की त्रिज्या  $r$  है। तो  $\alpha + r$  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 : 28 Question Id : 3666942958 Question Type : SA Calculator : None**

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

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

Let  $\lambda_1, \lambda_2$  be the values of  $\lambda$  for which the points  $\left(\frac{5}{2}, 1, \lambda\right)$  and  $(-2, 0, 1)$  are at equal distance from the plane  $2x + 3y - 6z + 7 = 0$ . If  $\lambda_1 > \lambda_2$ , then the distance of the point  $(\lambda_1 - \lambda_2, \lambda_2, \lambda_1)$  from the line  $\frac{x-5}{1} = \frac{y-1}{2} = \frac{z+7}{2}$  is \_\_\_\_\_.

**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 : 3666942958 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

माना  $\lambda$  के मान, जिनके लिए बिंदु  $\left(\frac{5}{2}, 1, \lambda\right)$  तथा  $(-2, 0, 1)$  समतल  $2x + 3y - 6z + 7 = 0$  से समान

दूरी पर हैं,  $\lambda_1, \lambda_2$  हैं। यदि  $\lambda_1 > \lambda_2$  है, तो बिंदु  $(\lambda_1 - \lambda_2, \lambda_2, \lambda_1)$  की रेखा  $\frac{x-5}{1} = \frac{y-1}{2} = \frac{z+7}{2}$  से

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 : 29 Question Id : 3666942959 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

Let  $\vec{a} = 6\hat{i} + 9\hat{j} + 12\hat{k}$ ,  $\vec{b} = \alpha\hat{i} + 11\hat{j} - 2\hat{k}$  and  $\vec{c}$  be vectors such that  $\vec{a} \times \vec{c} = \vec{a} \times \vec{b}$ .

If  $\vec{a} \cdot \vec{c} = -12$ ,  $\vec{c} \cdot (\hat{i} - 2\hat{j} + \hat{k}) = 5$ , then  $\vec{c} \cdot (\hat{i} + \hat{j} + \hat{k})$  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 : 3666942959 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

माना सदिश  $\vec{a} = 6\hat{i} + 9\hat{j} + 12\hat{k}$ ,  $\vec{b} = \alpha\hat{i} + 11\hat{j} - 2\hat{k}$  तथा  $\vec{c}$  इस प्रकार हैं कि  $\vec{a} \times \vec{c} = \vec{a} \times \vec{b}$  है। यदि  $\vec{a} \cdot \vec{c} = -12$ ,  $\vec{c} \cdot (\hat{i} - 2\hat{j} + \hat{k}) = 5$  हैं, तो  $\vec{c} \cdot (\hat{i} + \hat{j} + \hat{k})$  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 : 3666942960 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 mean and variance of 8 numbers  $x, y, 10, 12, 6, 12, 4, 8$  be 9 and 9.25 respectively. If  $x > y$ , then  $3x - 2y$  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 : 3666942960 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

माना 8 संख्याओं  $x, y, 10, 12, 6, 12, 4, 8$  के माध्य तथा प्रसरण क्रमशः 9 तथा 9.25 हैं। यदि  $x > y$  है, तो  $3x - 2y$  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>	366694162
<b>Section Number :</b>	3
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	20
<b>Number of Questions to be attempted :</b>	20
<b>Section Marks :</b>	80
<b>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes
<b>Maximum Instruction Time :</b>	0
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	366694162
<b>Question Shuffling Allowed :</b>	Yes
<b>Is Section Default? :</b>	null

**Question Number : 31 Question Id : 3666942961 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 engine of a train moving with speed  $10 \text{ ms}^{-1}$  towards a platform sounds a whistle at frequency  $400 \text{ Hz}$ . The frequency heard by a passenger inside the train is: (neglect air speed. Speed of sound in air =  $330 \text{ ms}^{-1}$ )

**Options :**

3666949251. 200 Hz

3666949252. 388 Hz

3666949253. 412 Hz

3666949254. 400 Hz

**Question Number : 31 Question Id : 3666942961 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 प्लेटफार्म की ओर  $10 \text{ ms}^{-1}$  की चाल से गतिमान एक रेलगाड़ी का इंजन  $400 \text{ Hz}$  की आवृत्ति से एक सीटी की ध्वनि उत्पन्न करता है। रेलगाड़ी के अन्दर बैठे एक यात्री द्वारा सुनी गयी आवृत्ति है। (वायु की चाल नगण्य मानकर। वायु में ध्वनि की चाल =  $330 \text{ ms}^{-1}$ ):

**Options :**

3666949251. 200 Hz

3666949252. 388 Hz

3666949253. 412 Hz

3666949254. 400 Hz

**Question Number : 32 Question Id : 3666942962 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 air bubble of volume  $1 \text{ cm}^3$  rises from the bottom of a lake 40 m deep to the surface at a temperature of  $12^\circ\text{C}$ . The atmospheric pressure is  $1 \times 10^5 \text{ Pa}$ , the density of water is  $1000 \text{ kg/m}^3$  and  $g = 10 \text{ m/s}^2$ . There is no difference of the temperature of water at the depth of 40 m and on the surface. The volume of air bubble when it reaches the surface will be:

**Options :**

3666949255.  $2 \text{ cm}^3$

3666949256.  $3 \text{ cm}^3$

3666949257.  $4 \text{ cm}^3$

3666949258.  $5 \text{ cm}^3$

**Question Number : 32 Question Id : 3666942962 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**

$12^\circ\text{C}$  तापमान पर 40 m गहरी झील की तली से  $1 \text{ cm}^3$  आयतन का एक वायु का बुलबुला उठता है। वायुमण्डलीय दाब  $1 \times 10^5 \text{ Pa}$ , गुरुत्वीय त्वरण  $10 \text{ m/s}^2$  एवं पानी का घनत्व  $1000 \text{ kg/m}^3$  है। पानी की सतह एवं 40 m की गहराई पर पानी के तापमान में कोई अन्तर नहीं है। जब वायु का बुलबुला सतह पर पहुँचता है तब इसका आयतन होगा:

**Options :**

3666949255.  $2 \text{ cm}^3$

3666949256.  $3 \text{ cm}^3$

3666949257.  $4 \text{ cm}^3$

3666949258.  $5 \text{ cm}^3$

**Question Number : 33 Question Id : 3666942963 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:** If heat is added to a system, its temperature must increase.

**Statement II:** If positive work is done by a system in a thermodynamic process, its volume must increase.

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

**Options :**

3666949259. Both Statement I and Statement II are true

3666949260. Both Statement I and Statement II are false

3666949261. Statement I is true but Statement II is false

3666949262. Statement I is false but Statement II is true

**Question Number : 33 Question Id : 3666942963 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

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

नीचे दो कथन दिये गये हैं:

कथन I: जब निकाय को ऊष्मा दी जाती है, इसका तापमान अवश्य बढ़ना चाहिए।

कथन II: एक ऊष्मा गतिक प्रक्रम में निकाय द्वारा धनात्मक कार्य किया जाता है, इसका आयतन अवश्य बढ़ना चाहिए।

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

**Options :**

3666949259. दोनों कथन I व कथन II सही हैं

3666949260. दोनों कथन I व कथन II गलत हैं

3666949261. कथन I सही है परन्तु कथन II गलत है

3666949262. कथन I गलत है परन्तु कथन II सही है

**Question Number : 34 Question Id : 3666942964 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 aluminium rod with Young's modulus  $Y = 7.0 \times 10^{10} \text{ N/m}^2$  undergoes elastic strain of 0.04%. The energy per unit volume stored in the rod in SI unit is:

**Options :**

3666949263. 2800

3666949264. 5600

3666949265. 8400

3666949266. 11200

**Question Number : 34 Question Id : 3666942964 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**

$Y = 7.0 \times 10^{10} \text{ N/m}^2$  यंग प्रत्यास्थता गुणांक के साथ एक एल्युमिनियम की छड़ 0.04% प्रत्यास्थ विकृति के अन्तर्गत जाती है। प्रति एकांक आयतन में संचित ऊर्जा ( $\text{J/m}^3$  में) है:

**Options :**

3666949263. 2800

3666949264. 5600

3666949265. 8400

3666949266. 11200

**Question Number : 35 Question Id : 3666942965 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:** If  $E$  be the total energy of a satellite moving around the earth, then its potential energy will be  $\frac{E}{2}$ .

**Statement II:** The kinetic energy of a satellite revolving in an orbit is equal to the half the magnitude of total energy  $E$ .

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

**Options :**

3666949267. Both Statement I and Statement II are correct

3666949268. Both Statement I and Statement II are incorrect

3666949269. Statement I is correct but Statement II is incorrect

3666949270. Statement I is incorrect but Statement II is correct

**Question Number : 35 Question Id : 3666942965 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

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

नीचे दो कथन दिये गये हैं:

कथन I: पृथ्वी के परितः घूमते हुए एक उपग्रह की कुल ऊर्जा यदि  $E$  हो, तो इसकी स्थितिज ऊर्जा  $\frac{E}{2}$  होगी।

कथन II: एक कक्षा में घूमते हुए एक उपग्रह की गतिज ऊर्जा कुल ऊर्जा  $E$  के परिमाण के आधे के बराबर होती है।

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

**Options :**

3666949267. दोनों कथन । व कथन ॥ सही हैं

3666949268. दोनों कथन । व कथन ॥ गलत हैं

3666949269. कथन । सही है परन्तु कथन ॥ गलत है

3666949270. कथन । गलत है परन्तु कथन ॥ सही है

**Question Number : 36 Question Id : 3666942966 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**

At any instant the velocity of a particle of mass 500 g is  $(2t\hat{i} + 3t^2\hat{j})$  ms<sup>-1</sup>. If the force acting on the particle at  $t = 1$ s is  $(\hat{i} + x\hat{j})$ N . Then the value of  $x$  will be:

**Options :**

3666949271. 6

3666949272. 4

3666949273. 3

3666949274. 2

**Question Number : 36 Question Id : 3666942966 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**

किस क्षण पर 500 g द्रव्यमान के एक कण का वेग  $(2t\hat{i} + 3t^2\hat{j}) \text{ ms}^{-1}$  है। यदि  $t = 1\text{s}$  पर कण पर आरोपित बल  $(\hat{i} + x\hat{j})\text{N}$  है। तब  $x$  का मान होगा:

**Options :**

3666949271. 6

3666949272. 4

3666949273. 3

3666949274. 2

**Question Number : 37 Question Id : 3666942967 Question Type : MCQ Option Shuffling : Yes Is**

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

**Instruction Time : 0**

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

Two forces having magnitude  $A$  and  $\frac{A}{2}$  are perpendicular to each other. The magnitude of their resultant is:

**Options :**

3666949275.  $\frac{5A}{2}$

3666949276.  $\frac{\sqrt{5}A}{2}$

3666949277.  $\frac{\sqrt{5}A}{4}$



3666949278.  $\frac{\sqrt{5}A^2}{2}$

**Question Number : 37 Question Id : 3666942967 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 व  $\frac{A}{2}$  परिणाम के बल एक-दूसरे के लम्बवत हैं। उनके परिणामी का परिमाण है:

