

# National Testing Agency

<b>Question Paper Name:</b>	Paper I EH 9th April 2019 Shift 1
<b>Subject Name:</b>	Paper I EH
<b>Creation Date:</b>	2019-04-09 14:04:27
<b>Duration:</b>	180
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<b>Display Marks:</b>	Yes
<b>Share Answer Key With Delivery Engine:</b>	Yes
<b>Actual Answer Key:</b>	Yes

## Paper I

<b>Group Number :</b>	1
<b>Group Id :</b>	416529164
<b>Group Maximum Duration :</b>	0
<b>Group Minimum Duration :</b>	180
<b>Revisit allowed for view? :</b>	No
<b>Revisit allowed for edit? :</b>	No
<b>Break time:</b>	0
<b>Group Marks:</b>	360

## Physics

<b>Section Id :</b>	416529286
<b>Section Number :</b>	1
<b>Section type :</b>	Online
<b>Mandatory or Optional:</b>	Mandatory
<b>Number of Questions:</b>	30
<b>Number of Questions to be attempted:</b>	30
<b>Section Marks:</b>	120
<b>Display Number Panel:</b>	Yes
<b>Group All Questions:</b>	No

<b>Sub-Section Number:</b>	1
<b>Sub-Section Id:</b>	416529426
<b>Question Shuffling Allowed :</b>	Yes

Question Number : 1 Question Id : 41652913776 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

In the density measurement of a cube, the mass and edge length are measured as  $(10.00 \pm 0.10)$  kg and  $(0.10 \pm 0.01)$  m, respectively. The error in the measurement of density is :

Options :

41652953882.  $0.10 \text{ kg/m}^3$

41652953883.  $0.07 \text{ kg/m}^3$

41652953884.  $0.31 \text{ kg/m}^3$

41652953885.  $0.01 \text{ kg/m}^3$

**Question Number : 1 Question Id : 41652913776 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

एक घनाकार गुटके का घनत्व निकालने के लिए, उसका  
द्रव्यमान तथा कोर की लम्बाई, क्रमशः,  
 $(10.00 \pm 0.10) \text{ kg}$  तथा  $(0.10 \pm 0.01) \text{ m}$  मापी जाती  
है। घनत्व के मापन की त्रुटि होगी :

**Options :**

41652953882.  $0.10 \text{ kg/m}^3$

41652953883.  $0.07 \text{ kg/m}^3$

41652953884.  $0.31 \text{ kg/m}^3$

41652953885.  $0.01 \text{ kg/m}^3$

**Question Number : 2 Question Id : 41652913777 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

The stream of a river is flowing with a speed  
of  $2 \text{ km/h}$ . A swimmer can swim at a speed  
of  $4 \text{ km/h}$ . What should be the direction  
of the swimmer with respect to the flow of  
the river to cross the river straight ?

**Options :**

41652953886.  $150^\circ$

41652953887.  $60^\circ$

41652953888.  $90^\circ$

41652953889.  $120^\circ$

Question Number : 2 Question Id : 41652913777 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक नदी की धारा  $2 \text{ km/h}$  की गति से बह रही है।

एक तैराक  $4 \text{ km/h}$  की गति से तैर सकता है। तैराक का नदी के प्रति तैरने की वह दिशा, जिससे वह नदी को सीधा पार कर सके, क्या होगी ?

Options :

41652953886.  $150^\circ$

41652953887.  $60^\circ$

41652953888.  $90^\circ$

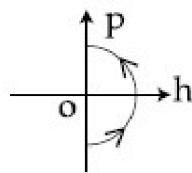
41652953889.  $120^\circ$

Question Number : 3 Question Id : 41652913778 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

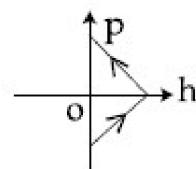
Correct Marks : 4 Wrong Marks : 1

A ball is thrown vertically up (taken as +z-axis) from the ground. The correct momentum-height ( $p-h$ ) diagram is :

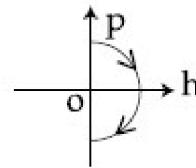
Options :



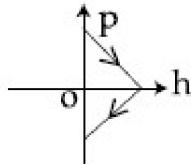
41652953890.



41652953891.



41652953892.



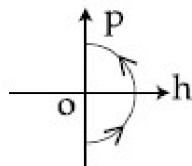
41652953893.

Question Number : 3 Question Id : 41652913778 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

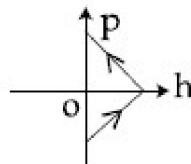
Correct Marks : 4 Wrong Marks : 1

एक गेंद को ऊपर की ओर ऊर्ध्वाधर (मानो +z-अक्ष) दिशा में फेंका जाता है। इसका सही संवेग-ऊँचाई ( $p-h$ ) चित्र होगा :

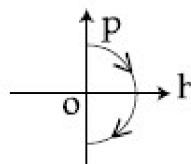
Options :



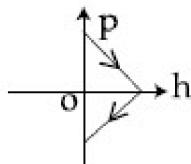
41652953890.



41652953891.



41652953892.



41652953893.

Question Number : 4 Question Id : 41652913779 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A body of mass 2 kg makes an elastic collision with a second body at rest and continues to move in the original direction but with one fourth of its original speed. What is the mass of the second body ?

Options :

41652953894. 1.5 kg

41652953895. 1.2 kg

41652953896. 1.0 kg

41652953897. 1.8 kg

**Question Number : 4 Question Id : 41652913779 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

एक 2 kg द्रव्यमान के पिण्ड का प्रत्यास्थ संघटु एक स्थिर पिंड से होता है। पहला पिण्ड अपनी प्रारम्भिक दिशा में चलता रहता है लेकिन उसकी गति पहले से एक चौथाई हो जाती है। दूसरे पिण्ड का द्रव्यमान क्या होगा?

**Options :**

41652953894. 1.5 kg

41652953895. 1.2 kg

41652953896. 1.0 kg

41652953897. 1.8 kg

**Question Number : 5 Question Id : 41652913780 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

A uniform cable of mass 'M' and length 'L' is placed on a horizontal surface such that

its  $\left(\frac{1}{n}\right)^{\text{th}}$  part is hanging below the edge

of the surface. To lift the hanging part of the cable upto the surface, the work done should be :

**Options :**

41652953898.  $\frac{MgL}{n^2}$

41652953899.  $\frac{2MgL}{n^2}$

$$\frac{MgL}{2n^2}$$

41652953900.

$$nMgL$$

Question Number : 5 Question Id : 41652913780 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान 'M' तथा लम्बाई 'L' की एक एकसमान केबल एक क्षैतिज समतल पर इस तरह रखी है कि

इसकी  $\frac{1}{n}$  लम्बाई का हिस्सा समतल की कोर से नीचे लटका है। इस लटके हुए केबल के हिस्से को समतल तक ऊपर खींचने के लिए किया गया कार्य होगा :

Options :

$$\frac{MgL}{n^2}$$

41652953898.

$$\frac{2MgL}{n^2}$$

41652953899.

$$\frac{MgL}{2n^2}$$

41652953900.

$$nMgL$$

Question Number : 6 Question Id : 41652913781 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The following bodies are made to roll up (without slipping) the same inclined plane from a horizontal plane : (i) a ring of radius R, (ii) a solid cylinder of radius  $\frac{R}{2}$  and (iii) a solid sphere of radius  $\frac{R}{4}$ . If,

in each case, the speed of the center of mass at the bottom of the incline is same, the ratio of the maximum heights they climb is :

Options :

$$4:3:2$$

41652953902.

41652953903. 14 : 15 : 20

41652953904. 10 : 15 : 7

41652953905. 2 : 3 : 4

**Question Number : 6 Question Id : 41652913781 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

निम्न वस्तुएँ एक क्षेत्रज समतल से एक झुके हुए समतल पर लुढ़कते हुए (बिना फिसले) ऊपर की ओर चढ़ती

हैं : (i) त्रिज्या R का एक वलय, (ii) त्रिज्या  $\frac{R}{2}$  का

एक ठोस बेलन तथा (iii) त्रिज्या  $\frac{R}{4}$  का एक ठोस गोला। यदि प्रत्येक वस्तु के द्रव्यमान केन्द्र की गतियाँ झुके हुए समतल के निम्न विन्दु पर बराबर हों, तो उनके द्वारा चढ़ी गयी अधिकतम ऊँचाइयों का अनुपात होगा :

**Options :**

41652953902. 4 : 3 : 2

41652953903. 14 : 15 : 20

41652953904. 10 : 15 : 7

41652953905. 2 : 3 : 4

**Question Number : 7 Question Id : 41652913782 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

A stationary horizontal disc is free to rotate about its axis. When a torque is applied on it, its kinetic energy as a function of  $\theta$ , where  $\theta$  is the angle by which it has rotated, is given as  $k\theta^2$ . If its moment of inertia is I then the angular acceleration of the disc is:

**Options :**

$$\frac{k}{I}\theta$$

41652953906.

$$\frac{2k}{I}\theta$$

41652953907.

$$\frac{k}{2I}\theta$$

41652953908.

$$\frac{k}{4I}\theta$$

41652953909.

**Question Number : 7 Question Id : 41652913782 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

एक स्थिर क्षैतिज डिस्क अपनी अक्ष के परितः घूमने के लिये स्वतंत्र है। जब इस पर एक बल आधूर्ण लगाया जाता है, तो इसकी गतिज ऊर्जा  $\theta$  के फलन में  $k\theta^2$  से दी जाती है, जहाँ  $\theta$  परिभ्रमण कोण है। यदि इसका जड़त्व आधूर्ण I है तो इसका कोणीय त्वरण होगा :

**Options :**

$$\frac{k}{I}\theta$$

41652953906.

$$\frac{2k}{I}\theta$$

41652953907.

$$\frac{k}{2I}\theta$$

41652953908.

$$\frac{k}{4I}\theta$$

41652953909.

**Question Number : 8 Question Id : 41652913783 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

A solid sphere of mass 'M' and radius 'a' is surrounded by a uniform concentric spherical shell of thickness  $2a$  and mass  $2M$ . The gravitational field at distance '3a' from the centre will be :

**Options :**

$$\frac{GM}{9a^2}$$

41652953910.

$$\frac{2GM}{9a^2}$$

41652953911.

$$\frac{GM}{3a^2}$$

$$\frac{2GM}{3a^2}$$

41652953913.

Question Number : 8 Question Id : 41652913783 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव्यमान 'M' तथा त्रिज्या 'a' का एक ठोस गोला एक एकसमान समकेन्द्रीय गोलीय आवरण, जिसकी मोटाई '2a' तथा द्रव्यमान '2M' है, से विरा है। केन्द्र से '3a' दूरी पर गुरुत्वीय क्षेत्र होगा :

Options :

$$\frac{GM}{9a^2}$$

41652953910.

$$\frac{2GM}{9a^2}$$

41652953911.

$$\frac{GM}{3a^2}$$

41652953912.

$$\frac{2GM}{3a^2}$$

41652953913.

Question Number : 9 Question Id : 41652913784 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

For a given gas at 1 atm pressure, rms speed of the molecules is 200 m/s at 127 °C. At 2 atm pressure and at 227 °C, the rms speed of the molecules will be :

Options :

$$100\sqrt{5} \text{ m/s}$$

41652953914.

$$80\sqrt{5} \text{ m/s}$$

41652953915.

41652953916. 100 m/s

41652953917. 80 m/s

Question Number : 9 Question Id : 41652913784 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

1 atm दबाव तथा 127 °C तापमान पर एक दी हुयी  
गैस के अणुओं का वर्ग माध्य मूल वेग  
200 m/s है। इसी गैस के अणुओं का वर्ग माध्य मूल  
वेग 227 °C तथा 2 atm दबाव पर होगा :

Options :

41652953914.  $100\sqrt{5}$  m/s

41652953915.  $80\sqrt{5}$  m/s

41652953916. 100 m/s

41652953917. 80 m/s

Question Number : 10 Question Id : 41652913785 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A simple pendulum oscillating in air has period T. The bob of the pendulum is completely immersed in a non-viscous

liquid. The density of the liquid is  $\frac{1}{16}$ th of the material of the bob. If the bob is inside liquid all the time, its period of oscillation in this liquid is :

Options :

41652953918.  $2T\sqrt{\frac{1}{10}}$

41652953919.  $4T\sqrt{\frac{1}{15}}$

41652953920.  $4T\sqrt{\frac{1}{14}}$

$$2T\sqrt{\frac{1}{14}}$$

41652953921.

Question Number : 10 Question Id : 41652913785 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक सरल दोलक का हवा में आवर्तकाल T है। इस दोलक के गोलक को एक श्यानता रहित द्रव, जिसका घनत्व गोलक के घनत्व का  $\frac{1}{16}$  है, में दोलन करवाते हैं। यदि दोलन के समय यह गोलक पूर्णतया: द्रव में रहता है तो इसका आवर्तकाल होगा :

Options :

$$2T\sqrt{\frac{1}{10}}$$

41652953918.

$$4T\sqrt{\frac{1}{15}}$$

41652953919.

$$4T\sqrt{\frac{1}{14}}$$

41652953920.

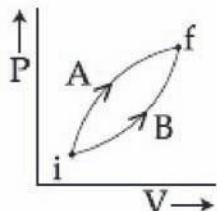
$$2T\sqrt{\frac{1}{14}}$$

41652953921.