**Options :**

3666949275.  $\frac{5A}{2}$

3666949276.  $\frac{\sqrt{5}A}{2}$

3666949277.  $\frac{\sqrt{5}A}{4}$

3666949278.  $\frac{\sqrt{5}A^2}{2}$

**Question Number : 38 Question Id : 3666942968 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 weight of a body on the earth is 400 N. Then weight of the body when taken to a depth half of the radius of the earth will be:

**Options :**

3666949279. Zero

3666949280. 100 N

3666949281. 200 N

3666949282. 300 N

**Question Number : 38 Question Id : 3666942968 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 पर एक पिण्ड का भार 400 N है। जब पिण्ड को पृथ्वी की त्रिज्या के आधे मान की गहराई पर ले जाया जाता है तब इसका भार होगा:

**Options :**

3666949279. Zero

3666949280. 100 N

3666949281. 200 N

3666949282. 300 N

**Question Number : 39 Question Id : 3666942969 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

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

Two projectiles A and B are thrown with initial velocities of 40 m/s and 60 m/s at angles  $30^\circ$  and  $60^\circ$  with the horizontal respectively. The ratio of their ranges respectively is ( $g = 10 \text{ m/s}^2$ )

**Options :**

3666949283. 1 : 1

3666949284.  $2 : \sqrt{3}$

3666949285. 4 : 9

3666949286.  $\sqrt{3} : 2$

**Question Number : 39 Question Id : 3666942969 Question Type : MCQ Option Shuffling : Yes Is**

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

**Instruction Time : 0**

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

दो प्रक्षेप्य A व B को क्षैतिज से  $30^\circ$  व  $60^\circ$  के कोण पर क्रमशः 40 m/s व 60 m/s वेगों से प्रक्षेपित किया जाता है। उनके क्रमशः परासों का अनुपात है ( $g = 10 \text{ m/s}^2$ ):

**Options :**

3666949283. 1 : 1

3666949284.  $2 : \sqrt{3}$

3666949285. 4 : 9

3666949286.  $\sqrt{3} : 2$

**Question Number : 40 Question Id : 3666942970 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 cylindrical wire of mass  $(0.4 \pm 0.01)$  g has length  $(8 \pm 0.04)$  cm and radius  $(6 \pm 0.03)$  mm. The maximum error in its density will be:

**Options :**

3666949287. 1%

3666949288. 3.5%

3666949289. 4%

3666949290. 5%

**Question Number : 40 Question Id : 3666942970 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**

$(0.4 \pm 0.01)$  g द्रव्यमान के एक बेलनाकार तार की लम्बाई  $(8 \pm 0.04)$  cm एवं त्रिज्या  $(6 \pm 0.03)$  mm है। इसके घनत्व में अधिकतम त्रुटि होगी:

**Options :**

3666949287. 1%

3666949288. 3.5%

3666949289.

4%

3666949290. 5%

**Question Number : 41 Question Id : 3666942971 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 TV transmitting antenna is 98 m high and the receiving antenna is at the ground level. If the radius of the earth is 6400 km, the surface area covered by the transmitting antenna is approximately:

**Options :**

3666949291. 4868 km<sup>2</sup>

3666949292. 1549 km<sup>2</sup>

3666949293. 3942 km<sup>2</sup>

3666949294. 1240 km<sup>2</sup>

**Question Number : 41 Question Id : 3666942971 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 टीवी प्रेषक एंटेना 98 m ऊँचा है एवं ग्राही एंटेना भू-स्तर पर है। यदि पृथ्वी की त्रिज्या 6400 km है, प्रेषक एंटेना द्वारा घेरे गये तल का क्षेत्रफल लगभग है:

**Options :**

3666949291. 4868 km<sup>2</sup>

3666949292. 1549 km<sup>2</sup>

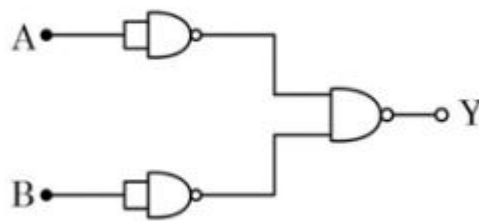
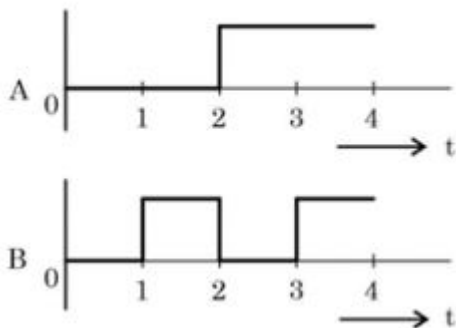
3666949293. 3942 km<sup>2</sup>

3666949294. 1240 km<sup>2</sup>

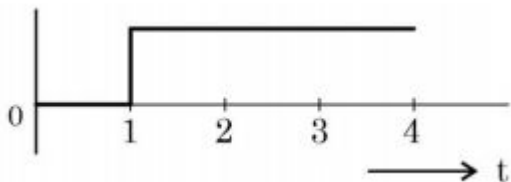
**Question Number : 42 Question Id : 3666942972 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

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

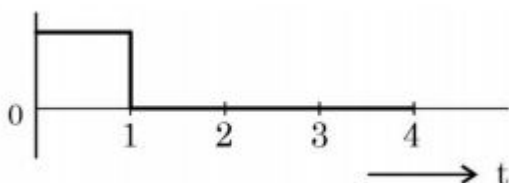
For the logic circuit shown, the output waveform at Y is:



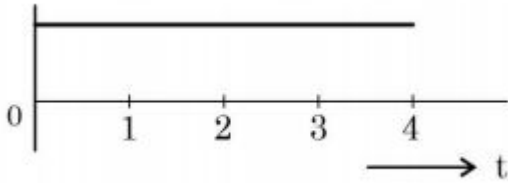
**Options :**



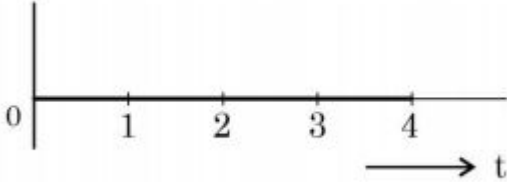
3666949295.



3666949296.



3666949297.

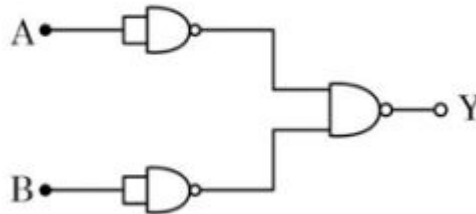
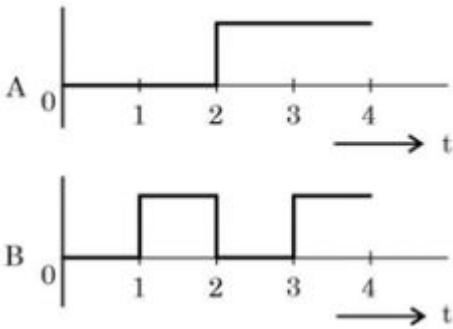


3666949298.

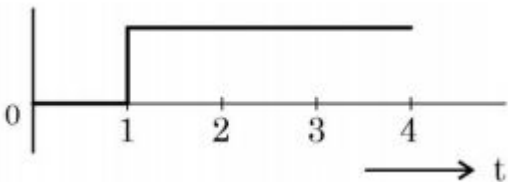
**Question Number : 42 Question Id : 3666942972 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

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

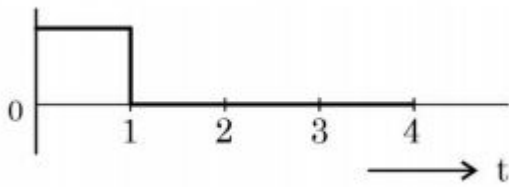
प्रदर्शित तार्किक परिपथ के लिए, Y पर निर्गत तरंग रूप है:



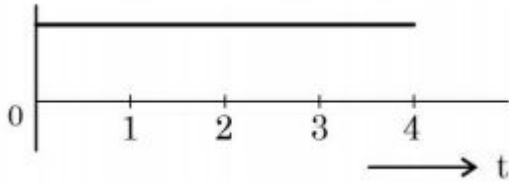
**Options :**



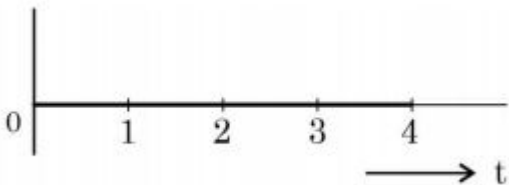
3666949295.



3666949296.



3666949297.



3666949298.

**Question Number : 43 Question Id : 3666942973 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 nucleus  ${}^A_Z X$  having mass number  $A$  and atomic number  $Z$

- A. The surface energy per nucleon  $(b_s) = -a_1 A^{2/3}$ .
- B. The Coulomb contribution to the binding energy  $b_c = -a_2 \frac{Z(Z-1)}{A^{4/3}}$
- C. The volume energy  $b_v = a_3 A$
- D. Decrease in the binding energy is proportional to surface area.
- E. While estimating the surface energy, it is assumed that each nucleon interacts with 12 nucleons. ( $a_1$ ,  $a_2$  and  $a_3$  are constants)

Choose the **most appropriate** answer from the options given below:

**Options :**

3666949299. A, B, C, D only



3666949300. B, C only

3666949301. C, D only

3666949302. B, C, E only

**Question Number : 43 Question Id : 3666942973 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 द्रव्यमान संख्या तथा  $Z$  परमाणु क्रमांक के एक नाभिक  ${}^A_Z X$  के लिए

- A. प्रति न्यूक्लियॉन पृष्ठ ऊर्जा  $(b_s) = -a_1 A^{2/3}$
- B. बन्धन ऊर्जा का कूलॉम्ब भाग  $b_c = -a_2 \frac{Z(Z-1)}{A^{4/3}}$
- C. आयतन ऊर्जा  $b_v = a_3 A$
- D. बन्धन ऊर्जा में कमी पृष्ठ क्षेत्रफल के अनुक्रमानुपाती होती है।
- E. पृष्ठ ऊर्जा निकालने के लिए यह माना जाता है कि प्रत्येक न्यूक्लियॉन 12 न्यूक्लियानों से आकर्षित होता है। ( $a_1$ ,  $a_2$  व  $a_3$  नियतांक हैं)

नीचे दिये गये विकल्पों से अधिकतम उपयुक्त उत्तर चुनिए:

**Options :**

3666949299. केवल A, B, C व D

3666949300. केवल B व C

3666949301. केवल C व D

3666949302. केवल B, C व E

**Question Number : 44 Question Id : 3666942974 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**

Proton (P) and electron (e) will have same de-Broglie wavelength when the ratio of their momentum is (assume,  $m_p = 1849 m_e$ ):

**Options :**

3666949303. 1 : 1849

3666949304. 1 : 43

3666949305. 43 : 1

3666949306. 1 : 1

**Question Number : 44 Question Id : 3666942974 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**

प्रोटान (P) तथा इलैक्ट्रान (e) की डी-ब्रागली तरंगदैर्घ्य एक समान होगी जब इनके संवेगों का अनुपात है ( $m_p = 1849 m_e$  मानकर)।:

**Options :**

3666949303. 1 : 1849

3666949304. 1 : 43

3666949305. 43 : 1

3666949306. 1 : 1

**Question Number : 45 Question Id : 3666942975 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 a reflecting telescope, a secondary mirror is used to:

**Options :**

3666949307. remove spherical aberration

3666949308. move the eyepiece outside the telescopic tube

3666949309. make chromatic aberration zero

3666949310. reduce the problem of mechanical support

**Question Number : 45 Question Id : 3666942975 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 परावर्ती दूरदर्शी में, एक द्वितीय दर्पण का प्रयोग किसके लिए होता है:

**Options :**

3666949307. गोलीय विपथन खत्म करने में

3666949308. नेत्रिका को दूरदर्शी नली से बाहर लाने में

3666949309. वर्ण विपथन शून्य करने में

3666949310. यांत्रिक आधार की समस्या को कम करने में

**Question Number : 46 Question Id : 3666942976 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**

Dimension of  $\frac{1}{\mu_0 \epsilon_0}$  should be equal to

**Options :**

3666949311. L/T

3666949312. T/L

3666949313. L<sup>2</sup>/T<sup>2</sup>

3666949314. T<sup>2</sup>/L<sup>2</sup>

**Question Number : 46 Question Id : 3666942976 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**

$\frac{1}{\mu_0 \epsilon_0}$  की विमा होगी:

**Options :**

3666949311. L/T

3666949312. T/L

3666949313. L<sup>2</sup>/T<sup>2</sup>

3666949314. T<sup>2</sup>/L<sup>2</sup>

**Question Number : 47 Question Id : 3666942977 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**

Certain galvanometers have a fixed core made of non magnetic metallic material. The function of this metallic material is

**Options :**

3666949315. to oscillate the coil in magnetic field for longer period of time

3666949316. to produce large deflecting torque on the coil

3666949317. to make the magnetic field radial

3666949318. to bring the coil to rest quickly

Question Number : 47 Question Id : 3666942977 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

निश्चित धारामापियों में अचुम्बकीय धात्विक पदार्थ का बना एक दृढ़ क्रोड होता है। इस धात्विक पदार्थ का कार्य है:

Options :

3666949315. चुम्बकीय क्षेत्र में कुण्डली को अधिक आवर्त काल के दोलन करने में

3666949316. कुण्डली पर अधिक विक्षेप बल आघूर्ण उत्पन्न करने में

3666949317. चुम्बकीय क्षेत्र को त्रिज्य बनाने में

3666949318. कुण्डली को तेजी से विराम में लाने में

Question Number : 48 Question Id : 3666942978 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 charge particle moving in magnetic field B, has the components of velocity along B as well as perpendicular to B. The path of the charge particle will be

Options :

3666949319. straight along the direction of magnetic field B

3666949320. circular path

3666949321. helical path with the axis along magnetic field B

helical path with the axis perpendicular to the direction of magnetic field B

3666949322.

**Question Number : 48 Question Id : 3666942978 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**

चुम्बकीय क्षेत्र B में गतिमान एक आवेशित कण के वेग के घटक, B के अनुदिश और B के लम्बवत हैं। आवेशित कण का पथ होगा:

**Options :**

3666949319. चुम्बकीय क्षेत्र B की दिशा के अनुदिश सरल रेखीय

3666949320. वृत्ताकार

3666949321. चुम्बकीय क्षेत्र B के अनुदिश अक्ष का हेलिकल

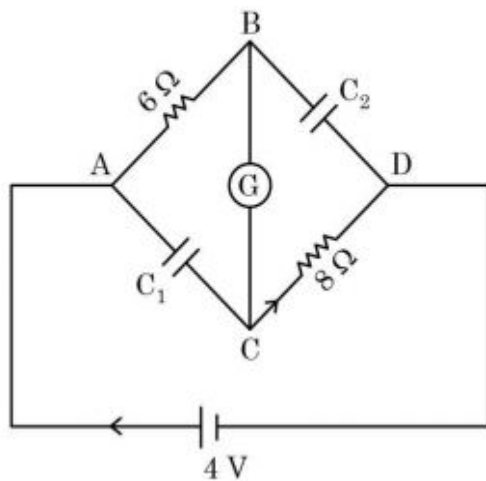
3666949322. चुम्बकीय क्षेत्र B की दिशा के लम्बवत अक्ष का हेलिकल

**Question Number : 49 Question Id : 3666942979 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 this figure the resistance of the coil of galvanometer G is  $2\ \Omega$ . The emf of the cell is  $4\ \text{V}$ . The ratio of potential difference across  $C_1$  and  $C_2$  is:



Options :

3666949323.  $\frac{4}{5}$

3666949324.  $1$

3666949325.  $\frac{5}{4}$

3666949326.  $\frac{3}{4}$

Question Number : 49 Question Id : 3666942979 Question Type : MCQ Option Shuffling : Yes Is

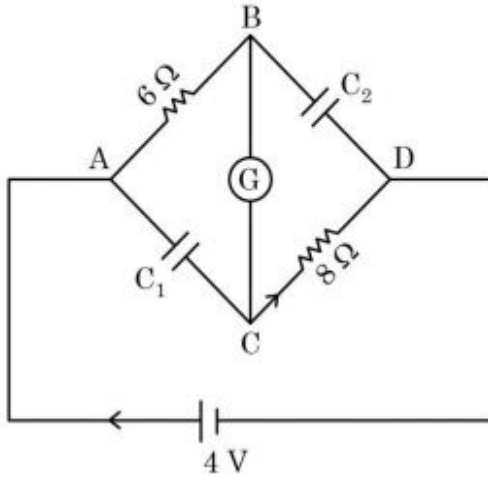
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1



इस चित्र में धारामापी G की कुण्डली का प्रतिरोध  $2\ \Omega$  है। सेल का विद्युत वाहक बल 4 V है।  $C_1$  व  $C_2$  विभवान्तरों का अनुपात है:



Options :

3666949323.  $\frac{4}{5}$

3666949324. 1

3666949325.  $\frac{5}{4}$

3666949326.  $\frac{3}{4}$

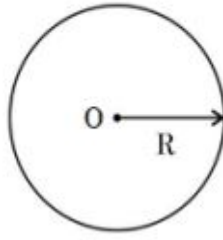
Question Number : 50 Question Id : 3666942980 Question Type : MCQ Option Shuffling : Yes Is

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

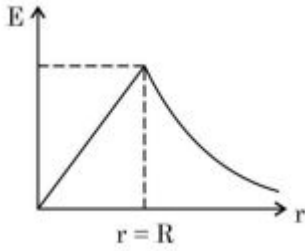
Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

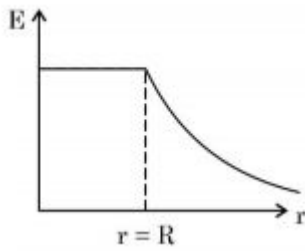
Graphical variation of electric field due to a uniformly charged insulating solid sphere of radius  $R$ , with distance  $r$  from the centre  $O$  is represented by:



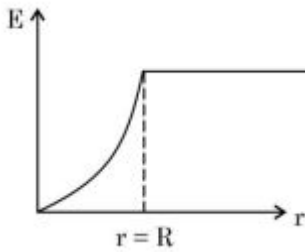
Options :



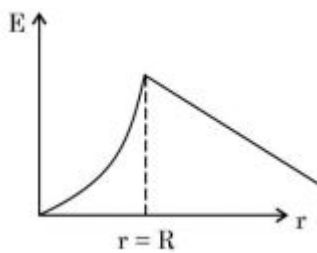
3666949327.



3666949328.



3666949329.



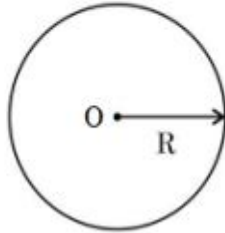
3666949330.

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

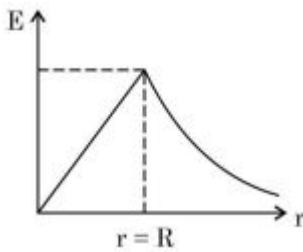
**Instruction Time : 0**

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

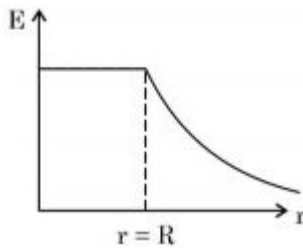
एक एकसमान आवेशित अचालक ठोस गोले के कारण विभिन्न स्थानों पर वैद्युत क्षेत्र का अभिरेखीय परिवर्तन निम्न प्रकार प्रदर्शित है:



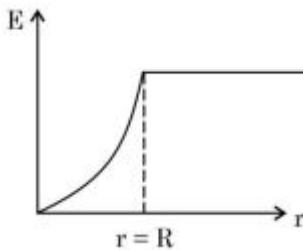
**Options :**



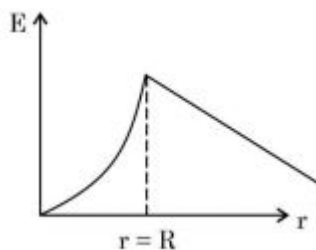
3666949327.



3666949328.



3666949329.



3666949330.

## Physics Section B

Section Id :	366694163
Section Number :	4
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Enable Mark as Answered Mark for Review and Clear Response :	Yes
Maximum Instruction Time :	0
Sub-Section Number :	1
Sub-Section Id :	366694163
Question Shuffling Allowed :	Yes
Is Section Default? :	null

**Question Number : 51 Question Id : 3666942981 Question Type : SA Calculator : None**

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

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

An organ pipe 40 cm long is open at both ends. The speed of sound in air is  $360 \text{ ms}^{-1}$ . The frequency of the second harmonic is \_\_\_\_\_ Hz.

**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 : 3666942981 Question Type : SA Calculator : None**

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

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

एक 40 cm लम्बा आर्गन पाइप दोनों सिरों पर खुला हुआ है। वायु में ध्वनि की चाल  $360 \text{ ms}^{-1}$  है।  
द्वितीय संनाद की आवृत्ति \_\_\_\_\_ Hz है।

**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 : 3666942982 Question Type : SA Calculator : None**

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

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

An air bubble of diameter 6 mm rises steadily through a solution of density  $1750 \text{ kg/m}^3$  at the rate of 0.35 cm/s. The co-efficient of viscosity of the solution (neglect density of air) is \_\_\_\_\_ Pas (given,  $g = 10 \text{ ms}^{-2}$ ).