Question Number : 11 Question Id : 41652913786 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Following figure shows two processes A and B for a gas. If  $\Delta Q_A$  and  $\Delta Q_B$  are the amount of heat absorbed by the system in two cases, and  $\Delta U_A$  and  $\Delta U_B$  are changes in internal energies, respectively, then :



Options :

$$41652953922. \quad \Delta Q_A = \Delta Q_B; \Delta U_A = \Delta U_B$$

41652953923.  $\Delta Q_A > \Delta Q_B, \Delta U_A > \Delta U_B$

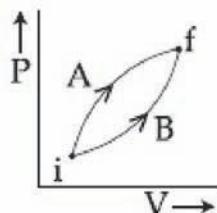
41652953924.  $\Delta Q_A > \Delta Q_B, \Delta U_A = \Delta U_B$

41652953925.  $\Delta Q_A < \Delta Q_B, \Delta U_A < \Delta U_B$

**Question Number : 11 Question Id : 41652913786 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

दिये गये चित्र में दो प्रक्रियाओं A व B को एक गैस के लिये दिखाया है। यदि  $\Delta Q_A$  व  $\Delta Q_B$  इन प्रक्रियाओं के दौरान शोषित ऊर्जाएँ तथा  $\Delta U_A$  व  $\Delta U_B$  गैस की आंतरिक ऊर्जा के परिवर्तन हैं, तो :



**Options :**

41652953922.  $\Delta Q_A = \Delta Q_B; \Delta U_A = \Delta U_B$

41652953923.  $\Delta Q_A > \Delta Q_B, \Delta U_A > \Delta U_B$

41652953924.  $\Delta Q_A > \Delta Q_B, \Delta U_A = \Delta U_B$

41652953925.  $\Delta Q_A < \Delta Q_B, \Delta U_A < \Delta U_B$

**Question Number : 12 Question Id : 41652913787 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

An HCl molecule has rotational, translational and vibrational motions. If the rms velocity of HCl molecules in its gaseous phase is  $\bar{v}$ , m is its mass and  $k_B$  is Boltzmann constant, then its temperature will be :

**Options :**

41652953926.  $\frac{m\bar{v}^2}{7k_B}$

$$\frac{m\bar{v}^2}{5k_B}$$

41652953927.

$$\frac{m\bar{v}^2}{3k_B}$$

41652953928.

$$\frac{m\bar{v}^2}{6k_B}$$

41652953929.

**Question Number : 12 Question Id : 41652913787 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

HCl अणु में घूर्णन, स्थानान्तरीय तथा कम्पन गतियाँ होती हैं। यदि HCl गैस के अणुओं का वर्ग माध्य मूल वेग  $\bar{v}$  है, m इसका द्रव्यमान है, तो इसका तापमान होगा : ( $k_B$  : बोलट्समान नियतांक)

**Options :**

$$\frac{m\bar{v}^2}{7k_B}$$

41652953926.

$$\frac{m\bar{v}^2}{5k_B}$$

41652953927.

$$\frac{m\bar{v}^2}{3k_B}$$

41652953928.

$$\frac{m\bar{v}^2}{6k_B}$$

41652953929.

**Question Number : 13 Question Id : 41652913788 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

A string is clamped at both the ends and it is vibrating in its 4<sup>th</sup> harmonic. The equation of the stationary wave is  $Y=0.3 \sin(0.157x) \cos(200\pi t)$ . The length of the string is : (All quantities are in SI units.)

**Options :**

41652953930. 80 m

41652953931. 60 m

41652953932. 40 m

41652953933. 20 m

**Question Number : 13 Question Id : 41652913788 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

एक डोरी के दोनों सिरों को जकड़ कर रखा गया है तथा  
यह अपने चतुर्थ संनादी में कम्पन कर रही है। इस  
अप्रगामी तरंग का समीकरण है  $Y = 0.3 \sin(0.157x)$   
 $\cos(200\pi t)$ . इस डोरी की लम्बाई होगी :  
(सभी राशियाँ SI मात्रक में हैं।)

**Options :**

41652953930. 80 m

41652953931. 60 m

41652953932. 40 m

41652953933. 20 m

**Question Number : 14 Question Id : 41652913789 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

The pressure wave,  
 $P = 0.01 \sin[1000t - 3x] \text{ Nm}^{-2}$ , corresponds  
to the sound produced by a vibrating blade  
on a day when atmospheric temperature is  
 $0^\circ\text{C}$ . On some other day when temperature  
is  $T$ , the speed of sound produced by the  
same blade and at the same frequency is  
found to be  $336 \text{ ms}^{-1}$ . Approximate value  
of  $T$  is :

**Options :**

41652953934.  $12^\circ\text{C}$

41652953935.  $11^{\circ}\text{C}$

41652953936.  $15^{\circ}\text{C}$

41652953937.  $4^{\circ}\text{C}$

**Question Number : 14 Question Id : 41652913789 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

कंपन करती हुयी एक पत्ती द्वारा उत्पादित ध्वनि के अनुसार दबाव तरंग का रूप है

$P = 0.01 \sin[1000t - 3x] \text{ Nm}^{-2}$  इस दिन वायुमण्डल का तापमान  $0^{\circ}\text{C}$  है। किसी और दिन जब तापमान  $T$  है तो उसी पत्ती द्वारा उसी आवृत्ति से उत्पादित ध्वनि की गति  $336 \text{ ms}^{-1}$  पायी जाती है।  $T$  का लगभग मान होगा :

**Options :**

41652953934.  $12^{\circ}\text{C}$

41652953935.  $11^{\circ}\text{C}$

41652953936.  $15^{\circ}\text{C}$

41652953937.  $4^{\circ}\text{C}$

**Question Number : 15 Question Id : 41652913790 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

A capacitor with capacitance  $5 \mu\text{F}$  is charged to  $5 \mu\text{C}$ . If the plates are pulled apart to reduce the capacitance to  $2 \mu\text{F}$ , how much work is done ?

**Options :**

41652953938.  $6.25 \times 10^{-6} \text{ J}$

41652953939.  $2.16 \times 10^{-6} \text{ J}$

41652953940.  $2.55 \times 10^{-6} \text{ J}$

41652953941.  $3.75 \times 10^{-6} \text{ J}$

Correct Marks : 4 Wrong Marks : 1

5  $\mu$ F धारिता के एक संधारित्र को 5  $\mu$ C तक आवेशित किया जाता है। यदि संधारित्र की प्लेटों को दूर हटाकर उसकी धारिता 2  $\mu$ F कर दी जाये तो किया गया कार्य होगा :

Options :

41652953938.  $6.25 \times 10^{-6}$  J

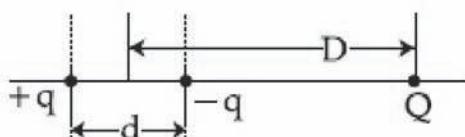
41652953939.  $2.16 \times 10^{-6}$  J

41652953940.  $2.55 \times 10^{-6}$  J

41652953941.  $3.75 \times 10^{-6}$  J

Correct Marks : 4 Wrong Marks : 1

A system of three charges are placed as shown in the figure :



If  $D \gg d$ , the potential energy of the system is best given by :

Options :

41652953942. 
$$\frac{1}{4\pi\epsilon_0} \left[ + \frac{q^2}{d} + \frac{qQd}{D^2} \right]$$

41652953943. 
$$\frac{1}{4\pi\epsilon_0} \left[ - \frac{q^2}{d} - \frac{qQd}{2D^2} \right]$$

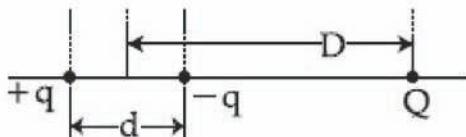
41652953944. 
$$\frac{1}{4\pi\epsilon_0} \left[ - \frac{q^2}{d} + \frac{2qQd}{D^2} \right]$$

41652953945. 
$$\frac{1}{4\pi\epsilon_0} \left[ - \frac{q^2}{d} - \frac{qQd}{D^2} \right]$$

Correct Marks : 4 Wrong Marks : 1

तीन बिन्दु आवेशों का एक निकाय चित्र में दर्शित है।

यदि  $D \gg d$  तो इस निकाय की लगभग स्थितिज ऊर्जा  
 होगी :



Options :

$$\frac{1}{4\pi\epsilon_0} \left[ + \frac{q^2}{d} + \frac{qQd}{D^2} \right]$$

41652953942.

$$\frac{1}{4\pi\epsilon_0} \left[ - \frac{q^2}{d} - \frac{qQd}{2D^2} \right]$$

41652953943.

$$\frac{1}{4\pi\epsilon_0} \left[ - \frac{q^2}{d} + \frac{2qQd}{D^2} \right]$$

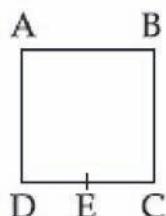
41652953944.

$$\frac{1}{4\pi\epsilon_0} \left[ - \frac{q^2}{d} - \frac{qQd}{D^2} \right]$$

41652953945.

Correct Marks : 4 Wrong Marks : 1

A wire of resistance R is bent to form a square ABCD as shown in the figure. The effective resistance between E and C is :  
 (E is mid-point of arm CD)



Options :

$$\frac{3}{4} R$$

41652953946.

$$\frac{1}{16} R$$

41652953947.

$$\frac{7}{64} R$$

41652953948.

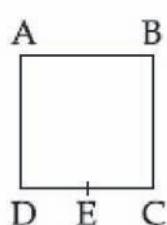
$$R$$

41652953949.

Question Number : 17 Question Id : 41652913792 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

प्रतिरोध  $R$  के एक तार को चित्रानुसार एक वर्ग ABCD में मोड़ा गया है। बिन्दु E तथा C के बीच प्रभावी प्रतिरोध का मान होगा :  
(E भुजा CD का मध्यबिन्दु है)



Options :

$$\frac{3}{4} R$$

41652953946.

$$\frac{1}{16} R$$

41652953947.

$$\frac{7}{64} R$$

41652953948.

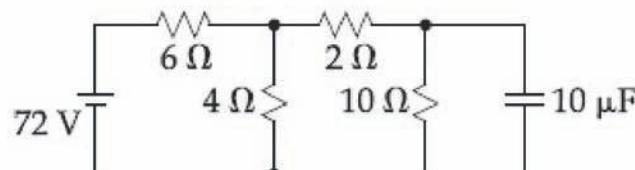
$$R$$

41652953949.

Question Number : 18 Question Id : 41652913793 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Determine the charge on the capacitor in the following circuit :



Options :

$$2 \mu C$$

41652953950.

41652953951.  $200 \mu\text{C}$

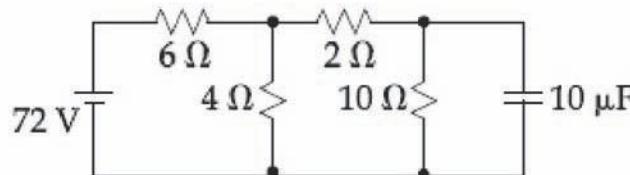
41652953952.  $60 \mu\text{C}$

41652953953.  $10 \mu\text{C}$

Question Number : 18 Question Id : 41652913793 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

दिये गये परिपथ में संधारित्र पर आवेश ज्ञात कीजिये।



Options :

41652953950.  $2 \mu\text{C}$

41652953951.  $200 \mu\text{C}$

41652953952.  $60 \mu\text{C}$

41652953953.  $10 \mu\text{C}$

Question Number : 19 Question Id : 41652913794 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A rectangular coil (Dimension  $5 \text{ cm} \times 2.5 \text{ cm}$ ) with 100 turns, carrying a current of 3 A in the clock-wise direction, is kept centered at the origin and in the X-Z plane. A magnetic field of 1 T is applied along X-axis. If the coil is tilted through  $45^\circ$  about Z-axis, then the torque on the coil is :

Options :

41652953954. 0.27 Nm

41652953955. 0.55 Nm

41652953956. 0.38 Nm

41652953957. 0.42 Nm

Question Number : 19 Question Id : 41652913794 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक 100 फेरे वाली आयताकार ( $5 \text{ cm} \times 2.5 \text{ cm}$ ) कुंडली में 3 A की धारा घड़ी की सुई की दिशा में बह रही है। इस कुंडली को मूल बिन्दु पर केन्द्रित करके X-Z समतल में रखा गया है। 1 T का चुम्बकीय क्षेत्र X-अक्ष की दिशा में है। यदि कुंडली को Z-अक्ष के परिवर्तन:  $45^\circ$  से घुमाते हैं, तो इस पर लगा बल आधूर्ण होगा :

Options :

41652953954. 0.27 Nm

41652953955. 0.55 Nm

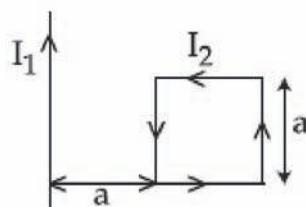
41652953956. 0.38 Nm

41652953957. 0.42 Nm

Question Number : 20 Question Id : 41652913795 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A rigid square loop of side 'a' and carrying current  $I_2$  is lying on a horizontal surface near a long current  $I_1$  carrying wire in the same plane as shown in figure. The net force on the loop due to the wire will be :



Options :

41652953958. Zero

41652953959. Attractive and equal to  $\frac{\mu_0 I_1 I_2}{3\pi}$

Repulsive and equal to  $\frac{\mu_0 I_1 I_2}{4\pi}$

41652953960.

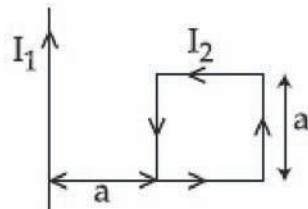
Repulsive and equal to  $\frac{\mu_0 I_1 I_2}{2\pi}$

41652953961.

Question Number : 20 Question Id : 41652913795 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

भुजा 'a' वाला एक दृढ़ वर्गाकार बलय, जिसमें धारा  $I_2$  है, एक क्षैतिज समतल पर रखा है। इसी समतल पर धारा  $I_1$  वाला एक तार चित्रानुसार रखा है। तार द्वारा इस बलय पर लगा कुल बल होगा :



Options :

41652953958. शून्य

आकर्षक एवं  $\frac{\mu_0 I_1 I_2}{3\pi}$  के बराबर

41652953959.

प्रतिकर्षक एवं  $\frac{\mu_0 I_1 I_2}{4\pi}$  के बराबर

41652953960.

प्रतिकर्षक एवं  $\frac{\mu_0 I_1 I_2}{2\pi}$  के बराबर

41652953961.

Question Number : 21 Question Id : 41652913796 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The total number of turns and cross-section area in a solenoid is fixed. However, its length L is varied by adjusting the separation between windings. The inductance of solenoid will be proportional to :

Options :

41652953962. L

41652953963.  $L^2$

41652953964.  $1/L^2$

41652953965.  $1/L$

**Question Number : 21 Question Id : 41652913796 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

एक परिनालिका में कुल फेरों की संख्या तथा अनुप्रस्थ क्षेत्रफल नियत है। किन्तु इसकी लम्बाई  $L$  को इसके फेरों के बीच दूरी बदलकर परिवर्तित कर सकते हैं। इस परिनालिका का स्वप्रेरकत्व समानुपाती होगा :

**Options :**

41652953962.  $L$

41652953963.  $L^2$

41652953964.  $1/L^2$

41652953965.  $1/L$

**Question Number : 22 Question Id : 41652913797 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

The magnetic field of a plane electromagnetic wave is given by :

$$\vec{B} = B_0 \hat{i} [\cos(kz - \omega t)] + B_1 \hat{j} \cos(kz + \omega t)$$

where  $B_0 = 3 \times 10^{-5}$  T and  $B_1 = 2 \times 10^{-6}$  T.

The rms value of the force experienced by a stationary charge  $Q = 10^{-4}$  C at  $z = 0$  is closest to :

**Options :**

41652953966. 0.6 N

41652953967.  $3 \times 10^{-2}$  N

41652953968. 0.9 N

0.1 N

41652953969.

Question Number : 22 Question Id : 41652913797 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक समतल विद्युत चुम्बकीय तरंग का चुम्बकीय क्षेत्र  
निम्न है :

$$\vec{B} = B_0 \hat{i} [\cos(kz - \omega t)] + B_1 \hat{j} \cos(kz + \omega t)$$

यहाँ  $B_0 = 3 \times 10^{-5}$  T तथा  $B_1 = 2 \times 10^{-6}$  T है।  
एक स्थिर आवेश  $Q = 10^{-4}$  C को z=0 पर रखा  
गया है। इसपर लगे वर्ग माध्य मूल बल का सन्त्रिकट  
मान होगा :

Options :

41652953966, 0.6 N

41652953967,  $3 \times 10^{-2}$  N

41652953968, 0.9 N

41652953969, 0.1 N

Question Number : 23 Question Id : 41652913798 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A concave mirror for face viewing has focal length of 0.4 m. The distance at which you hold the mirror from your face in order to see your image upright with a magnification of 5 is :

Options :

41652953970, 0.16 m

41652953971, 1.60 m

41652953972, 0.32 m

41652953973, 0.24 m

Question Number : 23 Question Id : 41652913798 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अपने चेहरे को देखने के लिये एक 0.4 m फोकस दूरी का अवतल दर्पण उपयोग करते हैं। यदि अपने प्रतिबिंब को सीधा और 5 गुना बड़ा देखना हो तो दर्पण की चेहरे से दूरी का मान होगा :

Options :

41652953970. 0.16 m

41652953971. 1.60 m

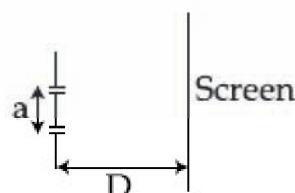
41652953972. 0.32 m

41652953973. 0.24 m

Question Number : 24 Question Id : 41652913799 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The figure shows a Young's double slit experimental setup. It is observed that when a thin transparent sheet of thickness  $t$  and refractive index  $\mu$  is put in front of one of the slits, the central maximum gets shifted by a distance equal to  $n$  fringe widths. If the wavelength of light used is  $\lambda$ ,  $t$  will be :



Options :

41652953974. 
$$\frac{D\lambda}{a(\mu - 1)}$$

41652953975. 
$$\frac{nD\lambda}{a(\mu - 1)}$$

41652953976. 
$$\frac{2D\lambda}{a(\mu - 1)}$$

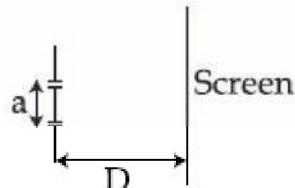
41652953977. 
$$\frac{2nD\lambda}{a(\mu - 1)}$$

Question Number : 24 Question Id : 41652913799 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

चित्र में यंग का द्विजिरी प्रयोग का विन्यास दिखाया है।

यह पाया जाता है कि जब एक पतली पारदर्शी मोटाई  $t$  तथा अपवर्तनांक  $\mu$  की ज़िल्ली एक ज़िरी के सामने लगाते हैं, तो केन्द्रीय अधिकतम अपने स्थान से  $n$  फ्रिंज-चौड़ाई से विस्थापित हो जाता है। यदि इस प्रयोग में उपयोग किये गये प्रकाश की तरंगदैर्घ्य  $\lambda$  है तो  $t$  का मान होगा :



Options :

$$41652953974. \frac{D\lambda}{a(\mu - 1)}$$

$$41652953975. \frac{nD\lambda}{a(\mu - 1)}$$

$$41652953976. \frac{2D\lambda}{a(\mu - 1)}$$

$$41652953977. \frac{2nD\lambda}{a(\mu - 1)}$$

Question Number : 25 Question Id : 41652913800 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Taking the wavelength of first Balmer line in hydrogen spectrum ( $n=3$  to  $n=2$ ) as 660 nm, the wavelength of the 2<sup>nd</sup> Balmer line ( $n=4$  to  $n=2$ ) will be :

Options :

$$41652953978. 488.9 \text{ nm}$$

$$41652953979. 889.2 \text{ nm}$$

$$41652953980. 388.9 \text{ nm}$$

642.7 nm

41652953981.

Question Number : 25 Question Id : 41652913800 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि हाइड्रोजन स्पेक्ट्रम की प्रथम बार्मर लाईन ( $n=3$

से  $n=2$ ) की तरंगदैर्घ्य 660 nm, हो तो दूसरी बार्मर

लाईन ( $n=4$  से  $n=2$ ) की तरंगदैर्घ्य होगी :

Options :

488.9 nm

41652953978.

889.2 nm

41652953979.

388.9 nm

41652953980.

642.7 nm

41652953981.

Question Number : 26 Question Id : 41652913801 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The electric field of light wave is given as

$$\vec{E} = 10^{-3} \cos\left(\frac{2\pi x}{5 \times 10^{-7}} - 2\pi \times 6 \times 10^{14} t\right) \hat{x} \text{ N/C}$$

This light falls on a metal plate of work function 2eV. The stopping potential of the photo-electrons is :

$$\text{Given, } E \text{ (in eV)} = \frac{12375}{\lambda \text{ (in } \text{\AA})}$$

Options :

0.72 V

41652953982.

0.48 V

41652953983.

2.48 V

41652953984.

2.0 V

41652953985.

Question Number : 26 Question Id : 41652913801 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

प्रकाश की एक तरंग का विद्युत क्षेत्र निम्न है,

$$\vec{E} = 10^{-3} \cos\left(\frac{2\pi x}{5 \times 10^{-7}} - 2\pi \times 6 \times 10^{14} t\right) \hat{x} \frac{\text{N}}{\text{C}}$$

यह प्रकाश एक धातु की प्लेट पर आपत्ति है जिसका कार्य फलन 2 eV है। प्रकाशिक इलेक्ट्रॉनों के निरोधी विभव का मान होगा :

$$\text{दिया है } E (\text{eV में}) = \frac{12375}{\lambda (\text{\AA में})}$$

Options :

41652953982. 0.72 V

41652953983. 0.48 V

41652953984. 2.48 V

41652953985. 2.0 V

Question Number : 27 Question Id : 41652913802 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

An NPN transistor is used in common emitter configuration as an amplifier with 1 kΩ load resistance. Signal voltage of 10 mV is applied across the base-emitter. This produces a 3 mA change in the collector current and 15 μA change in the base current of the amplifier. The input resistance and voltage gain are :

Options :

41652953986. 0.33 kΩ, 300

41652953987. 0.33 kΩ, 1.5

41652953988. 0.67 kΩ, 300

41652953989. 0.67 kΩ, 200

Question Number : 27 Question Id : 41652913802 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एक NPN ट्रान्सिस्टर को उभयनिष्ठ उत्सर्जक विन्यास में एक प्रवर्धक (amplifier) की तरह उपयोग करते हैं। इसमें  $1\text{ k}\Omega$  का लोड प्रतिरोध लगा है।  $10\text{ mV}$  का सिग्नल वोल्टेज आधार व उत्सर्जक के बीच में लगाने पर संग्राहक धारा में  $3\text{ mA}$  का और आधार धारा में  $15\text{ }\mu\text{A}$  का परिवर्तन होता है। निवेश प्रतिरोध तथा वोल्टेज लब्धि (gain) के मान होंगे :

**Options :**

41652953986.  $0.33\text{ k}\Omega, 300$

41652953987.  $0.33\text{ k}\Omega, 1.5$

41652953988.  $0.67\text{ k}\Omega, 300$

41652953989.  $0.67\text{ k}\Omega, 200$

**Question Number : 28 Question Id : 41652913803 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

A signal  $A\cos\omega t$  is transmitted using  $v_0 \sin\omega_0 t$  as carrier wave. The correct amplitude modulated (AM) signal is :

**Options :**

41652953990.  $v_0 \sin\omega_0 t + A\cos\omega t$

41652953991.  $(v_0 + A)\cos\omega t \sin\omega_0 t$

41652953992.  $v_0 \sin\omega_0 t + \frac{A}{2} \sin(\omega_0 - \omega)t + \frac{A}{2} \sin(\omega_0 + \omega)t$

41652953993.  $v_0 \sin[\omega_0(1 + 0.01A\sin\omega)t]$

**Question Number : 28 Question Id : 41652913803 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

एक सिग्नल  $A\cos\omega t$  का संचार वाहक तरंग  $v_0 \sin\omega_0 t$  से किया जाता है। सही आयाम मॉडुलित सिग्नल होगा :

**Options :**

41652953990.  $v_0 \sin\omega_0 t + A\cos\omega t$

41652953991.  $(v_0 + A)\cos\omega t \sin\omega_0 t$

41652953992.  $v_0 \sin\omega_0 t + \frac{A}{2} \sin(\omega_0 - \omega)t + \frac{A}{2} \sin(\omega_0 + \omega)t$

41652953993.  $v_0 \sin[\omega_0(1 + 0.01A \sin\omega t)t]$

**Question Number : 29 Question Id : 41652913804 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

If 'M' is the mass of water that rises in a capillary tube of radius 'r', then mass of water which will rise in a capillary tube of radius '2r' is :

**Options :**

41652953994.  $4 M$

41652953995.  $2 M$

41652953996.  $M$

41652953997.  $\frac{M}{2}$

**Question Number : 29 Question Id : 41652913804 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

यदि एक 'r' त्रिज्या की केशिका नली में चढ़े हुए पानी का द्रव्यमान 'M' है तो '2r' त्रिज्या की केशिका नली में चढ़ने वाले पानी का द्रव्यमान होगा :

**Options :**

41652953994.  $4 M$

41652953995.  $2 M$

41652953996.  $M$

41652953997.  $\frac{M}{2}$

**Question Number : 30 Question Id : 41652913805 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

A moving coil galvanometer has resistance  $50\ \Omega$  and it indicates full deflection at  $4\text{ mA}$  current. A voltmeter is made using this galvanometer and a  $5\text{ k}\Omega$  resistance. The maximum voltage, that can be measured using this voltmeter, will be close to :

**Options :**

41652953998, **10 V**

41652953999, **15 V**

41652954000, **20 V**

41652954001, **40 V**

**Question Number : 30 Question Id : 41652913805 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

एक चल कुंडली धारामापी का प्रतिरोध  $50\ \Omega$  है तथा यह  $4\text{ mA}$  धारा से पूर्ण विक्षेप दिखाता है। इसे  $5\text{ k}\Omega$  प्रतिरोध का उपयोग करके एक वोल्टमीटर बनाते हैं। इस वोल्टमीटर से अधिकतम नापे जा सकने वाले वोल्टेज का निकटतम मान होगा :

**Options :**

41652953998, **10 V**

41652953999, **15 V**

41652954000, **20 V**

41652954001, **40 V**

Chemistry

**Section Id :**

416529287

**Section Number :**

2

**Section type :**

Online

**Mandatory or Optional:**

Mandatory

**Number of Questions:**

30

**Number of Questions to be attempted:**

30

**Section Marks:**

120

**Display Number Panel:**

Yes

Group All Questions:

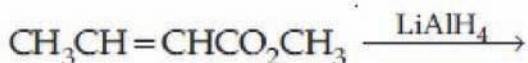
No

Sub-Section Number: 1  
Sub-Section Id: 416529427  
Question Shuffling Allowed : Yes

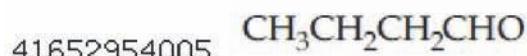
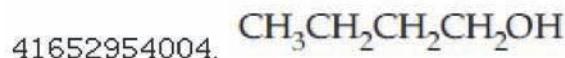
Question Number : 31 Question Id : 41652913806 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction  
is :



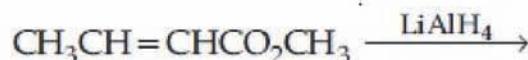
Options :



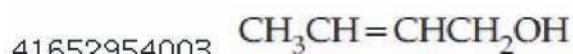
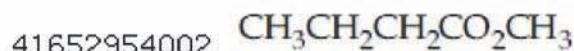
Question Number : 31 Question Id : 41652913806 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :



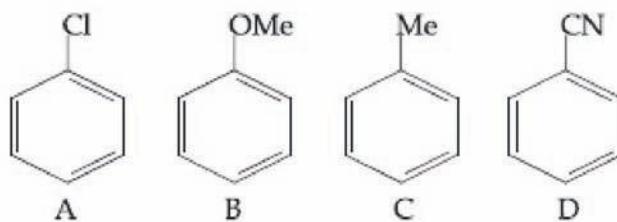
Options :



Question Number : 32 Question Id : 41652913807 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The increasing order of reactivity of the following compounds towards aromatic electrophilic substitution reaction is :



Options :

41652954006.  $A < B < C < D$

41652954007.  $D < A < C < B$

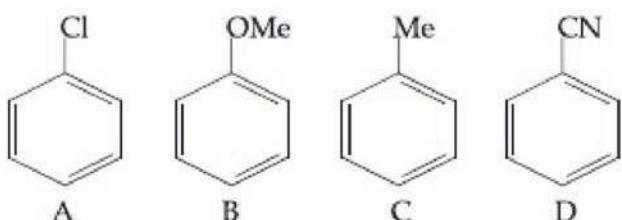
41652954008.  $D < B < A < C$

41652954009.  $B < C < A < D$

Question Number : 32 Question Id : 41652913807 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित यौगिकों के ऐरोमैटिक इलेक्ट्रॉनस्नेही प्रतिस्थापन अभिक्रिया के लिए अभिक्रियाशीलता का बढ़ता क्रम है :



Options :

41652954006.  $A < B < C < D$

41652954007.  $D < A < C < B$

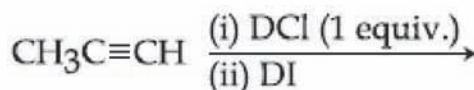
41652954008.  $D < B < A < C$

41652954009.  $B < C < A < D$

Question Number : 33 Question Id : 41652913808 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :



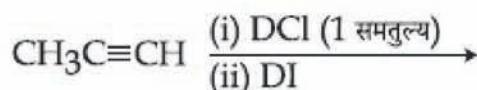
Options :



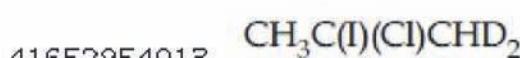
Question Number : 33 Question Id : 41652913808 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :



Options :



Question Number : 34 Question Id : 41652913809 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Which of the following statements is not true about sucrose ?