**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 : 3666942982 Question Type : SA Calculator : None**

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

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

1750 kg/m<sup>3</sup> घनत्व के एक घोल में 6 mm व्यास का एक वायु का बुलबुला 0.35 cm/s की स्थाई दर से उठता है। घोल का श्यानता गुणांक \_\_\_\_\_ Pas है ( वायु का घनत्व नगण्य मानकर एवं दिया है,  $g = 10 \text{ ms}^{-2}$ )

**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 : 3666942983 Question Type : SA Calculator : None**

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

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

The moment of inertia of a semicircular ring about an axis, passing through the center and perpendicular to the plane of ring, is  $\frac{1}{x}MR^2$ , where R is the radius and M is the mass of the semicircular ring. The value of x 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 : 53 Question Id : 3666942983 Question Type : SA Calculator : None**

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

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

एक अर्धवृत्ताकार छल्ले का एक अक्ष के परितः जड़त्व आघूर्ण  $\frac{1}{x}MR^2$  है जो छल्ले के तल के लम्बवत एवं इसके केन्द्र से गुजरती है। जहाँ M अर्धवृत्ताकार छल्ले का द्रव्यमान तथा R त्रिज्या है।  $x$  का मान \_\_\_\_\_ होगा।

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 54 **Question Id :** 3666942984 **Question Type :** SA **Calculator :** None

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

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

The momentum of a body is increased by 50%. The percentage increase in the kinetic energy of the body is \_\_\_\_\_ %.

**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 :** 3666942984 **Question Type :** SA **Calculator :** None

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

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

एक पिण्ड का संवेग 50% बढ़ जाता है। पिण्ड की गतिज ऊर्जा में प्रतिशत वृद्धि \_\_\_\_\_ % 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 :** 3666942985 **Question Type :** SA **Calculator :** None

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

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

A nucleus with mass number 242 and binding energy per nucleon as 7.6 MeV breaks into two fragment each with mass number 121. If each fragment nucleus has binding energy per nucleon as 8.1 MeV, the total gain in binding energy is \_\_\_\_\_ MeV.

**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 :** 3666942985 **Question Type :** SA **Calculator :** None

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

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

242 द्रव्यमान संख्या एवं प्रति न्यूक्लियॉन बन्धन ऊर्जा 7.6 MeV का एक नाभिक एक समान द्रव्यमान संख्या 121 के दो छोटे-2 खण्डों में टूट जाता है। यदि प्रत्येक खण्ड नाभिक की प्रति न्यूक्लियॉन बन्धन ऊर्जा 8.1 MeV हो, बन्धन ऊर्जा में कुल वृद्धि \_\_\_\_\_ MeV है।

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal



**Text Areas :** PlainText

**Possible Answers :**

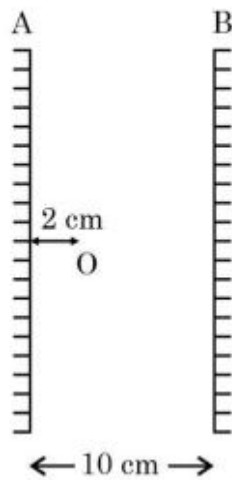
10

**Question Number :** 56 **Question Id :** 3666942986 **Question Type :** SA **Calculator :** None

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

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

Two vertical parallel mirrors A and B are separated by 10 cm. A point object O is placed at a distance of 2 cm from mirror A. The distance of the second nearest image behind mirror A from the mirror A is \_\_\_\_\_ cm.



**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

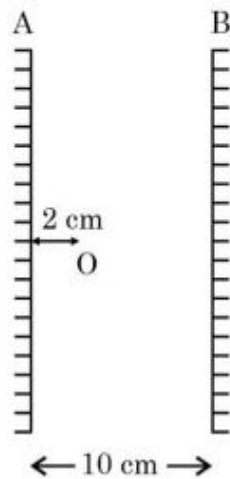
10

**Question Number :** 56 **Question Id :** 3666942986 **Question Type :** SA **Calculator :** None

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

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

दो ऊर्ध्वाधर समान्तर दर्पण A व B एक दूसरे से 10 cm की दूरी पर स्थित हैं। दर्पण A से 2 cm की दूरी पर एक बिन्दु वस्तु O स्थित है। दर्पण A के पीछे द्वितीय निकटतम प्रतिबिम्ब की दर्पण A से दूरी \_\_\_\_\_ cm 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 :** 3666942987 **Question Type :** SA **Calculator :** None

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

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

An oscillating LC circuit consists of a 75 mH inductor and a  $1.2 \mu\text{F}$  capacitor. If the maximum charge to the capacitor is  $2.7 \mu\text{C}$ . The maximum current in the circuit will be \_\_\_\_\_ mA.

**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 : 3666942987 Question Type : SA Calculator : None**

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

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

एक दोलन करते हुए LC परिपथ में 75 mH का एक प्रेरक एवं एक 1.2  $\mu\text{F}$  का एक संधारित्र लगा है। यदि संधारित्र पर कुल आवेश 2.7  $\mu\text{C}$  है। परिपथ में अधिकतम धारा \_\_\_\_\_ mA होगी।

**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 : 3666942988 Question Type : SA Calculator : None**

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

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

The magnetic intensity at the center of a long current carrying solenoid is found to be  $1.6 \times 10^3 \text{ Am}^{-1}$ . If the number of turns is 8 per cm, then the current flowing through the solenoid is \_\_\_\_\_ A.

**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 : 3666942988 Question Type : SA Calculator : None**

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

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

एक लम्बी धारावाही परिनालिका के केन्द्र पर चुम्बकीय क्षेत्र की तीव्रता  $1.6 \times 10^3 \text{ Am}^{-1}$  प्राप्त होती है। यदि प्रति से.मी. फेरों की संख्या 8 हो, तो परिनालिका में प्रवाहित धारा \_\_\_\_\_ A है।

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

**Question Number : 59 Question Id : 3666942989 Question Type : SA Calculator : None**

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

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

A current of 2 A flows through a wire of cross-sectional area  $25.0 \text{ mm}^2$ . The number of free electrons in a cubic meter are  $2.0 \times 10^{28}$ . The drift velocity of the electrons is \_\_\_\_\_  $\times 10^{-6} \text{ ms}^{-1}$  (given, charge on electron =  $1.6 \times 10^{-19} \text{ C}$ ).

**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 : 3666942989 Question Type : SA Calculator : None**

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

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

25.0 mm<sup>2</sup> के अनुपृस्थ परिच्छेद क्षेत्रफल के एकतार में 2A की एक धारा प्रवाहित होती है। एक घन मीटर में मुक्त इलैक्ट्रानों की संख्या  $2.0 \times 10^{28}$  है। इलैक्ट्रानों का अनुगमन वेग \_\_\_\_\_  $\times 10^{-6}$  ms<sup>-1</sup> है (दिया है, इलैक्ट्रान पर आवेश =  $1.6 \times 10^{-19}$  C)।

**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 :** 3666942990 **Question Type :** SA **Calculator :** None

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

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

An electric dipole of dipole moment is  $6.0 \times 10^{-6}$  C m placed in a uniform electric field of  $1.5 \times 10^3$  NC<sup>-1</sup> in such a way that dipole moment is along electric field. The work done in rotating dipole by 180° in this field will be \_\_\_\_\_ mJ.

**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 :** 3666942990 **Question Type :** SA **Calculator :** None

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

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

$6.0 \times 10^{-6} \text{ C m}$  द्विध्रुव आघूर्ण का एक विद्युत द्विध्रुव  $1.5 \times 10^3 \text{ NC}^{-1}$  के एक एकसमान विद्युत क्षेत्र में इस प्रकार रखा है कि द्विध्रुव आघूर्ण विद्युत क्षेत्र के अनुदिश है। इस क्षेत्र में द्विध्रुव को  $180^\circ$  द्वारा घुमाने में कृत कार्य \_\_\_\_\_ mJ होगा।

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

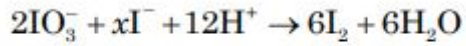
## Chemistry Section A

<b>Section Id :</b>	366694164
<b>Section Number :</b>	5
<b>Section type :</b>	Online
<b>Mandatory or Optional :</b>	Mandatory
<b>Number of Questions :</b>	20
<b>Number of Questions to be attempted :</b>	20
<b>Section Marks :</b>	80
<b>Enable Mark as Answered Mark for Review and Clear Response :</b>	Yes
<b>Maximum Instruction Time :</b>	0
<b>Sub-Section Number :</b>	1
<b>Sub-Section Id :</b>	366694164
<b>Question Shuffling Allowed :</b>	Yes
<b>Is Section Default? :</b>	null

**Question Number :** 61 **Question Id :** 3666942991 **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**



What is the value of  $x$ ?

**Options :**

3666949341. 2

3666949342. 10

3666949343. 6

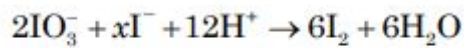
3666949344. 12

**Question Number : 61 Question Id : 3666942991 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**



$x$  का मान क्या है?

**Options :**

3666949341. 2

3666949342. 10

3666949343. 6

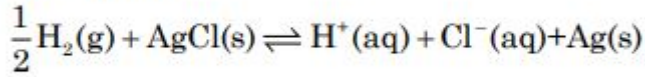
3666949344. 12



Question Number : 62 Question Id : 3666942992 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 reaction



occurs in which of the given galvanic cell.

Options :

3666949345.  $\text{Ag} | \text{AgCl}(\text{s}) | \text{KCl}(\text{sol}^n) | \text{AgNO}_3 | \text{Ag}$

3666949346.  $\text{Pt} | \text{H}_2(\text{g}) | \text{HCl}(\text{sol}^n) | \text{AgNO}_3(\text{sol}^n) | \text{Ag}$

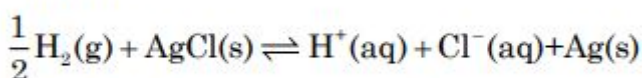
3666949347.  $\text{Pt} | \text{H}_2(\text{g}) | \text{HCl}(\text{sol}^n) | \text{AgCl}(\text{s}) | \text{Ag}$

3666949348.  $\text{Pt} | \text{H}_2(\text{g}) | \text{KCl}(\text{sol}^n) | \text{AgCl}(\text{s}) | \text{Ag}$

Question Number : 62 Question Id : 3666942992 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

अभिक्रिया



दिये गये किस गैल्वानिक सेल में होगी

Options :

3666949345.  $\text{Ag} | \text{AgCl}(\text{s}) | \text{KCl}(\text{sol}^n) | \text{AgNO}_3 | \text{Ag}$



3666949346.  $\text{Pt} | \text{H}_2(\text{g}) | \text{HCl}(\text{sol}^n) | \text{AgNO}_3(\text{sol}^n) | \text{Ag}$

3666949347.  $\text{Pt} | \text{H}_2(\text{g}) | \text{HCl}(\text{sol}^n) | \text{AgCl}(\text{s}) | \text{Ag}$

3666949348.  $\text{Pt} | \text{H}_2(\text{g}) | \text{KCl}(\text{sol}^n) | \text{AgCl}(\text{s}) | \text{Ag}$

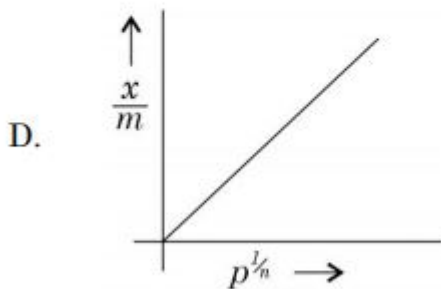
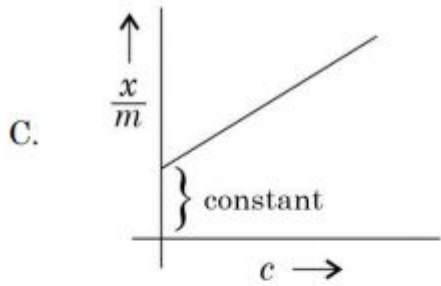
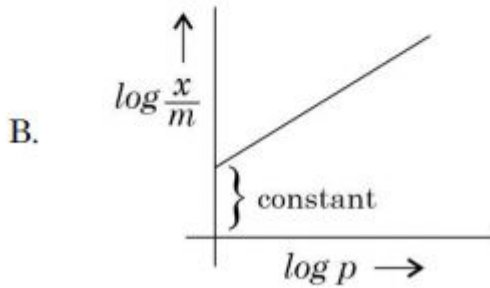
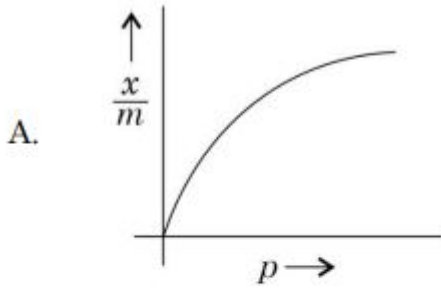
**Question Number : 63 Question Id : 3666942993 Question Type : MCQ Option Shuffling : Yes Is**

**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 represent the Freundlich adsorption isotherms?



Choose the correct answer from the options given below:

**Options :**

3666949349. A, B only

3666949350. B, C, D only

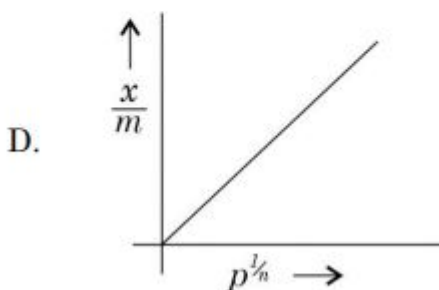
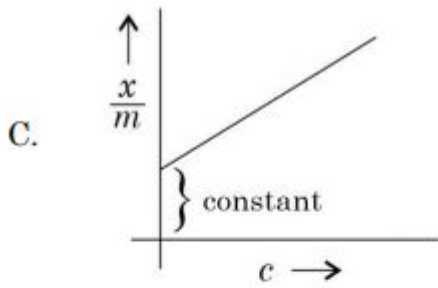
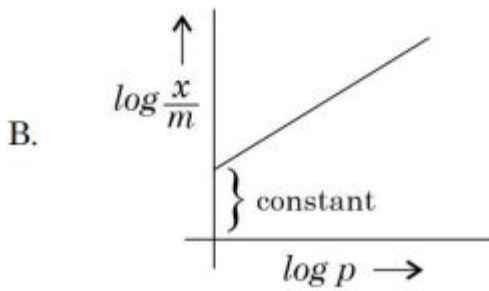
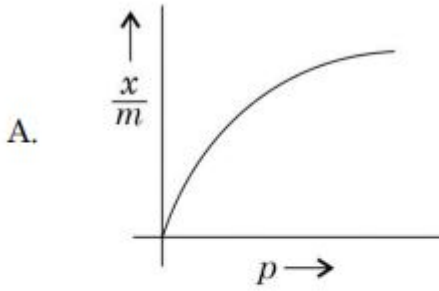
3666949351. A, B, D only

3666949352. A, C, D only

Question Number : 63 Question Id : 3666942993 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित में से कौन सा फ्रॉयन्डलिक अधिशोषण समतापी को प्रदर्शित करता है?



नीचे दिये गये विकल्पों में से सही विकल्प को चुनें:

Options :

3666949349. केवल A और B

3666949350. केवल B, C और D

3666949351. केवल A, B और D

3666949352. केवल A, C और D

**Question Number : 64 Question Id : 3666942994 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 electronegativity for given elements is:

**Options :**

3666949353.  $C > P > At > Br$

3666949354.  $Br > C > At > P$

3666949355.  $P > Br > C > At$

3666949356.  $Br > P > At > C$

**Question Number : 64 Question Id : 3666942994 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**

दिये गये तत्वों की विद्युत ऋणात्मकता का सही क्रम है:

**Options :**

3666949353.  $C > P > At > Br$

3666949354.  $Br > C > At > P$

3666949355.  $P > Br > C > At$

3666949356.  $Br > P > At > C$

**Question Number : 65 Question Id : 3666942995 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 metals can be extracted through alkali leaching technique?

**Options :**

3666949357. Au

3666949358. Cu

3666949359. Pb

3666949360. Sn

**Question Number : 65 Question Id : 3666942995 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

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

निम्नलिखित में से कौन सी धातु धारीय निक्षालन विधि से निष्कार्षित की जा सकती है

**Options :**

3666949357. Au

3666949358. Cu

3666949359. Pb

3666949360. Sn

**Question Number : 66 Question Id : 3666942996 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 water gas on reacting with cobalt as a catalyst forms

**Options :**

3666949361. Methanal

3666949362. Methanol

3666949363. Methanoic acid

3666949364. Ethanol

**Question Number : 66 Question Id : 3666942996 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**

जल गैस कोबाल्ट उत्प्रेरक से अभिक्रिया करके बनाती है:

**Options :**

3666949361. मेथेनॉल

3666949362. मेथेनल

3666949363. मेथेनोइक अम्ल

3666949364. एथेनॉल

**Question Number : 67 Question Id : 3666942997 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**

What is the purpose of adding gypsum to cement?

**Options :**

3666949365. To give a hard mass

3666949366. To facilitate the hydration of cement

3666949367. To slow down the process of setting

3666949368. To speed up the process of setting

**Question Number : 67 Question Id : 3666942997 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

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

सीमेन्ट में जिप्सम को डालने का क्या उद्देश्य है?

**Options :**

3666949365. कठोर द्रव्य देने के लिए

3666949366. सीमेन्ट के जलीकरण को सुगम बनाने के लिए

3666949367. जमने के प्रक्रम को धीमा करने के लिए

3666949368. जमने के प्रक्रम को तेज करने के लिए

**Question Number : 68 Question Id : 3666942998 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:** Lithium and Magnesium do not form superoxide

**Statement II:** The ionic radius of  $\text{Li}^+$  is larger than ionic radius of  $\text{Mg}^{2+}$

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

**Options :**

3666949369. Both Statement I and Statement II are correct



3666949370. Both Statement I and Statement II are incorrect

3666949371. Statement I is correct but Statement II is incorrect

3666949372. Statement I is incorrect but Statement II is correct

**Question Number : 68 Question Id : 3666942998 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: लिथियम और मैग्नेशियम सुपरऑक्साइड नहीं बनाते हैं।

कथन II:  $Li^+$  की आयनिक त्रिज्या  $Mg^{2+}$  से अधिक होती है

उपरोक्त कथनों के सन्दर्भ निचे दिये गये विकल्पों में से सबसे उचित उत्तर को चुने :

**Options :**

3666949369. कथन I और II दोनों सत्य हैं

3666949370. कथन I और II दोनों असत्य हैं

3666949371. कथन I सत्य है परन्तु कथन II असत्य हैं

3666949372. कथन I असत्य है परन्तु कथन II सत्य हैं

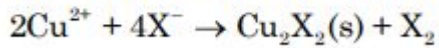
**Question Number : 69 Question Id : 3666942999 Question Type : MCQ Option Shuffling : Yes Is**

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

**Instruction Time : 0**

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

Which halogen is known to cause the reaction given below:



**Options :**

3666949373. All halogens

3666949374. Only Iodine

3666949375. Only Bromine

3666949376. Only Chlorine

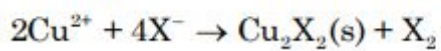
**Question Number : 69 Question Id : 3666942999 Question Type : MCQ Option Shuffling : Yes Is**

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

**Instruction Time : 0**

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

कौन सा हैलोजन नीचे दी गई अभिक्रिया को देगा:



**Options :**

3666949373. सभी हैलोजन

3666949374. केवल आयोडीन

3666949375. केवल ब्रोमीन

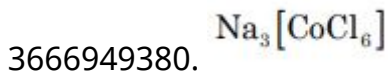
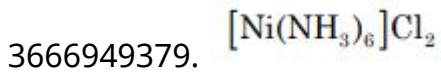
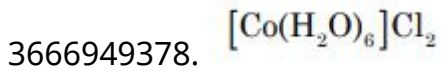
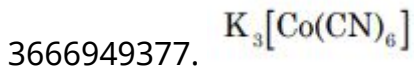
3666949376. केवल क्लोरीन

**Question Number : 70 Question Id : 3666943000 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 complex is octahedral, diamagnetic and the most stable?

**Options :**

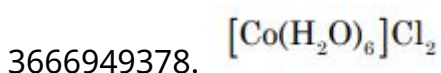
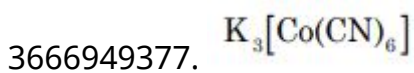


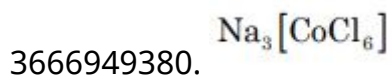
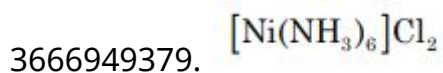
**Question Number : 70 Question Id : 3666943000 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

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

निम्नलिखित में से कौन सा संकुल अष्टफलकीय प्रतिचुंबकीय और सर्वाधिक स्थाई है?