Options :

On hydrolysis, it produces glucose and fructose

41652954014.

It is a non reducing sugar

41652954015.

The glycosidic linkage is present between C<sub>1</sub> of α-glucose and C<sub>1</sub> of β-fructose

41652954016.

It is also named as invert sugar

41652954017.

Question Number : 34 Question Id : 41652913809 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

सुक्रोस के संबंध में निम्नलिखित में से कौन-सा कथन सही नहीं है?

Options :

जल अपघटित होने पर, यह ग्लूकोस तथा फ्रक्टोज बनाता है।

41652954014.

यह एक अनअपचायी शर्करा है।

α-ग्लूकोस के C<sub>1</sub> तथा β-फ्रक्टोज के C<sub>1</sub> के

बीच ग्लाइकोसाइडी बंध होता है।

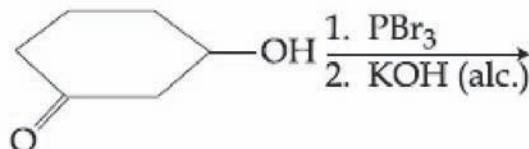
यह एक अपवृत्त शर्करा की तरह भी जाना जाता

है।

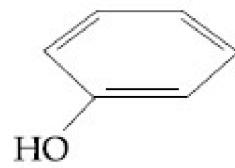
Question Number : 35 Question Id : 41652913810 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The major product of the following reaction is :

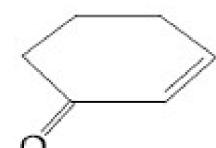


Options :



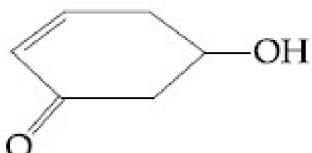
HO

41652954018.

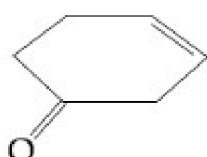


O

41652954019.



41652954020.

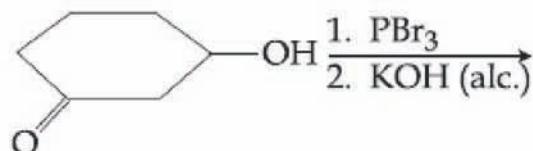


41652954021.

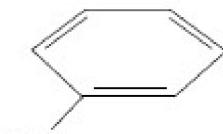
Question Number : 35 Question Id : 41652913810 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

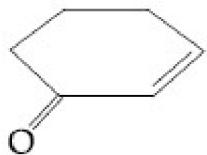
निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :



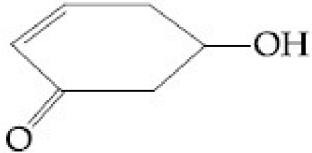
Options :



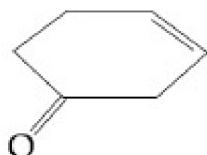
41652954018.



41652954019.



41652954020.

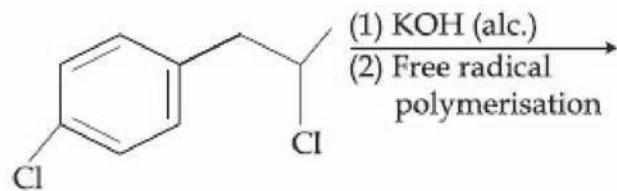


41652954021.

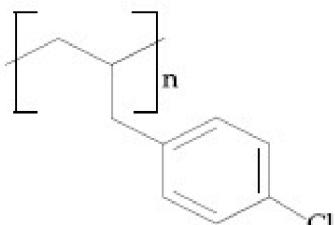
Question Number : 36 Question Id : 41652913811 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

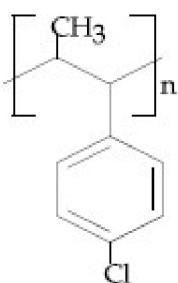
The major product of the following reaction is :



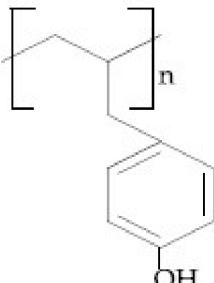
Options :



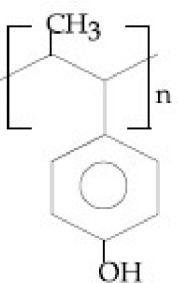
41652954022.



41652954023.



41652954024.

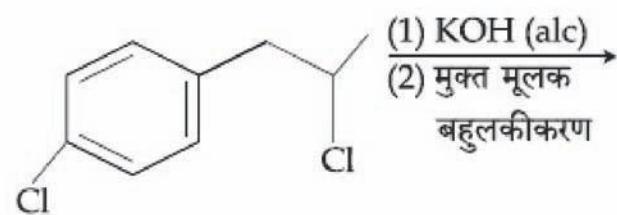


41652954025.

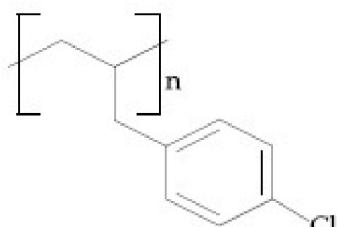
Question Number : 36 Question Id : 41652913811 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

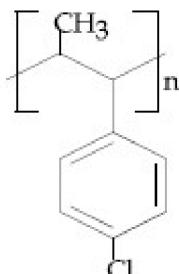
निम्नलिखित अभिक्रिया का मुख्य उत्पाद है :



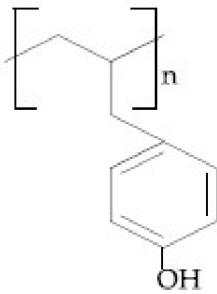
Options :



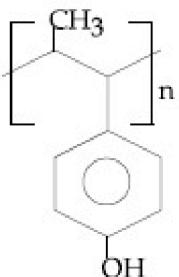
41652954022.



41652954023.



41652954024.

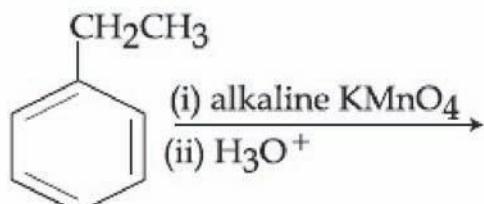


41652954025.

Question Number : 37 Question Id : 41652913812 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

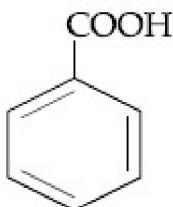
The major product of the following reaction is :



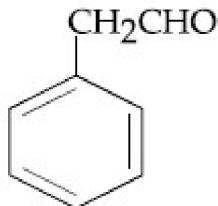
Options :



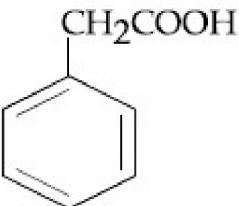
41652954026.



41652954027.



41652954028.

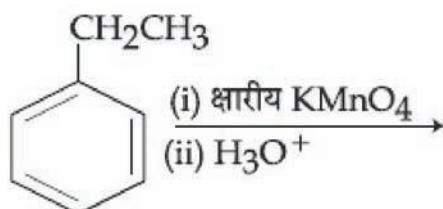


41652954029.

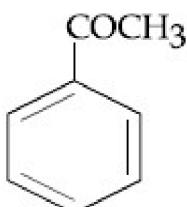
Question Number : 37 Question Id : 41652913812 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

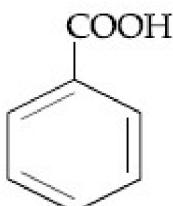
निम्न अभिक्रिया का मुख्य उत्पाद है :



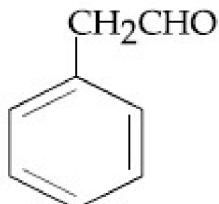
Options :



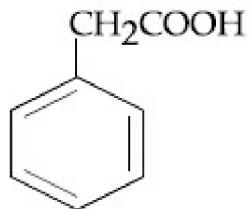
41652954026.



41652954027.



41652954028.



41652954029.

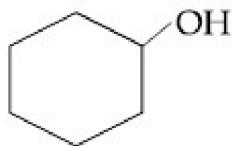
Question Number : 38 Question Id : 41652913813 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

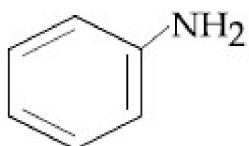
The organic compound that gives following qualitative analysis is :

Test	Inference
(a) Dil. HCl	Insoluble
(b) NaOH solution	soluble
(c) Br <sub>2</sub> /water	Decolourization

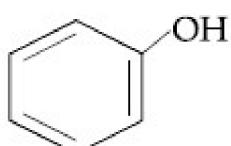
Options :



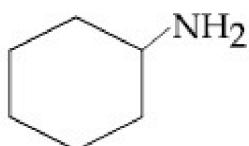
41652954030.



41652954031.



41652954032.



41652954033.

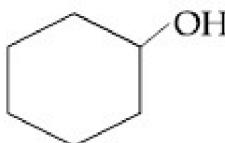
Question Number : 38 Question Id : 41652913813 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

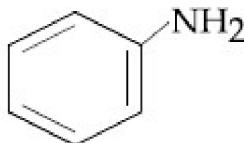
कार्बनिक यौगिक जो निम्नलिखित गुणात्मक विश्लेषण  
देता है, वह है :

- |                         |                                |
|-------------------------|--------------------------------|
| परीक्षण                 | अनुमान                         |
| (a) तनु HCl             | अधुलनशील                       |
| (b) NaOH विलयन          | धुलनशील                        |
| (c) Br <sub>2</sub> /जल | रंग का लुप्त होना<br>(विवर्णन) |

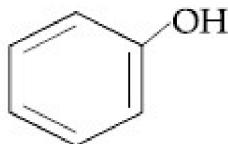
Options :



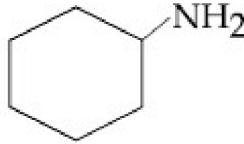
41652954030.



41652954031.



41652954032.

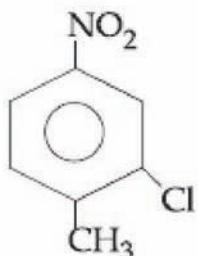


41652954033.

Question Number : 39 Question Id : 41652913814 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The correct IUPAC name of the following compound is :



Options :

41652954034. 5-chloro-4-methyl-1-nitrobenzene

41652954035. 2-chloro-1-methyl-4-nitrobenzene

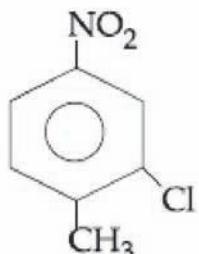
41652954036. 2-methyl-5-nitro-1-chlorobenzene

41652954037. 3-chloro-4-methyl-1-nitrobenzene

Question Number : 39 Question Id : 41652913814 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित यौगिक का सही IUPAC नाम है :



Options :

41652954034. 5-क्लोरो-4-मेथिल-1-नाइट्रोबेन्जीन

41652954035. 2-क्लोरो-1-मेथिल-4-नाइट्रोबेन्जीन

41652954036. 2-मेथिल-5-नाइट्रो-1-क्लोरोबेन्जीन

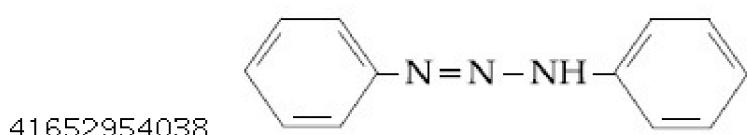
41652954037. 3-क्लोरो-4-मेथिल-1-नाइट्रोबेन्जीन

Question Number : 40 Question Id : 41652913815 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

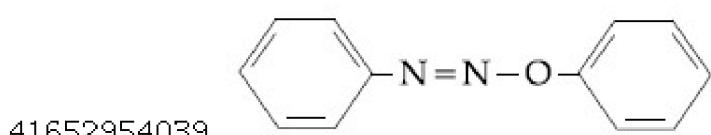
Correct Marks : 4 Wrong Marks : 1

Aniline dissolved in dilute HCl is reacted with sodium nitrite at 0°C . This solution was added dropwise to a solution containing equimolar mixture of aniline and phenol in dil. HCl. The structure of the major product is :

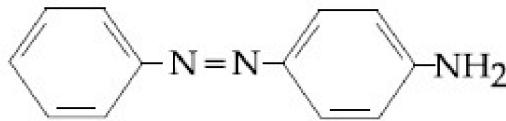
Options :



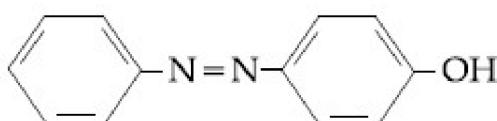
41652954038.



41652954039.



41652954040.



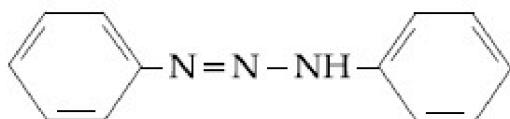
41652954041.

Question Number : 40 Question Id : 41652913815 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

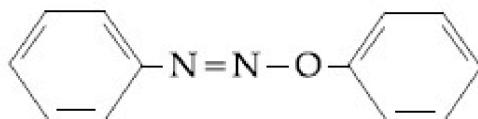
Correct Marks : 4 Wrong Marks : 1

तनु HCl में घुली हुई ऐनिलीन को सोडियम नाइट्राइट के साथ 0°C पर अभिक्रियित किया जाता है। इस विलयन को ऐनिलीन तथा फिनॉल के सममोलीय मिश्रण के तनु HCl विलयन में बूंद-बूंद करके मिलाया जाता है। मुख्य उत्पाद की संरचना है :

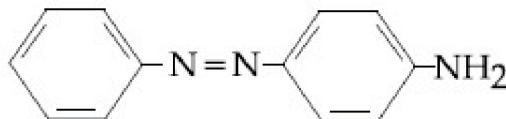
Options :



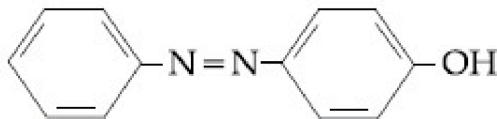
41652954038.



41652954039.



41652954040.



41652954041.

Question Number : 41 Question Id : 41652913816 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The element having greatest difference between its first and second ionization energies, is :

Options :

41652954042. K

41652954043. Ca

41652954044. Ba

41652954045. Sc

Question Number : 41 Question Id : 41652913816 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

प्रथम तथा द्वितीय आयन ऊर्जाओं के बीच सर्वाधिक  
अन्तर जिस तत्व में है, वह है :

Options :

41652954042. K

41652954043. Ca

41652954044. Ba

41652954045. Sc

Question Number : 42 Question Id : 41652913817 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The ore that contains the metal in the  
form of fluoride is :

Options :

41652954046. sphalerite

41652954047. cryolite

41652954048. magnetite

41652954049. malachite

Question Number : 42 Question Id : 41652913817 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अयस्क जिसमें धातु फ्लोराइड के रूप में है, वह है :

Options :

41652954046. स्फैलेराइट

41652954047. क्राइयोलाइट

41652954048. मैग्नेटाइट

41652954049. मैलेकाइट

**Question Number : 43 Question Id : 41652913818 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

The number of water molecule(s) not coordinated to copper ion directly in  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$ , is :

**Options :**

41652954050. 1

41652954051. 2

41652954052. 3

41652954053. 4

**Question Number : 43 Question Id : 41652913818 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

$\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  में, कॉपर आयन के साथ सीधे रूप से उपसहसंयोजित नहीं होने वाला/वाले जल के अणु(ओं) की संख्या है :

**Options :**

41652954050. 1

41652954051. 2

41652954052. 3

41652954053. 4

**Question Number : 44 Question Id : 41652913819 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

Magnesium powder burns in air to give :

**Options :**

41652954054. MgO only

41652954055.  $\text{Mg}(\text{NO}_3)_2$  and  $\text{Mg}_3\text{N}_2$

41652954056.  $\text{MgO}$  and  $\text{Mg}_3\text{N}_2$

41652954057.  $\text{MgO}$  and  $\text{Mg}(\text{NO}_3)_2$

**Question Number : 44 Question Id : 41652913819 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

मैग्नीशियम पाउडर वायु में जलकर देता है :

**Options :**

41652954054.  $\text{MgO}$  मात्र

41652954055.  $\text{Mg}(\text{NO}_3)_2$  तथा  $\text{Mg}_3\text{N}_2$

41652954056.  $\text{MgO}$  तथा  $\text{Mg}_3\text{N}_2$

41652954057.  $\text{MgO}$  तथा  $\text{Mg}(\text{NO}_3)_2$

**Question Number : 45 Question Id : 41652913820 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

The correct order of the oxidation states of nitrogen in  $\text{NO}$ ,  $\text{N}_2\text{O}$ ,  $\text{NO}_2$  and  $\text{N}_2\text{O}_3$  is :

**Options :**

41652954058.  $\text{NO}_2 < \text{NO} < \text{N}_2\text{O}_3 < \text{N}_2\text{O}$

41652954059.  $\text{NO}_2 < \text{N}_2\text{O}_3 < \text{NO} < \text{N}_2\text{O}$

41652954060.  $\text{N}_2\text{O} < \text{NO} < \text{N}_2\text{O}_3 < \text{NO}_2$

41652954061.  $\text{N}_2\text{O} < \text{N}_2\text{O}_3 < \text{NO} < \text{NO}_2$

**Question Number : 45 Question Id : 41652913820 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

$\text{NO}$ ,  $\text{N}_2\text{O}$ ,  $\text{NO}_2$  तथा  $\text{N}_2\text{O}_3$  में नाइट्रोजन की औक्सीकरण अवस्थाओं का सही क्रम है :

**Options :**

41652954058.  $\text{NO}_2 < \text{NO} < \text{N}_2\text{O}_3 < \text{N}_2\text{O}$

41652954059.  $\text{NO}_2 < \text{N}_2\text{O}_3 < \text{NO} < \text{N}_2\text{O}$

41652954060.  $\text{N}_2\text{O} < \text{NO} < \text{N}_2\text{O}_3 < \text{NO}_2$

41652954061.  $\text{N}_2\text{O} < \text{N}_2\text{O}_3 < \text{NO} < \text{NO}_2$

**Question Number : 46 Question Id : 41652913821 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

$\text{C}_{60}$ , an allotrope of carbon contains :

**Options :**

41652954062. 20 hexagons and 12 pentagons.

41652954063. 12 hexagons and 20 pentagons.

41652954064. 16 hexagons and 16 pentagons.

41652954065. 18 hexagons and 14 pentagons.

**Question Number : 46 Question Id : 41652913821 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

कार्बन के एक अपररूप  $\text{C}_{60}$  में होते हैं :

**Options :**

41652954062. 20 षट्भुज तथा 12 पंचभुज

41652954063. 12 षट्भुज तथा 20 पंचभुज

41652954064. 16 षट्भुज तथा 16 पंचभुज

41652954065. 18 षट्भुज तथा 14 पंचभुज

**Question Number : 47 Question Id : 41652913822 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

Match the catalysts (Column I) with products (Column II).

Column I	Column II
Catalyst	Product
(A) $V_2O_5$	(i) Polyethylene
(B) $TiCl_4/Al(Me)_3$	(ii) ethanal
(C) $PdCl_2$	(iii) $H_2SO_4$
(D) Iron Oxide	(iv) $NH_3$

Options :

41652954066. (A)-(ii); (B)-(iii); (C)-(i); (D)-(iv)

41652954067. (A)-(iv); (B)-(iii); (C)-(ii); (D)-(i)

41652954068. (A)-(iii); (B)-(iv); (C)-(i); (D)-(ii)

41652954069. (A)-(iii); (B)-(i); (C)-(ii); (D)-(iv)

Question Number : 47 Question Id : 41652913822 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

उत्प्रेरकों (कालम I) को उत्पादों (कालम II) के साथ सुमेलित कीजिए :

कालम I	कालम II
उत्प्रेरक	उत्पाद
(A) $V_2O_5$	(i) पालिथीन
(B) $TiCl_4/Al(Me)_3$	(ii) एथेनल
(C) $PdCl_2$	(iii) $H_2SO_4$
(D) आयरन आक्साइड	(iv) $NH_3$

Options :

41652954066. (A)-(ii); (B)-(iii); (C)-(i); (D)-(iv)

41652954067. (A)-(iv); (B)-(iii); (C)-(ii); (D)-(i)

41652954068. (A)-(iii); (B)-(iv); (C)-(i); (D)-(ii)

41652954069. (A)-(iii); (B)-(i); (C)-(ii); (D)-(iv)

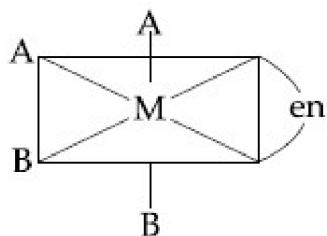
Question Number : 48 Question Id : 41652913823 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

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

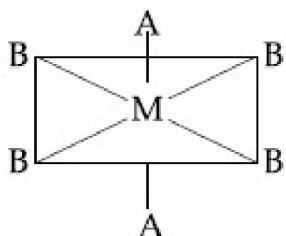
The one that will show optical activity is :

(en = ethane-1,2-diamine)

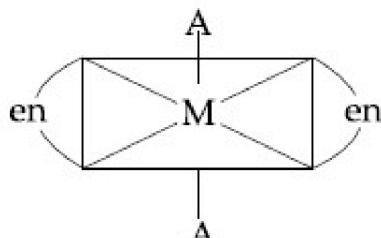
Options :



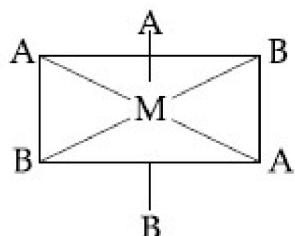
41652954070.



41652954071.



41652954072.



41652954073.

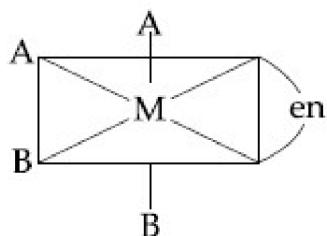
**Question Number : 48 Question Id : 41652913823 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

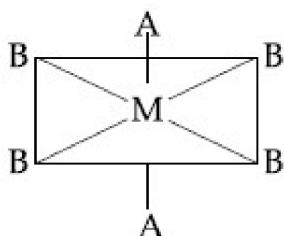
जो ध्रुवण धूर्णकता प्रदर्शित करता है वह है :

(en = एथेन-1,2-डाइऐमीन)

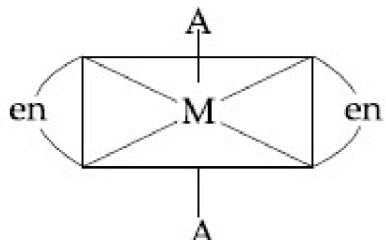
Options :



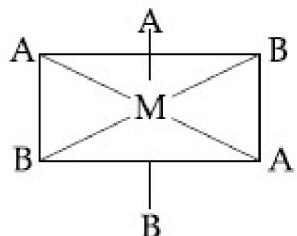
41652954070.



41652954071.



41652954072.



41652954073.

**Question Number : 49 Question Id : 41652913824 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

The degenerate orbitals of  $[\text{Cr}(\text{H}_2\text{O})_6]^{3+}$

are :

**Options :**

41652954074.  $d_{x^2-y^2}$  and  $d_{xy}$

41652954075.  $d_{xz}$  and  $d_{yz}$

41652954076.  $d_{z^2}$  and  $d_{xz}$

41652954077.  $d_{yz}$  and  $d_{z^2}$

**Question Number : 49 Question Id : 41652913824 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

$[\text{Cr}(\text{H}_2\text{O})_6]^{3+}$  के अपहासित कक्षक हैं :

**Options :**

41652954074.  $d_{x^2-y^2}$  तथा  $d_{xy}$

41652954075.  $d_{xz}$  तथा  $d_{yz}$

41652954076.  $d_{z^2}$  तथा  $d_{xz}$

41652954077.  $d_{yz}$  तथा  $d_{z^2}$

Question Number : 50 Question Id : 41652913825 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Excessive release of  $\text{CO}_2$  into the atmosphere results in :

Options :

41652954078. depletion of ozone

41652954079. formation of smog

41652954080. global warming

41652954081. polar vortex

Question Number : 50 Question Id : 41652913825 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

पर्यावरण में  $\text{CO}_2$  का अत्यधिक निस्पर्जन का परिणाम है :

Options :

41652954078. ओजोन का अवक्षय

41652954079. धूमकुहा का बनना

41652954080. भूमंडलीय तापन

41652954081. ध्रुवीय भ्रमिल (vortex)

Question Number : 51 Question Id : 41652913826 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

For a reaction,

$\text{N}_2(\text{g}) + 3 \text{H}_2(\text{g}) \rightarrow 2 \text{NH}_3(\text{g})$  ; identify dihydrogen ( $\text{H}_2$ ) as a limiting reagent in the following reaction mixtures.

Options :

41652954082.  $14 \text{ g of N}_2 + 4 \text{ g of H}_2$

41652954083.  $28 \text{ g of N}_2 + 6 \text{ g of H}_2$

41652954084.  $35 \text{ g of N}_2 + 8 \text{ g of H}_2$

41652954085.  $56 \text{ g of N}_2 + 10 \text{ g of H}_2$

Question Number : 51 Question Id : 41652913826 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अभिक्रिया

$\text{N}_2(\text{g}) + 3 \text{H}_2(\text{g}) \rightarrow 2 \text{NH}_3(\text{g})$  के लिए  
निम्नलिखित अभिक्रियात्मक मिश्रणों में डाइहाइड्रोजन  
( $\text{H}_2$ ) को सीमांत अभिकर्मक के रूप में पहचानिये :

Options :

41652954082.  $\text{N}_2$  का 14 g +  $\text{H}_2$  का 4 g

41652954083.  $\text{N}_2$  का 28 g +  $\text{H}_2$  का 6 g

41652954084.  $\text{N}_2$  का 35 g +  $\text{H}_2$  का 8 g

41652954085.  $\text{N}_2$  का 56 g +  $\text{H}_2$  का 10 g

Question Number : 52 Question Id : 41652913827 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Consider the van der Waals constants, a  
and b, for the following gases.