**Options :**





Question Number : 71 Question Id : 3666943001 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 (Species)	List II (Maximum allowed concentration in ppm in drinking water)
A. $\text{F}^-$	I. < 50 ppm
B. $\text{SO}_4^{2-}$	II. < 5 ppm
C. $\text{NO}_3^-$	III. < 2 ppm
D. Zn	IV. < 500 ppm

Choose the *correct* answer from the options given below:

Options :

3666949381. A-I, B-II, C-III, D-IV

3666949382. A-IV, B-III, C-II, D-I

3666949383. A-II, B-I, C-III, D-IV

3666949384. A-III, B-II, C-I, D-IV

Question Number : 71 Question Id : 3666943001 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

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

सूची I को II से सुमेलित करे:

सूची-I (जातियाँ)	सूची-II (पीने वाले जल में अधिकतम निर्धारित सान्द्रता ppm में)
A. $F^-$	I. $< 50$ ppm
B. $SO_4^{2-}$	II. $< 5$ ppm
C. $NO_3^-$	III. $< 2$ ppm
D. Zn	IV. $< 500$ ppm

नीचे दिये गये विकल्पों से सही उत्तर को चुने:

**Options :**

3666949381. A-I, B-II, C-III, D-IV

3666949382. A-IV, B-III, C-II, D-I

3666949383. A-II, B-I, C-III, D-IV

3666949384. A-III, B-II, C-I, D-IV

**Question Number : 72 Question Id : 3666943002 Question Type : MCQ Option Shuffling : Yes Is**

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

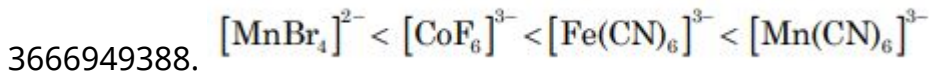
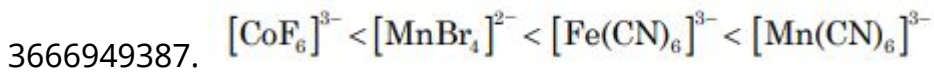
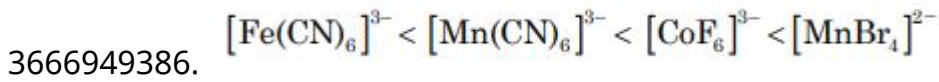
**Instruction Time : 0**

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

The correct order of spin only magnetic moments for the following complex ions is

**Options :**

3666949385.  $[Fe(CN)_6]^{3-} < [CoF_6]^{3-} < [MnBr_4]^{2-} < [Mn(CN)_6]^{3-}$

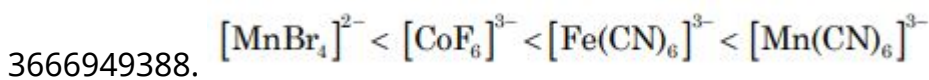
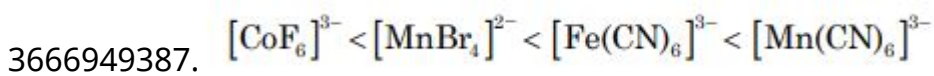
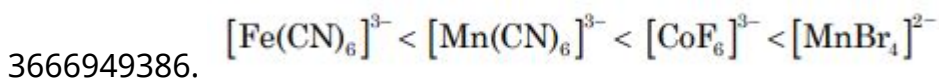


**Question Number : 72 Question Id : 3666943002 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

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

निम्नलिखित संकुल आयनों के लिए केवल प्रचक्रण चुम्बकीय आघूर्ण का सही क्रम है:

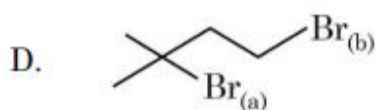
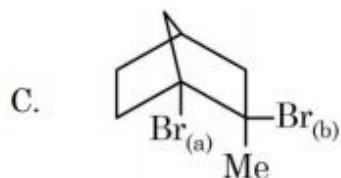
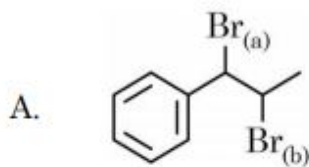
**Options :**



**Question Number : 73 Question Id : 3666943003 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**

Choose the halogen which is most reactive towards  $S_N1$  reaction in the given compounds (A, B, C & D)



Options :

3666949389. A - Br<sub>(a)</sub> ; B - I<sub>(a)</sub> ; C - Br<sub>(b)</sub> ; D - Br<sub>(a)</sub>

3666949390. A - Br<sub>(a)</sub> ; B - I<sub>(a)</sub> ; C - Br<sub>(a)</sub> ; D - Br<sub>(a)</sub>

3666949391. A - Br<sub>(b)</sub> ; B - I<sub>(a)</sub> ; C - Br<sub>(a)</sub> ; D - Br<sub>(a)</sub>

3666949392. A - Br<sub>(b)</sub> ; B - I<sub>(b)</sub> ; C - Br<sub>(b)</sub> ; D - Br<sub>(b)</sub>

Question Number : 73 Question Id : 3666943003 Question Type : MCQ Option Shuffling : Yes Is

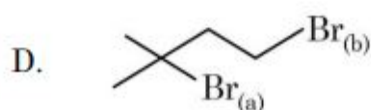
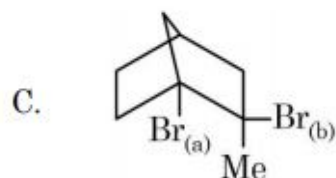
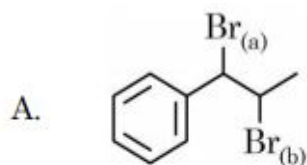
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1



दिये गये यौगिकों (A, B, C & D) के लिए हैलोजन को चुनें जोंकी  $S_N1$  अभिक्रिया के लिए सर्वाधिक क्रियाशील है।



Options :

3666949389. A - Br<sub>(a)</sub> ; B - I<sub>(a)</sub> ; C - Br<sub>(b)</sub> ; D - Br<sub>(a)</sub>

3666949390. A - Br<sub>(a)</sub> ; B - I<sub>(a)</sub> ; C - Br<sub>(a)</sub> ; D - Br<sub>(a)</sub>

3666949391. A - Br<sub>(b)</sub> ; B - I<sub>(a)</sub> ; C - Br<sub>(a)</sub> ; D - Br<sub>(a)</sub>

3666949392. A - Br<sub>(b)</sub> ; B - I<sub>(b)</sub> ; C - Br<sub>(b)</sub> ; D - Br<sub>(b)</sub>

Question Number : 74 Question Id : 3666943004 Question Type : MCQ Option Shuffling : Yes Is

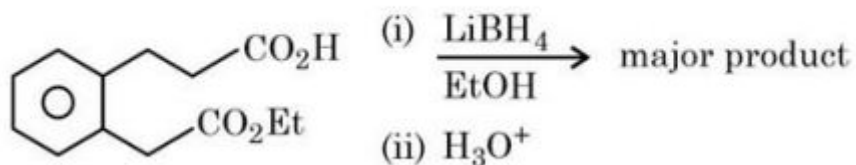
Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum

Instruction Time : 0

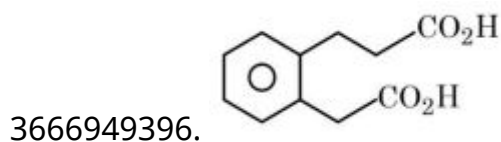
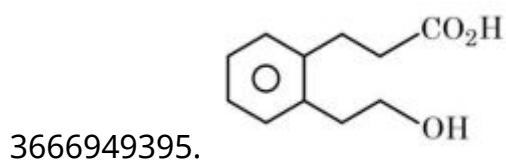
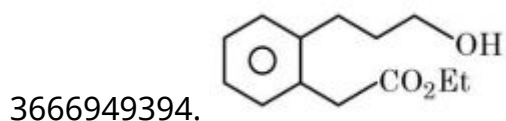
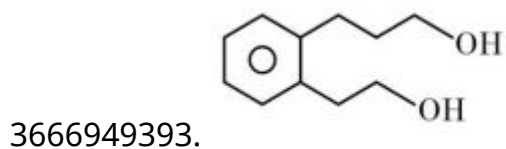
Correct Marks : 4 Wrong Marks : 1



The major product formed in the following reaction is:



Options :



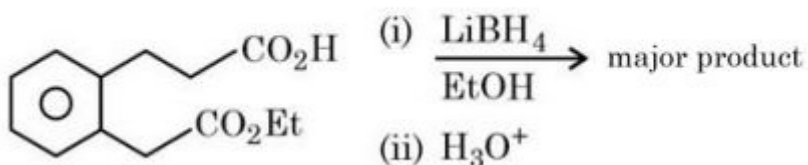
Question Number : 74 Question Id : 3666943004 Question Type : MCQ Option Shuffling : Yes Is

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

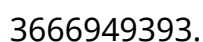
Instruction Time : 0

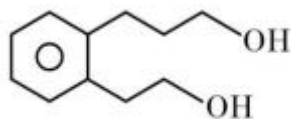
Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया में बना प्रमुख उत्पाद हैं?

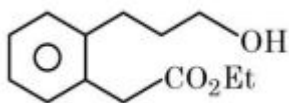


Options :

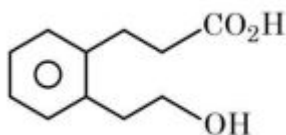




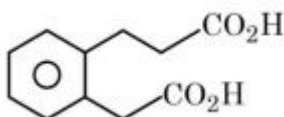
3666949394.



3666949395.



3666949396.



**Question Number : 75 Question Id : 3666943005 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: Butan -1- ol has higher boiling point than ethoxyethane.

Reason R: Extensive hydrogen bonding leads to stronger association of molecules.

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

**Options :**

3666949397. Both A and R are true and R is the correct explanation of A

3666949398. Both A and R are true but R is not the correct explanation of A

3666949399. A is true but R is false

3666949400. A is false but R is true

**Question Number : 75 Question Id : 3666943005 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

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

नीचे दो कथन दिये गये हैं एक को अभिकथन A और दूसरे को कारण R चिह्नित किया गया है  
अभिकथन A : ब्यूटेन-1 ऑल का क्रांति एथोक्सीएथेन से अधिक होता है।  
कारण R : अत्यधिक हायड्रोजन आबंधन के कारण अणुओं का संगठन मजबूत हो जाता है।  
उपरोक्त कथनों के आधार पर नीचे दिये गये विकल्पों में से सही विकल्प को चुनें :

**Options :**

3666949397. A और R दोनों सही हैं और R, A की सही व्याख्या है।

3666949398. A और R दोनों सही हैं परन्तु R, A की सही व्याख्या नहीं है।

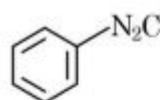
3666949399. A सही है परन्तु R गलत है।

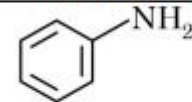
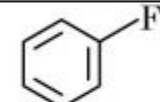
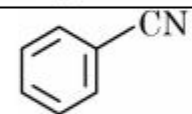
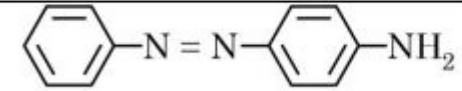
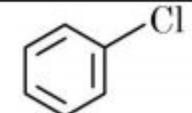
3666949400. A गलत है परन्तु R सही है।

**Question Number : 76 Question Id : 3666943006 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:

 is reacted with reagents in List I to form products in List II.

List I (Reagent)	List II (Product)
A. 	I. 
B. $\text{HBF}_4, \Delta$	II. 
C. $\text{Cu, HCl}$	III. 
D. $\text{CuCN / KCN}$	IV. 

Choose the **correct** answer from the options given below:

**Options :**

3666949401. A-IV, B-III, C-II, D-I

3666949402. A-III, B-I, C-IV, D-II

3666949403. A-I, B-III, C-IV, D-II

3666949404. A-III, B-I, C-II, D-IV

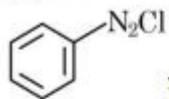
Question Number : 76 Question Id : 3666943006 Question Type : MCQ Option Shuffling : Yes Is

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

Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

सूची I को II से सुमेलित करे:



सूची I को अभिकर्मक से अभिक्रिया करके सूची II का उत्पाद देता है।

सूची -I अभिकर्मक	सूची -II उत्पाद
A.	I.
B. $\text{HBF}_4, \Delta$	II.
C. $\text{Cu, HCl}$	III.
D. $\text{CuCN / KCN}$	IV.

नीचे दिये गये विकल्पों में से सही उत्तर को चुनें.

**Options :**

3666949401. A-IV, B-III, C-II, D-I

3666949402. A-III, B-I, C-IV, D-II

3666949403. A-I, B-III, C-IV, D-II

3666949404. A-III, B-I, C-II, D-IV

Question Number : 77 Question Id : 3666943007 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

Sulphur (S) containing amino acids from the following are:

(a) isoleucine (b) cysteine (c) lysine (d) methionine (e) glutamic acid

**Options :**

3666949405. a, b, c

3666949406. b, d

3666949407. b, c, e

3666949408. a, d

**Question Number : 77 Question Id : 3666943007 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

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

निम्नलिखित में से सल्फरयुक्त ऐमीनो अम्ल है:

(a) आइसोल्यूसीन (b) सिस्टीन (c) लाइसीन (d) मैथाइओनीन (e) ग्लूटैमिक अम्ल

**Options :**

3666949405. a, b, c

3666949406. b, d

3666949407. b, c, e

3666949408. a, d

**Question Number : 78 Question Id : 3666943008 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. Saccharin	I. High potency sweetener
B. Aspartame	II. First artificial sweetening agent
C. Alitame	III. Stable at cooking temperature
D. Sucralose	IV. Unstable at cooking temperature

Choose the **correct** answer from the options given below:

**Options :**

3666949409. A-II, B-IV, C-I, D-III

3666949410. A-II, B-IV, C-III, D-I

3666949411. A-II, B-III, C-IV, D-I

3666949412. A-IV, B-III, C-I, D-II

**Question Number : 78 Question Id : 3666943008 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0**

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

सूची I को II से सुमेलित करें

सूची -I	सूची - II
A. सैकरीन	I. अधिक प्रबल मधुरक
B. ऐस्पार्टेम	II. पहला कृत्रिम मधुरक
C. ऐलिटेम	III. खाना पकाने के तापमान पर स्थाई
D. सुक्रालोस	IV. खाना पकाने के तापमान पर अस्थायी

नीचे दिये गये विकल्पों से सही उत्तर को चुनें:

**Options :**

3666949409. A-II, B-IV, C-I, D-III

3666949410. A-II, B-IV, C-III, D-I

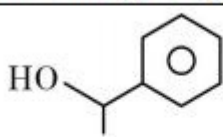

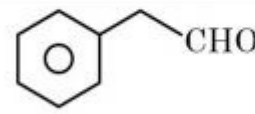
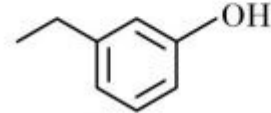
3666949411. A-II, B-III, C-IV, D-I

3666949412. A-IV, B-III, C-I, D-II

Question Number : 79 Question Id : 3666943009 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 (Reagents used)	List II (Compound with Functional group detected)
A. Alkaline solution of copper sulphate and sodium citrate	I. 
B. Neutral FeCl <sub>3</sub> solution	II. 
C. Alkaline chloroform solution	III. 
D. Potassium iodide and sodium hypochlorite	IV. 

Choose the **correct** answer from the options given below:

Options :

3666949413. A-II, B-IV, C-III, D-I

3666949414. A-IV, B-I, C-II, D-III



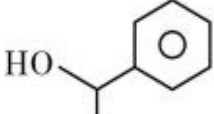

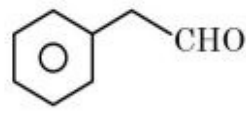
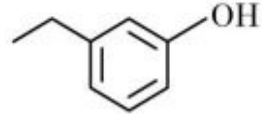
3666949415. A-III, B-IV, C-I, D-II

3666949416. A-III, B-IV, C-II, D-I

Question Number : 79 Question Id : 3666943009 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0

Correct Marks : 4 Wrong Marks : 1

सूची I को II से सुमेलित करें:

सूची -I (प्रयुक्त अभिकर्मक)	सूची - II (यौगिक और पाया गया क्रियात्मक समूह)
A. कॉपर सल्फेट और सोडियम साइट्रेट का क्षारीय विलयन	I. 
B. FeCl <sub>3</sub> का उदासीन	II. 
C. क्षारीय क्लोरोफार्म	III. 
D. पोटैशियम आयोडाइड और सोडियम हाइपोक्लोराइट	IV. 

नीचे दिये गये विकल्पों में से सही उत्तर को चुनें:

Options :

3666949413. A-II, B-IV, C-III, D-I

3666949414. A-IV, B-I, C-II, D-III

3666949415. A-III, B-IV, C-I, D-II

3666949416. A-III, B-IV, C-II, D-I

**Question Number : 80 Question Id : 3666943010 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 chromyl chloride, the number of d-electrons present on chromium is same as in (Given at no. of Ti : 22, V : 23, Cr : 24, Mn : 25, Fe : 26)

**Options :**

3666949417. Mn (VII)

3666949418. Fe (III)

3666949419. V (IV)

3666949420. Ti (III)

**Question Number : 80 Question Id : 3666943010 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**

क्रोमाइल क्लोराइड में क्रोमियम पर उपस्थित d-इलेक्ट्रॉनों की संख्या किसमें समान होती है: (दिया गया है परमाणु क्रमांक Ti : 22, V : 23, Cr : 24, Mn : 25, Fe : 26)

**Options :**

3666949417. Mn (VII)

3666949418. Fe (III)

3666949419. V (IV)

3666949420. Ti (III)

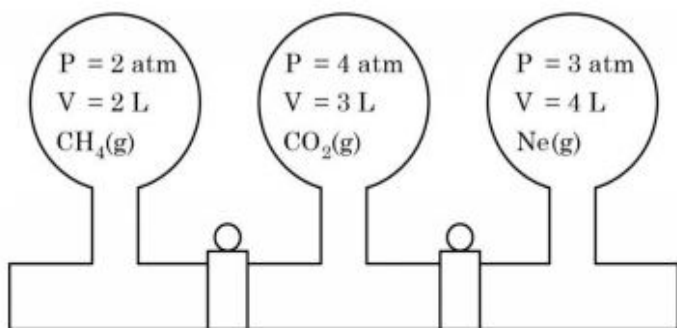
## Chemistry Section B

<b>Section Id :</b>	366694165
<b>Section Number :</b>	6
<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>	366694165
<b>Question Shuffling Allowed :</b>	Yes
<b>Is Section Default? :</b>	null

**Question Number : 81 Question Id : 3666943011 Question Type : SA Calculator : None**

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

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



Three bulbs are filled with  $\text{CH}_4$ ,  $\text{CO}_2$  and  $\text{Ne}$  as shown in the picture. The bulbs are connected through pipes of zero volume. When the stopcocks are opened and the temperature is kept constant throughout, the pressure of the system is found to be \_\_\_\_\_ atm. (Nearest integer)

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

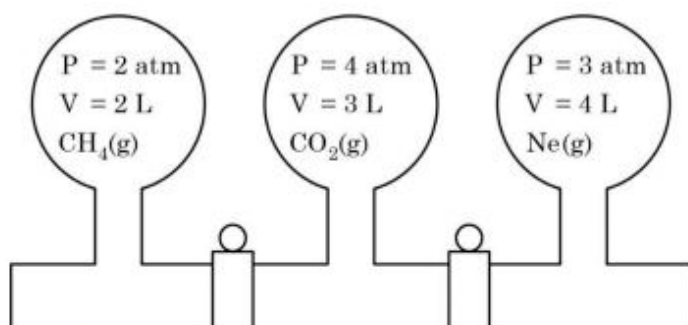
**Possible Answers :**

10

**Question Number :** 81 **Question Id :** 3666943011 **Question Type :** SA **Calculator :** None

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

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



जैसा कि चित्र में दिखाया गया है तीन बल्ब  $\text{CH}_4$ ,  $\text{CO}_2$ , और  $\text{Ne}$  से भरे गये हैं। सभी बल्ब शून्य आयतन की पाइप से जुड़े हुए हैं। पूरी प्रक्रिया के दौरान स्थिर ताप पर जब टोटी को खोला जाता है तब प्रक्रम का दाब \_\_\_\_\_ atm है। (निकटतम पूर्णांक)

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 82 **Question Id :** 3666943012 **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 following statement/s which is/are incorrect is \_\_\_\_\_

- (A) Line emission spectra are used to study the electronic structure
- (B) The emission spectra of atoms in the gas phase show a continuous spread of wavelength from red to violet
- (C) An absorption spectrum is like the photographic negative of an emission spectrum
- (D) The element helium was discovered in the sun by spectroscopic method

**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 :** 3666943012 **Question Type :** SA **Calculator :** None

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

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

निम्नलिखित में असत्य/ कथनों की संख्या \_\_\_\_\_ है।

- (A) रेखीय उत्सर्जन स्पेक्ट्रा का उपयोग इलेक्ट्रानिक संरचना के अध्ययन में होता है।
- (B) गैस अवस्था में परमाणुओं का उत्सर्जन स्पेक्ट्रम लाल से बैंगनी तरंग-दैर्घ्यों में प्रदर्शित करता है।
- (C) अवशोषण स्पेक्ट्रम उत्सर्जन स्पेक्ट्रम के फोटोग्राफीय निगेटिव की तरह होता है।
- (D) तत्व हीलियम को सूर्य में स्पेक्ट्रोस्कोपिक विधि से खोजा गया था।

**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 : 3666943013 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 following factors which affect the percent covalent character of the ionic bond is \_\_\_\_\_

- (A) Polarising power of cation
- (B) Extent of distortion of anion
- (C) Polarisability of the anion
- (D) Polarising power of anion

**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 : 3666943013 Question Type : SA Calculator : None**

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

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



निम्नलिखित कारकों की संख्या \_\_\_\_\_ है जोकि आयनिक आबन्ध में सहसंयोजी लक्षण के प्रतिशत को प्रभावित करती है।

- (A) धनायन की ध्रुवण क्षमता
- (B) ऋणायन के विखराव की सीमा
- (C) ऋणायन की ध्रुवता
- (D) ऋणायन की ध्रुवण क्षमता

**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 : 3666943014 Question Type : SA Calculator : None**

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

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

When a 60 W electric heater is immersed in a gas for 100s in a constant volume container with adiabatic walls, the temperature of the gas rises by  $5^{\circ}\text{C}$ . The heat capacity of the given gas is \_\_\_\_\_  $\text{J K}^{-1}$  (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 : 3666943014 Question Type : SA Calculator : None**

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

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

जब एक 60 W वाले विद्युत हीटर को 100 s के लिये गैस में स्थिर आयतन और रुद्धोष्म दीवार वाले बर्तन में डुबोया जाता है तो गैस का ताप  $5^{\circ}$  बढ़ जाता है। दी गई गैस की उष्माधारिता \_\_\_\_\_  $\text{JK}^{-1}$  है। (निकटतम पूर्णांक)