Gas	Ar	Ne	Kr	Xe
a/(atm dm <sup>6</sup> mol <sup>-2</sup> )	1.3	0.2	5.1	4.1
b/(10 <sup>-2</sup> dm <sup>3</sup> mol <sup>-1</sup> )	3.2	1.7	1.0	5.0

Which gas is expected to have the highest  
critical temperature ?

Options :

41652954086. Ar

41652954087. Ne

41652954088. Kr

41652954089. Xe

Question Number : 52 Question Id : 41652913827 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित गैसों के वान्डरवाल्स स्थिरांक a तथा b  
पर विचार कीजिए :

गैस	Ar	Ne	Kr	Xe
a/(atm dm <sup>6</sup> mol <sup>-2</sup> )	1.3	0.2	5.1	4.1
b/(10 <sup>-2</sup> dm <sup>3</sup> mol <sup>-1</sup> )	3.2	1.7	1.0	5.0

निम्नलिखित में से किसके लिए क्रांतिक ताप के सर्वाधिक होने की संभावना होगी ?

Options :

41652954086. Ar

41652954087. Ne

41652954088. Kr

41652954089. Xe

Question Number : 53 Question Id : 41652913828 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

For any given series of spectral lines of atomic hydrogen, let

$\Delta\bar{\nu} = \bar{\nu}_{\text{max}} - \bar{\nu}_{\text{min}}$  be the difference in maximum and minimum frequencies in  $\text{cm}^{-1}$ . The ratio  $\Delta\bar{\nu}_{\text{Lyman}} / \Delta\bar{\nu}_{\text{Balmer}}$  is :

Options :

41652954090. 27 : 5

41652954091. 4 : 1

41652954092. 9 : 4

41652954093. 5 : 4

Question Number : 53 Question Id : 41652913828 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

परमाणु हाइड्रोजन के स्पेक्ट्रल रेखाओं की दी गई शृंखलाओं के लिए यदि उच्चतम तथा निम्नतम आवृत्तियों में अन्तर  $\Delta\bar{\nu} = \bar{\nu}_{\text{max}} - \bar{\nu}_{\text{min}}$  ( $\text{cm}^{-1}$  में) है तो अनुपात  $\Delta\bar{\nu}_{\text{Lyman}} / \Delta\bar{\nu}_{\text{Balmer}}$  होगा :

Options :

41652954090. 27 : 5

41652954091. 4 : 1

41652954092. 9 : 4

41652954093. 5 : 4

Question Number : 54 Question Id : 41652913829 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Among the following, the molecule expected to be stabilized by anion formation is :

$\text{C}_2, \text{O}_2, \text{NO}, \text{F}_2$

Options :

41652954094.  $\text{O}_2$

41652954095.  $\text{C}_2$

41652954096.  $\text{NO}$

41652954097.  $\text{F}_2$

Question Number : 54 Question Id : 41652913829 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित में से, अणु जिसकी ऋणायन बनकर स्थायीकृत होने की संभावना है, वह है :

$\text{C}_2, \text{O}_2, \text{NO}, \text{F}_2$

Options :

41652954094.  $\text{O}_2$

41652954095.  $C_2$

41652954096. NO

41652954097.  $F_2$

Question Number : 55 Question Id : 41652913830 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Among the following, the set of parameters  
that represents path functions, is :

- (A)  $q + w$
- (B)  $q$
- (C)  $w$
- (D)  $H - TS$

Options :

41652954098. (A) and (D)

41652954099. (B) and (C)

41652954100. (B), (C) and (D)

41652954101. (A), (B) and (C)

Question Number : 55 Question Id : 41652913830 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

निम्नलिखित में से, प्राचलों का वह समुच्य जो पथ  
फलनों को दर्शाता है, वह है :

- (A)  $q + w$
- (B)  $q$
- (C)  $w$
- (D)  $H - TS$

Options :

41652954098. (A) तथा (D)

41652954099. (B) तथा (C)

41652954100. (B), (C) तथा (D)

(A), (B) तथा (C)

41652954101.

Question Number : 56 Question Id : 41652913831 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Liquid 'M' and liquid 'N' form an ideal solution. The vapour pressures of pure liquids 'M' and 'N' are 450 and 700 mmHg, respectively, at the same temperature. Then correct statement is :

( $x_M$  = Mole fraction of 'M' in solution;

$x_N$  = Mole fraction of 'N' in solution;

$y_M$  = Mole fraction of 'M' in vapour phase;

$y_N$  = Mole fraction of 'N' in vapour phase)

Options :

$$\frac{x_M}{x_N} = \frac{y_M}{y_N}$$

41652954102.

$$\frac{x_M}{x_N} > \frac{y_M}{y_N}$$

41652954103.

$$\frac{x_M}{x_N} < \frac{y_M}{y_N}$$

41652954104.

$$(x_M - y_M) < (x_N - y_N)$$

Question Number : 56 Question Id : 41652913831 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

द्रव 'M' तथा द्रव 'N' एक आदर्श विलयन बनाते हैं। शुद्ध द्रव 'M' तथा 'N' के वाष्प दाब उसी ताप पर क्रमशः 450 तथा 700 mmHg हैं तो सही कथन है :

जहाँ  $x_M$  = विलयन में 'M' का मोलर अंश ;

$x_N$  = विलयन में 'N' का मोलर अंश ;

$y_M$  = वाष्प अवस्था में 'M' का मोलर अंश ;

$y_N$  = वाष्प अवस्था में 'N' का मोलर अंश ;

Options :

$$\frac{x_M}{x_N} = \frac{y_M}{y_N}$$

41652954102.

$$\frac{x_M}{x_N} > \frac{y_M}{y_N}$$

41652954103.

$$\frac{x_M}{x_N} < \frac{y_M}{y_N}$$

41652954104.

$$41652954105. (x_M - y_M) < (x_N - y_N)$$

Question Number : 57 Question Id : 41652913832 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The osmotic pressure of a dilute solution of an ionic compound XY in water is four times that of a solution of 0.01 M BaCl<sub>2</sub> in water. Assuming complete dissociation of the given ionic compounds in water, the concentration of XY (in mol L<sup>-1</sup>) in solution is :

Options :

41652954106.  $4 \times 10^{-2}$

41652954107.  $16 \times 10^{-4}$

41652954108.  $6 \times 10^{-2}$

41652954109.  $4 \times 10^{-4}$

Question Number : 57 Question Id : 41652913832 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

जल में एक आयनिक यौगिक XY के तनु विलयन का परासरणीय दाब, 0.01 M BaCl<sub>2</sub> के जल में विलयन के परासरणीय दाब का चार गुना है। दिए गये आयनिक यौगिकों का जल में वियोजन पूर्ण मानते हुए, विलयन में XY की सांद्रता (mol L<sup>-1</sup> में) होगी :

Options :

41652954106.  $4 \times 10^{-2}$

41652954107.  $16 \times 10^{-4}$

41652954108.  $6 \times 10^{-2}$

41652954109.  $4 \times 10^{-4}$

**Question Number : 58 Question Id : 41652913833 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

The standard Gibbs energy for the given cell reaction in  $\text{kJ mol}^{-1}$  at 298 K is :



$$E^\circ = 2 \text{ V at } 298 \text{ K}$$

(Faraday's constant,  $F = 96000 \text{ C mol}^{-1}$ )

**Options :**

41652954110. 192

41652954111. 384

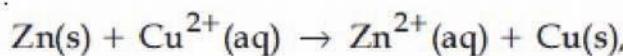
41652954112. -384

41652954113. -192

**Question Number : 58 Question Id : 41652913833 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

दिये गये सेल अभिक्रिया के लिए 298 K पर मानक गिब्स ऊर्जा ( $\text{kJ mol}^{-1}$  में) है :



$$298 \text{ K पर } E^\circ = 2 \text{ V}$$

(फैराडे स्थिरांक,  $F = 96000 \text{ C mol}^{-1}$ )

**Options :**

41652954110. 192

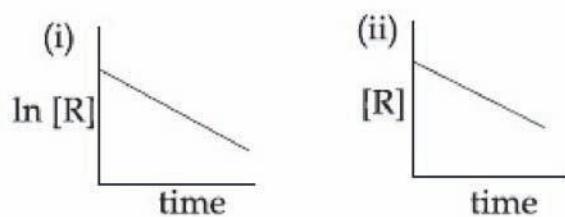
41652954111. 384

41652954112. -384

Question Number : 59 Question Id : 41652913834 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
 Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The given plots represent the variation of the concentration of a reactant R with time for two different reactions (i) and (ii). The respective orders of the reactions are :



Options :

41652954114. 0, 1

41652954115. 1, 0

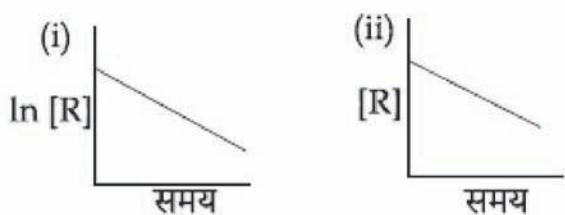
41652954116. 1, 1

41652954117. 0, 2

Question Number : 59 Question Id : 41652913834 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
 Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

नीचे दिये गये प्लाट, दो अभिक्रियाओं (i) तथा (ii) के लिए, अभिकर्मक R की सान्द्रता का समय के साथ होनेवाले परिवर्तन को निरूपित करते हैं। अभिक्रियाओं के क्रमिक कोटि हैं :



Options :

41652954114. 0, 1

41652954115. 1, 0

41652954116. 1, 1

41652954117. 0, 2

Question Number : 60 Question Id : 41652913835 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The aerosol is a kind of colloid in which :

Options :

41652954118. liquid is dispersed in water

41652954119. gas is dispersed in liquid

41652954120. gas is dispersed in solid

41652954121. solid is dispersed in gas

Question Number : 60 Question Id : 41652913835 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

एरोसॉल एक ऐसा कोलायड है, जिसमें :

Options :

41652954118. जल में द्रव परिक्षित है।

41652954119. द्रव में गैस परिक्षित है।

41652954120. ठोस में गैस परिक्षित है।

41652954121. गैस में ठोस परिक्षित है।

## Mathematics

Section Id :	416529288
Section Number :	3
Section type :	Online
Mandatory or Optional:	Mandatory
Number of Questions:	30
Number of Questions to be attempted:	30
Section Marks:	120
Display Number Panel:	Yes
Group All Questions:	No

**Sub-Section Number:** 1  
**Sub-Section Id:** 416529428  
**Question Shuffling Allowed :** Yes

**Question Number : 61 Question Id : 41652913836 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

If the function  $f: \mathbf{R} - \{1, -1\} \rightarrow A$  defined

by  $f(x) = \frac{x^2}{1-x^2}$ , is surjective, then A is

equal to :

**Options :**

41652954122.  $\mathbf{R} - [-1, 0)$

41652954123.  $\mathbf{R} - \{-1\}$

41652954124.  $\mathbf{R} - (-1, 0)$

41652954125.  $[0, \infty)$

**Question Number : 61 Question Id : 41652913836 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

यदि फलन  $f: \mathbf{R} - \{1, -1\} \rightarrow A$ ,  $f(x) = \frac{x^2}{1-x^2}$

द्वारा परिभाषित है तथा आच्छादी (surjective) है, तो

A बराबर है :

**Options :**

41652954122.  $\mathbf{R} - [-1, 0)$

41652954123.  $\mathbf{R} - \{-1\}$

41652954124.  $\mathbf{R} - (-1, 0)$

41652954125.  $[0, \infty)$

**Question Number : 62 Question Id : 41652913837 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

All the points in the set

$$S = \left\{ \frac{\alpha+i}{\alpha-i} : \alpha \in \mathbf{R} \right\} (i = \sqrt{-1}) \text{ lie on a :}$$

Options :

41652954126. circle whose radius is  $\sqrt{2}$ .

41652954127. circle whose radius is 1.

41652954128. straight line whose slope is 1.

41652954129. straight line whose slope is -1.

Question Number : 62 Question Id : 41652913837 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समुच्चय  $S = \left\{ \frac{\alpha+i}{\alpha-i} : \alpha \in \mathbf{R} \right\} (i = \sqrt{-1})$  के

सभी बिंदु जिस पर स्थित हैं; वह है :

Options :

41652954126. एक वृत्त जिसकी त्रिज्या  $\sqrt{2}$  है।

41652954127. एक वृत्त जिसकी त्रिज्या 1 है।

41652954128. एक सरल रेखा जिसकी ढाल (slope) 1 है।

41652954129. एक सरल रेखा जिसकी ढाल -1 है।

Question Number : 63 Question Id : 41652913838 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let  $p, q \in \mathbf{R}$ . If  $2 - \sqrt{3}$  is a root of the quadratic equation,  $x^2 + px + q = 0$ , then :

Options :

41652954130.  $p^2 - 4q + 12 = 0$

41652954131.  $q^2 - 4p - 16 = 0$

41652954132.  $p^2 - 4q - 12 = 0$

$$q^2 + 4p + 14 = 0$$

41652954133.

Question Number : 63 Question Id : 41652913838 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना  $p, q \in \mathbb{R}$ , यदि  $2 - \sqrt{3}$  द्विघाती समीकरण

$x^2 + px + q = 0$  का एक मूल है, तो :

Options :

$$p^2 - 4q + 12 = 0$$

41652954131.  $q^2 - 4p - 16 = 0$

41652954132.  $p^2 - 4q - 12 = 0$

$$q^2 + 4p + 14 = 0$$

41652954133.

Question Number : 64 Question Id : 41652913839 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let  $\alpha$  and  $\beta$  be the roots of the equation

$x^2 + x + 1 = 0$ . Then for  $y \neq 0$  in  $\mathbb{R}$ ,

$$\begin{vmatrix} y+1 & \alpha & \beta \\ \alpha & y+\beta & 1 \\ \beta & 1 & y+\alpha \end{vmatrix}$$
 is equal to :

Options :

41652954134.  $y(y^2 - 3)$

41652954135.  $y^3 - 1$

41652954136.  $y(y^2 - 1)$

41652954137.  $y^3$

Question Number : 64 Question Id : 41652913839 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना  $\alpha$  तथा  $\beta$ , समीकरण  $x^2 + x + 1 = 0$  के मूल हैं,

तो  $\mathbb{R}$  में  $y \neq 0$  के लिए  $\begin{vmatrix} y+1 & \alpha & \beta \\ \alpha & y+\beta & 1 \\ \beta & 1 & y+\alpha \end{vmatrix}$  बराबर

है :

Options :

41652954134.  $y(y^2 - 3)$

41652954135.  $y^3 - 1$

41652954136.  $y(y^2 - 1)$

41652954137.  $y^3$

Question Number : 65 Question Id : 41652913840 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If

$$\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix} \cdots \begin{bmatrix} 1 & n-1 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 78 \\ 0 & 1 \end{bmatrix},$$

then the inverse of  $\begin{bmatrix} 1 & n \\ 0 & 1 \end{bmatrix}$  is :

Options :

41652954138.  $\begin{bmatrix} 1 & 0 \\ 12 & 1 \end{bmatrix}$

41652954139.  $\begin{bmatrix} 1 & 0 \\ 13 & 1 \end{bmatrix}$

41652954140.  $\begin{bmatrix} 1 & -13 \\ 0 & 1 \end{bmatrix}$

41652954141.  $\begin{bmatrix} 1 & -12 \\ 0 & 1 \end{bmatrix}$

Question Number : 65 Question Id : 41652913840 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि

$$\begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 1 & 2 \\ 0 & 1 \end{bmatrix} \cdot \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix} \cdots \cdots \cdots \begin{bmatrix} 1 & n-1 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 1 & 78 \\ 0 & 1 \end{bmatrix}$$

है, तो  $\begin{bmatrix} 1 & n \\ 0 & 1 \end{bmatrix}$  का व्युत्क्रम (inverse) है :

Options :

41652954138.  $\begin{bmatrix} 1 & 0 \\ 12 & 1 \end{bmatrix}$

41652954139.  $\begin{bmatrix} 1 & 0 \\ 13 & 1 \end{bmatrix}$

41652954140.  $\begin{bmatrix} 1 & -13 \\ 0 & 1 \end{bmatrix}$

41652954141.  $\begin{bmatrix} 1 & -12 \\ 0 & 1 \end{bmatrix}$

Question Number : 66 Question Id : 41652913841 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A committee of 11 members is to be formed from 8 males and 5 females. If m is the number of ways the committee is formed with at least 6 males and n is the number of ways the committee is formed with at least 3 females, then :

Options :

41652954142.  $n = m - 8$

41652954143.  $m = n = 78$

41652954144.  $m = n = 68$

41652954145.  $m + n = 68$

Question Number : 66 Question Id : 41652913841 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

8 पुरुषों तथा 5 महिलाओं में से 11 सदस्यों की एक कमेटी बनाई जानी है। यदि कम से कम 6 पुरुषों वाली कमेटी बनाने के  $m$  तरीके हैं तथा कम से कम 3 महिलाओं वाली कमेटी बनाने के  $n$  तरीके हैं, तो :

Options :

41652954142.  $n = m - 8$

41652954143.  $m = n = 78$

41652954144.  $m = n = 68$

41652954145.  $m + n = 68$

Question Number : 67 Question Id : 41652913842 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let the sum of the first  $n$  terms of a non-constant A.P.,  $a_1, a_2, a_3, \dots$  be

$$50n + \frac{n(n-7)}{2}A, \text{ where } A \text{ is a constant.}$$

If  $d$  is the common difference of this A.P., then the ordered pair  $(d, a_{50})$  is equal to :

Options :

41652954146.  $(50, 50 + 46A)$

41652954147.  $(A, 50 + 46A)$

41652954148.  $(A, 50 + 45A)$

41652954149.  $(50, 50 + 45A)$

Question Number : 67 Question Id : 41652913842 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना भिन्न पदों वाली समांतर श्रेढ़ी  
(non-constant A.P.)  $a_1, a_2, a_3, \dots$  के प्रथम

$n$  पदों का योगफल  $50n + \frac{n(n-7)}{2}A$  है, जहाँ

$A$  एक अचर है। यदि इस समांतर श्रेढ़ी का सार्वअंतर  $d$  है, तो क्रमित युग्म  $(d, a_{50})$  बराबर है :

Options :

41652954146. (50, 50 + 46A)

41652954147. (A, 50 + 46A)

41652954148. (A, 50 + 45A)

41652954149. (50, 50 + 45A)

**Question Number : 68 Question Id : 41652913843 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

Let  $\sum_{k=1}^{10} f(a+k) = 16(2^{10}-1)$ , where the

function  $f$  satisfies  $f(x+y) = f(x)f(y)$  for all natural numbers  $x, y$  and  $f(1) = 2$ . Then the natural number 'a' is :

**Options :**

41652954150. 2

41652954151. 3

41652954152. 4

41652954153. 16

**Question Number : 68 Question Id : 41652913843 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

माना  $\sum_{k=1}^{10} f(a+k) = 16(2^{10}-1)$  है, जहाँ सभी

प्राकृत संख्याओं  $x, y$  के लिए, फलन  $f$ ,  $f(x+y) = f(x)f(y)$  को संतुष्ट करता है तथा  $f(1) = 2$  है। तो प्राकृत संख्या 'a' बराबर है :

**Options :**

41652954150. 2

41652954151. 3

41652954152. 4

Question Number : 69 Question Id : 41652913844 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the fourth term in the Binomial expansion

of  $\left(\frac{2}{x} + x^{\log_8 x}\right)^6$  ( $x > 0$ ) is  $20 \times 8^7$ , then a value of  $x$  is :

Options :

41652954154.  $8^2$

41652954155.  $8$

41652954156.  $8^3$

41652954157.  $8^{-2}$

Question Number : 69 Question Id : 41652913844 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि  $\left(\frac{2}{x} + x^{\log_8 x}\right)^6$  ( $x > 0$ ) के द्वितीय प्रसार का

चौथा पद  $20 \times 8^7$  है, तो  $x$  का एक मान है :

Options :

41652954154.  $8^2$

41652954155.  $8$

41652954156.  $8^3$

41652954157.  $8^{-2}$

Question Number : 70 Question Id : 41652913845 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the function  $f$  defined on  $\left(\frac{\pi}{6}, \frac{\pi}{3}\right)$  by

$$f(x)=\begin{cases} \frac{\sqrt{2} \cos x - 1}{\cot x - 1}, & x \neq \frac{\pi}{4} \\ k, & x = \frac{\pi}{4} \end{cases}$$

is continuous, then  $k$  is equal to :

Options :

41652954158.  $\frac{2}{\sqrt{2}}$

41652954159.  $\frac{1}{2}$

41652954160.  $\frac{1}{\sqrt{2}}$

41652954161.  $\frac{1}{\sqrt{2}}$

Question Number : 70 Question Id : 41652913845 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि फलन  $f, \left(\frac{\pi}{6}, \frac{\pi}{3}\right)$  पर इस प्रकार परिभाषित है

$$\text{कि } f(x)=\begin{cases} \frac{\sqrt{2} \cos x - 1}{\cot x - 1}, & x \neq \frac{\pi}{4} \\ k, & x = \frac{\pi}{4} \end{cases}$$

संतत है, तो  $k$  बराबर है :

Options :

41652954158.  $\frac{2}{\sqrt{2}}$

41652954159.  $\frac{1}{2}$

41652954160.  $\frac{1}{\sqrt{2}}$

41652954161.  $\frac{1}{\sqrt{2}}$

Question Number : 71 Question Id : 41652913846 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let  $f(x) = 15 - |x - 10|$ ;  $x \in \mathbf{R}$ . Then the set of all values of  $x$ , at which the function,  $g(x) = f(f(x))$  is not differentiable, is :

Options :

41652954162. {10}

41652954163. {10, 15}

41652954164. {5, 10, 15}

41652954165. {5, 10, 15, 20}

Question Number : 71 Question Id : 41652913846 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना  $f(x) = 15 - |x - 10|$ ;  $x \in \mathbf{R}$  है, तो  $x$  के उन सभी मानों का समुच्चय, जिन पर फलन  $g(x) = f(f(x))$  अवकलनीय नहीं है, है :

Options :

41652954162. {10}

41652954163. {10, 15}

41652954164. {5, 10, 15}

41652954165. {5, 10, 15, 20}

Question Number : 72 Question Id : 41652913847 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let  $S$  be the set of all values of  $x$  for which the tangent to the curve  $y = f(x) = x^3 - x^2 - 2x$  at  $(x, y)$  is parallel to the line segment joining the points  $(1, f(1))$  and  $(-1, f(-1))$ , then  $S$  is equal to :

Options :

41652954166.  $\left\{\frac{1}{3}, 1\right\}$

$$\left\{\frac{1}{3}, -1\right\}$$

41652954167.

$$\left\{-\frac{1}{3}, -1\right\}$$

41652954168.

$$\left\{-\frac{1}{3}, 1\right\}$$

41652954169.

Question Number : 72 Question Id : 41652913847 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना  $S$ ,  $x$  के उन सभी मानों का समुच्चय है, जिन पर वक्र  $y = f(x) = x^3 - x^2 - 2x$  के बिंदु  $(x, y)$  पर खींची गई स्पर्श रेखा बिंदुओं  $(1, f(1))$  तथा  $(-1, f(-1))$  को मिलाने वाले रेखाखण्ड के समांतर है, तो  $S$  बराबर है :

Options :

$$\left\{\frac{1}{3}, 1\right\}$$

41652954166.

$$\left\{\frac{1}{3}, -1\right\}$$

41652954167.

$$\left\{-\frac{1}{3}, -1\right\}$$

41652954168.

$$\left\{-\frac{1}{3}, 1\right\}$$

41652954169.

Question Number : 73 Question Id : 41652913848 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If  $f(x)$  is a non-zero polynomial of degree four, having local extreme points at  $x = -1, 0, 1$ ; then the set

$$S = \{x \in \mathbb{R} : f(x) = f(0)\}$$

contains exactly :

Options :

two irrational and two rational numbers.

41652954170.

two irrational and one rational number.

41652954171.

four rational numbers.

41652954172.

four irrational numbers.

41652954173.

Question Number : 73 Question Id : 41652913848 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि  $f(x)$ , घात चार का एक शून्येतर बहुपद है, जिसके स्थानीय चरम बिंदु  $x = -1, 0, 1$  पर हैं, तो समुच्चय

$S = \{x \in \mathbb{R} : f(x) = f(0)\}$  में मात्र :

Options :

41652954170. दो अपरिमेय तथा दो परिमेय संख्याएँ हैं।

41652954171. दो अपरिमेय तथा एक परिमेय संख्या है।

41652954172. चार परिमेय संख्याएँ हैं।

41652954173. चार अपरिमेय संख्याएँ हैं।

Question Number : 74 Question Id : 41652913849 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The integral  $\int \sec^{2/3} x \csc^{4/3} x \, dx$  is

equal to :

(Here C is a constant of integration)

Options :

41652954174.  $-3 \cot^{-1/3} x + C$

41652954175.  $-3 \tan^{-1/3} x + C$

41652954176.  $-\frac{3}{4} \tan^{-4/3} x + C$

41652954177.  $3 \tan^{-1/3} x + C$

Question Number : 74 Question Id : 41652913849 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

समाकल  $\int \sec^{2/3} x \csc^{4/3} x dx$  बराबर है :

(यहाँ C एक समाकलन अचर है)

Options :

41652954174.  $-3 \cot^{-1/3} x + C$

41652954175.  $-3 \tan^{-1/3} x + C$

41652954176.  $-\frac{3}{4} \tan^{-4/3} x + C$

41652954177.  $3 \tan^{-1/3} x + C$

Question Number : 75 Question Id : 41652913850 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The value of  $\int_0^{\pi/2} \frac{\sin^3 x}{\sin x + \cos x} dx$  is :

Options :

41652954178.  $\frac{\pi-1}{2}$

41652954179.  $\frac{\pi-1}{4}$

41652954180.  $\frac{\pi-2}{8}$

41652954181.  $\frac{\pi-2}{4}$

Question Number : 75 Question Id : 41652913850 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$\int_0^{\pi/2} \frac{\sin^3 x}{\sin x + \cos x} dx$  का मान है :

Options :

41652954178.  $\frac{\pi-1}{2}$

41652954179.  $\frac{\pi-1}{4}$

41652954180.  $\frac{\pi-2}{8}$

41652954181.  $\frac{\pi-2}{4}$

Question Number : 76 Question Id : 41652913851 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The area (in sq. units) of the region

$A = \{(x, y) : x^2 \leq y \leq x + 2\}$  is :

Options :

41652954182.  $\frac{31}{6}$

41652954183.  $\frac{10}{3}$

41652954184.  $\frac{13}{6}$

41652954185.  $\frac{9}{2}$

Question Number : 76 Question Id : 41652913851 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

क्षेत्र  $A = \{(x, y) : x^2 \leq y \leq x + 2\}$  का क्षेत्रफल (वर्ग इकाइयों में) है :

Options :

41652954182.  $\frac{31}{6}$

$$\frac{10}{3}$$

41652954183.

$$\frac{13}{6}$$

41652954184.

$$\frac{9}{2}$$

41652954185.

Question Number : 77 Question Id : 41652913852 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The solution of the differential equation

$$x \frac{dy}{dx} + 2y = x^2 \quad (x \neq 0) \text{ with } y(1) = 1, \text{ is :}$$

Options :

$$y = \frac{3}{4}x^2 + \frac{1}{4x^2}$$

41652954186.

$$y = \frac{4}{5}x^3 + \frac{1}{5x^2}$$

41652954187.

$$y = \frac{x^2}{4} + \frac{3}{4x^2}$$

41652954188.

$$y = \frac{x^3}{5} + \frac{1}{5x^2}$$

41652954189.