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

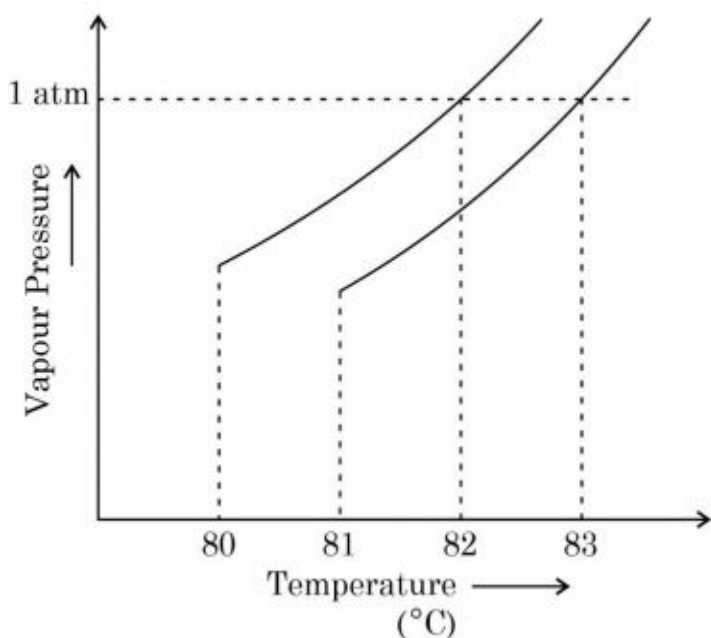
10

**Question Number :** 85 **Question Id :** 3666943015 **Question Type :** SA **Calculator :** None

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

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

The vapour pressure vs. temperature curve for a solution solvent system is shown below.



The boiling point of the solvent is \_\_\_\_\_  $^{\circ}\text{C}$ .

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal



Text Areas : PlainText

Possible Answers :

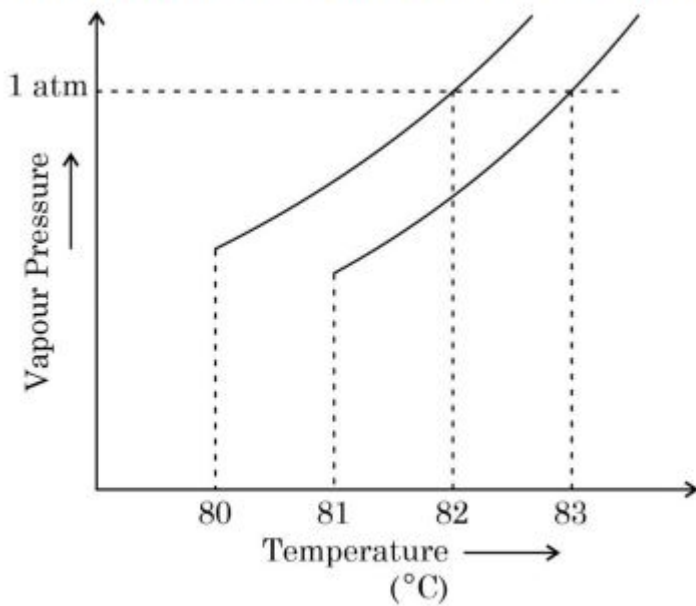
10

Question Number : 85 Question Id : 3666943015 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

किसी विलयन विलायक तंत्र के लिये वाष्प दाब और ताप के साथ मध्य वक्र नीचे दिया गया है:



विलायक का क्वथनांक \_\_\_\_\_ °C

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

10

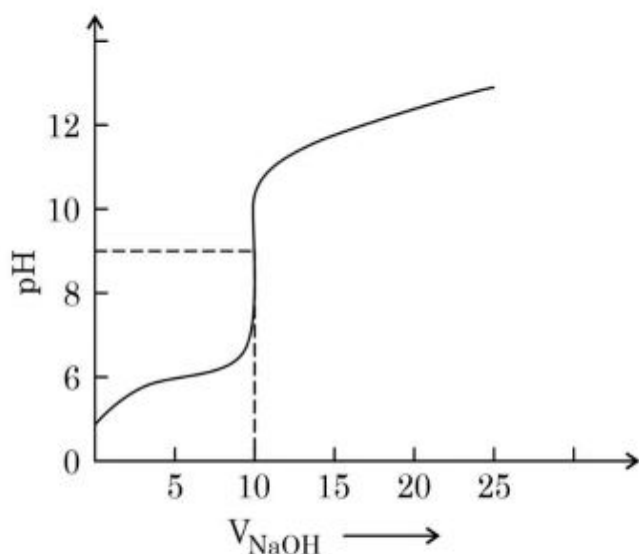
Question Number : 86 Question Id : 3666943016 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

The titration curve of weak acid vs. strong base with phenolphthalein as indicator) is shown below. The  $K_{\text{phenolphthalein}} = 4 \times 10^{-10}$ .

Given:  $\log 2 = 0.3$



The number of following statement/s which is/are correct about phenolphthalein is \_\_\_\_\_

- A. It can be used as an indicator for the titration of weak acid with weak base.
- B. It begins to change colour at  $\text{pH} = 8.4$
- C. It is a weak organic base
- D. It is colourless in acidic medium

**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 :** 3666943016 **Question Type :** SA **Calculator :** None

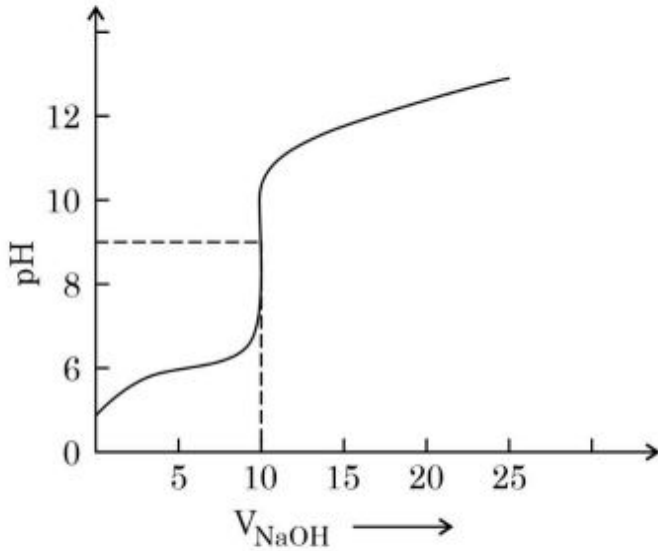
**Response Time :** N.A **Think Time :** N.A **Minimum Instruction Time :** 0

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

दुर्बल अम्ल और प्रबल क्षार का अनुमापन वक्र फेनाफ्थैलीन सूचक से नीचे दिया गया है।

$$K_{\text{phenolphthalein}} = 4 \times 10^{-10}$$

दिया गया है  $\log 2 = 0.3$



फेनाफ्थैलीन के बारे में निम्नलिखित सही कथन/ कथनों की संख्या \_\_\_\_\_ है।

- (A) यह दुर्बल अम्ल और दुर्बल क्षार के अनुमापन में सूचक की तरह प्रयोग किया जा सकता है।
- (B) यह  $\text{pH} = 8.4$  पर रंग परिवर्तन शुरू करता है।
- (C) यह दुर्बल कार्बनिक क्षार है।
- (D) यह अम्लीय माध्यम में रंगहीन होता है।

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10

**Question Number :** 87 **Question Id :** 3666943017 **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 given statement/s which is/are correct is \_\_\_\_\_

- (A) The stronger the temperature dependence of the rate constant, the higher is the activation energy.
- (B) If a reaction has zero activation energy, its rate is independent of temperature.
- (C) The stronger the temperature dependence of the rate constant, the smaller is the activation energy.
- (D) If there is no correlation between the temperature and the rate constant then it means that the reaction has negative activation energy.

**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 :** 3666943017 **Question Type :** SA **Calculator :** None

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

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

दीये गये सत्य कथन / कथनों की संख्या \_\_\_\_\_ है।

- (A) वेग स्थिरांक की अत्यधिक ताप निर्भरता होने से संक्रियण ऊर्जा होती है।
- (B) यदि किसी अभिक्रिया की संक्रियण ऊर्जा शून्य है तो इसका वेग ताप से स्वतंत्र होता है।
- (C) वेग स्थिरांक की अत्याधिक ताप निर्भरता होने से संक्रियण ऊर्जा निम्नतम होती है।
- (D) यदि ताप और वेग स्थिरांक के मध्य कोई सम्बन्ध न हो तो अभिक्रिया की संक्रियण ऊर्जा नकारात्मक होती 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 : 3666943018 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

XeF<sub>4</sub> reacts with SbF<sub>5</sub> to form



$$m + n + y + z = \underline{\hspace{2cm}}$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Equal

Text Areas : PlainText

Possible Answers :

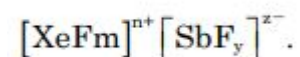
10

Question Number : 88 Question Id : 3666943018 Question Type : SA Calculator : None

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

Correct Marks : 4 Wrong Marks : 1

XeF<sub>4</sub>, SbF<sub>5</sub> से अभिक्रिया करके देता है



$$m + n + y + z = \underline{\hspace{2cm}}$$

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 : 3666943019 Question Type : SA Calculator : None

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

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

Molar mass of the hydrocarbon (X) which on ozonolysis consumes one mole of  $O_3$  per mole of (X) and gives one mole each of ethanal and propanone is \_\_\_\_\_  $g\ mol^{-1}$  (Molar mass of C :  $12\ g\ mol^{-1}$ , H :  $1\ g\ mol^{-1}$ )

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

**Question Number : 89 Question Id : 3666943019 Question Type : SA Calculator : None**

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

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

हाइड्रोजन (X) का मोलर द्रव्यमान \_\_\_\_\_ है जो कि ओजोनीकरण के लिये (X) के प्रति मोल में  $O_3$  का एक मोल खर्च करती है और एक मोल एथेनल और एक मोल प्रोपेनोन देती है।  
(मोलर द्रव्यमान C :  $12\ g\ mol^{-1}$ , H :  $1\ g\ mol^{-1}$ )

**Response Type : Numeric**

**Evaluation Required For SA : Yes**

**Show Word Count : Yes**

**Answers Type : Equal**

**Text Areas : PlainText**

**Possible Answers :**

10

**Question Number : 90 Question Id : 3666943020 Question Type : SA Calculator : None**

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

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

0.5 g of an organic compound (X) with 60% carbon will produce \_\_\_\_\_  $\times 10^{-1}$  g of  $\text{CO}_2$  on complete combustion.

**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 :** 3666943020 **Question Type :** SA **Calculator :** None

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

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

किसी कार्बनिक यौगिक (x) का जिसमें 60% कार्बन है पूर्ण दहन पर \_\_\_\_\_  $\times 10^{-1}$  g कार्बनडाईऑक्साइड देगा।

**Response Type :** Numeric

**Evaluation Required For SA :** Yes

**Show Word Count :** Yes

**Answers Type :** Equal

**Text Areas :** PlainText

**Possible Answers :**

10