Question Number : 77 Question Id : 41652913852 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

अवकल समीकरण  $x \frac{dy}{dx} + 2y = x^2 \quad (x \neq 0)$  का

हल जिसके लिए  $y(1) = 1$  है, है :

Options :

$$y = \frac{3}{4}x^2 + \frac{1}{4x^2}$$

41652954186.

$$y = \frac{4}{5}x^3 + \frac{1}{5x^2}$$

41652954187.

$$y = \frac{x^2}{4} + \frac{3}{4x^2}$$

41652954188.

$$y = \frac{x^3}{5} + \frac{1}{5x^2}$$

41652954189.

Question Number : 78 Question Id : 41652913853 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the tangent to the curve,  $y = x^3 + ax - b$  at the point  $(1, -5)$  is perpendicular to the line,  $-x + y + 4 = 0$ , then which one of the following points lies on the curve ?

Options :

41652954190.  $(2, -1)$

41652954191.  $(2, -2)$

41652954192.  $(-2, 1)$

41652954193.  $(-2, 2)$

Question Number : 78 Question Id : 41652913853 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि वक्र  $y = x^3 + ax - b$  के बिंदु  $(1, -5)$  पर खोंची गई स्पशिरिखा, रेखा  $-x + y + 4 = 0$  पर लंबवत है, तो निम्न में से कौन सा एक बिंदु, वक्र पर स्थित है?

Options :

41652954190.  $(2, -1)$

41652954191.  $(2, -2)$

41652954192.  $(-2, 1)$

41652954193.  $(-2, 2)$

Question Number : 79 Question Id : 41652913854 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Slope of a line passing through P(2, 3) and intersecting the line,  $x + y = 7$  at a distance of 4 units from P, is :

Options :

41652954194.  $\frac{\sqrt{5}-1}{\sqrt{5}+1}$

41652954195.  $\frac{1-\sqrt{5}}{1+\sqrt{5}}$

41652954196.  $\frac{\sqrt{7}-1}{\sqrt{7}+1}$

41652954197.  $\frac{1-\sqrt{7}}{1+\sqrt{7}}$

Question Number : 79 Question Id : 41652913854 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

P(2, 3) से हो कर जाने वाली एक रेखा, जो रेखा  $x + y = 7$  को P से 4 इकाई की दूरी पर प्रतिच्छेदित करती है, की ढाल (slope) है :

Options :

41652954194.  $\frac{\sqrt{5}-1}{\sqrt{5}+1}$

41652954195.  $\frac{1-\sqrt{5}}{1+\sqrt{5}}$

41652954196.  $\frac{\sqrt{7}-1}{\sqrt{7}+1}$

41652954197.  $\frac{1-\sqrt{7}}{1+\sqrt{7}}$

Question Number : 80 Question Id : 41652913855 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If a tangent to the circle  $x^2 + y^2 = 1$  intersects the coordinate axes at distinct points P and Q, then the locus of the mid-point of PQ is :

Options :

41652954198.  $x^2 + y^2 - 2xy = 0$

41652954199.  $x^2 + y^2 - 2x^2y^2 = 0$

41652954200.  $x^2 + y^2 - 4x^2y^2 = 0$

41652954201.  $x^2 + y^2 - 16x^2y^2 = 0$

Question Number : 80 Question Id : 41652913855 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि वृत्त  $x^2 + y^2 = 1$  की एक स्परिखा निर्देशांक अक्षों को भिन्न बिंदुओं P तथा Q पर प्रतिच्छेद करती है, तो PQ के मध्यबिंदु का बिंदुपथ (locus) है :

Options :

41652954198.  $x^2 + y^2 - 2xy = 0$

41652954199.  $x^2 + y^2 - 2x^2y^2 = 0$

41652954200.  $x^2 + y^2 - 4x^2y^2 = 0$

41652954201.  $x^2 + y^2 - 16x^2y^2 = 0$

Question Number : 81 Question Id : 41652913856 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If one end of a focal chord of the parabola,  $y^2 = 16x$  is at (1, 4), then the length of this focal chord is :

Options :

41652954202. 25

41652954203. 24

41652954204. 22

**Question Number : 81 Question Id : 41652913856 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

यदि परवलय  $y^2 = 16x$  की एक नाभिजीवा का एक छोर (1, 4) पर है, तो इस नाभिजीवा की लंबाई है :

**Options :**

41652954202. 25

41652954203. 24

41652954204. 22

41652954205. 20

**Question Number : 82 Question Id : 41652913857 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

If the line  $y = mx + 7\sqrt{3}$  is normal to the

hyperbola  $\frac{x^2}{24} - \frac{y^2}{18} = 1$ , then a value of

m is :

**Options :**

41652954206.  $\frac{2}{\sqrt{5}}$

41652954207.  $\frac{\sqrt{5}}{2}$

41652954208.  $\frac{3}{\sqrt{5}}$

41652954209.  $\frac{\sqrt{15}}{2}$

**Question Number : 82 Question Id : 41652913857 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical**

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

यदि रेखा  $y = mx + 7\sqrt{3}$ , अतिपरवलय

$\frac{x^2}{24} - \frac{y^2}{18} = 1$  का अभिलंब है, तो m का एक मान है :

Options :

41652954206.  $\frac{2}{\sqrt{5}}$

41652954207.  $\frac{\sqrt{5}}{2}$

41652954208.  $\frac{3}{\sqrt{5}}$

41652954209.  $\frac{\sqrt{15}}{2}$

Question Number : 83 Question Id : 41652913858 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the line,  $\frac{x-1}{2} = \frac{y+1}{3} = \frac{z-2}{4}$  meets the plane,  $x + 2y + 3z = 15$  at a point P, then the distance of P from the origin is :

Options :

41652954210.  $7/2$

41652954211.  $9/2$

41652954212.  $2\sqrt{5}$

41652954213.  $\sqrt{5}/2$

Question Number : 83 Question Id : 41652913858 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि रेखा  $\frac{x-1}{2} = \frac{y+1}{3} = \frac{z-2}{4}$ , समतल

$x + 2y + 3z = 15$  को बिंदु P पर मिलती है, तो P की मूल बिंदु से दूरी है :

Options :

41652954210. 7/2

41652954211. 9/2

41652954212.  $2\sqrt{5}$

41652954213.  $\sqrt{5}/2$

Question Number : 84 Question Id : 41652913859 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

A plane passing through the points  $(0, -1, 0)$  and  $(0, 0, 1)$  and making an angle

$\frac{\pi}{4}$  with the plane  $y - z + 5 = 0$ , also passes

through the point :

Options :

41652954214.  $(\sqrt{2}, -1, 4)$

41652954215.  $(-\sqrt{2}, -1, -4)$

41652954216.  $(-\sqrt{2}, 1, -4)$

41652954217.  $(\sqrt{2}, 1, 4)$

Question Number : 84 Question Id : 41652913859 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

बिंदुओं  $(0, -1, 0)$  तथा  $(0, 0, 1)$  से हो कर जाने वाला

एक समतल, जो समतल  $y - z + 5 = 0$  के साथ  $\frac{\pi}{4}$

का कोण बनाता है, निम्न में से किस बिंदु से होकर  
जाता है?

Options :

41652954214.  $(\sqrt{2}, -1, 4)$

41652954215.  $(-\sqrt{2}, -1, -4)$

41652954216.  $(-\sqrt{2}, 1, -4)$

41652954217.  $(\sqrt{2}, 1, 4)$

Question Number : 85 Question Id : 41652913860 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Let  $\vec{\alpha} = 3\hat{i} + \hat{j}$  and  $\vec{\beta} = 2\hat{i} - \hat{j} + 3\hat{k}$ . If

$\vec{\beta} = \vec{\beta}_1 - \vec{\beta}_2$ , where  $\vec{\beta}_1$  is parallel to  $\vec{\alpha}$

and  $\vec{\beta}_2$  is perpendicular to  $\vec{\alpha}$ , then

$\vec{\beta}_1 \times \vec{\beta}_2$  is equal to :

Options :

$$\frac{1}{2}(-3\hat{i} + 9\hat{j} + 5\hat{k})$$

41652954218.

$$\frac{1}{2}(3\hat{i} - 9\hat{j} + 5\hat{k})$$

41652954219.

$$-3\hat{i} + 9\hat{j} + 5\hat{k}$$

41652954220.

$$3\hat{i} - 9\hat{j} - 5\hat{k}$$

41652954221.

Question Number : 85 Question Id : 41652913860 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना  $\vec{\alpha} = 3\hat{i} + \hat{j}$  तथा  $\vec{\beta} = 2\hat{i} - \hat{j} + 3\hat{k}$  हैं। यदि

$\vec{\beta} = \vec{\beta}_1 - \vec{\beta}_2$  है, जहाँ  $\vec{\beta}_1$  सदिश  $\vec{\alpha}$  के समांतर है

तथा  $\vec{\beta}_2$  सदिश  $\vec{\alpha}$  के लंबवत है, तो  $\vec{\beta}_1 \times \vec{\beta}_2$   
बराबर है :

Options :

$$\frac{1}{2}(-3\hat{i} + 9\hat{j} + 5\hat{k})$$

41652954218.

$$\frac{1}{2}(3\hat{i} - 9\hat{j} + 5\hat{k})$$

41652954219.

$$-3\hat{i} + 9\hat{j} + 5\hat{k}$$

41652954220.

$$3\hat{i} - 9\hat{j} - 5\hat{k}$$

41652954221.

Question Number : 86 Question Id : 41652913861 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

Four persons can hit a target correctly with

probabilities  $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$  and  $\frac{1}{8}$  respectively.

If all hit at the target independently, then the probability that the target would be hit, is :

Options :

$$\frac{25}{32}$$

41652954222.

$$\frac{1}{192}$$

41652954223.

$$\frac{7}{32}$$

41652954224.

$$\frac{25}{192}$$

41652954225.

Question Number : 86 Question Id : 41652913861 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

चार व्यक्तियों के एक लक्ष्य पर ठीक प्रकार से प्रहर

करने की प्रायिकताएँ क्रमशः  $\frac{1}{2}, \frac{1}{3}, \frac{1}{4}$  तथा  $\frac{1}{8}$  हैं।

यदि सभी इस लक्ष्य पर स्वतंत्र रूप से प्रहर करते हैं, तो लक्ष्य पर आघात होने की प्रायिकता है :

Options :

$$\frac{25}{32}$$

41652954222.

41652954223.  $\frac{1}{192}$

41652954224.  $\frac{7}{32}$

41652954225.  $\frac{25}{192}$

Question Number : 87 Question Id : 41652913862 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

If the standard deviation of the numbers  
 $-1, 0, 1, k$  is  $\sqrt{5}$  where  $k > 0$ , then  $k$  is equal  
to :

Options :

41652954226.  $\sqrt{6}$

41652954227.  $2\sqrt{\frac{10}{3}}$

41652954228.  $2\sqrt{6}$

41652954229.  $4\sqrt{\frac{5}{3}}$

Question Number : 87 Question Id : 41652913862 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

यदि संख्याओं  $-1, 0, 1, k$  का मानक विचलन  $\sqrt{5}$  है,  
जहाँ  $k > 0$  है, तो  $k$  बराबर है :

Options :

41652954226.  $\sqrt{6}$

41652954227.  $2\sqrt{\frac{10}{3}}$

41652954228.  $2\sqrt{6}$

$$4\sqrt{\frac{5}{3}}$$

41652954229.

Question Number : 88 Question Id : 41652913863 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

The value of

$$\cos^2 10^\circ - \cos 10^\circ \cos 50^\circ + \cos^2 50^\circ$$
 is :

Options :

$$\frac{3}{4} + \cos 20^\circ$$

41652954230.

$$\frac{3}{4}$$

41652954231.

$$\frac{3}{2}(1 + \cos 20^\circ)$$

41652954232.

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

Question Number : 88 Question Id : 41652913863 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$$\cos^2 10^\circ - \cos 10^\circ \cos 50^\circ + \cos^2 50^\circ$$
 का मान है :

Options :

$$\frac{3}{4} + \cos 20^\circ$$

41652954230.

$$\frac{3}{4}$$

41652954231.

$$\frac{3}{2}(1 + \cos 20^\circ)$$

41652954232.

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

41652954233.

Question Number : 89 Question Id : 41652913864 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

$$\text{Let } S = \{\theta \in [-2\pi, 2\pi] : 2\cos^2 \theta + 3\sin \theta = 0\}.$$

Then the sum of the elements of S is :

Options :

$$\frac{13\pi}{6}$$

$$\frac{5\pi}{3}$$

$$\frac{2\pi}{3}$$

$$\frac{\pi}{2}$$

Question Number : 89 Question Id : 41652913864 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

माना

$S = \{\theta \in [-2\pi, 2\pi] : 2 \cos^2 \theta + 3 \sin \theta = 0\}$  है,

तो S के अवयवों का योगफल है :

Options :

$$\frac{13\pi}{6}$$

$$\frac{5\pi}{3}$$

$$\frac{2\pi}{3}$$

$$\frac{\pi}{2}$$

Question Number : 90 Question Id : 41652913865 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

For any two statements p and q, the negation of the expression  $p \vee (\sim p \wedge q)$  is :

Options :

$$\sim p \wedge \sim q$$

$$\sim p \vee \sim q$$

$$p \wedge q$$

$$p \leftrightarrow q$$

Question Number : 90 Question Id : 41652913865 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes  
Single Line Question Option : No Option Orientation : Vertical

Correct Marks : 4 Wrong Marks : 1

किन्हीं दो कथनों p तथा q के लिए, व्यंजक

$p \vee (\sim p \wedge q)$  का निषेधन (negation) है :

Options :

41652954238.  $\sim p \wedge \sim q$

41652954239.  $\sim p \vee \sim q$

41652954240.  $p \wedge q$

41652954241.  $p \leftrightarrow q$