Sl. No	Question No	Previous answer declared	Final Answer declared
2	Q2775266	C	A
15	Q2775346	C	Nullified
23	Q2775097	B	C
41	Q2780524	B	A
43	Q2780880	B	Nullified
56	Q2781104	A	C

Row Labels	Engineering Laterals (Batch 2)
Change of Key	4
Multiple Answer	0
No Change	51
Nullified	2
Grand Total (Unique Questions Claimed)	57

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1) The number of images formed by an object placed between two parallel mirrors is

A) 1

B) 2

C) infinite

D) 4

1) दो समानांतर दर्पणों के बीच रखी किसी वस्तु द्वारा बनने वाले प्रतिबिम्बों की संख्या है

A) 1

B) 2

C) अनंत

D) 4

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775268

Number of Claims: 1

Declared Answer Key: C

Candidate Claim: A

Final Answer: C

Explanation:

if two plane mirrors are inclined to each other at some angle, and an object is placed in front of them, number of images formed = (360/angle) - 1.

in this case, if two mirrors are placed opposite to each other, the angle between them is 0 degrees.

so, number of images formed = (360/0) - 1 = infinity

References:

https://www.lidolearning.com/questions/s-bb-ncert8-ch16-ex-q14/q14-how-many-images-of-a-candl/

Conclusion:

The final answer is option C. There is no change in the answer key

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2) The ratio of velocity of light in water to that in glass if the absolute refractive indices of water and glass are 4/3 and 3/2 is

A) 9/8

B) 1/2

C) 8/9

D) 2/1

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775266

Number of Claims: 17

Declared Answer Key: C

Candidate Claim: A,B,C,D

Final Answer: A

Explanation:

$$\mu = \frac{c}{v}$$

$$\therefore \frac{\text{R.I. of glass}}{\text{R.I. of water}} = \frac{c}{\text{Velocity of light in glass}} \times \frac{\text{Velocity of light in water}}{c}$$

$$\Rightarrow \frac{3/2}{4/3} = \frac{\text{Velocity of light in water}}{\text{Velocity of light in glass}} = \frac{9}{8}$$

References:

https://www.toppr.com/ask/question/if-the-absolute-refractive-indices-of-water-and-glass-are-43-and-32-respectively-then/

Conclusion:

The final answer is option A. There is change from Option C to Option A.

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3) A body of mass m initially at rest explodes into two fragments having masses m/4 and 3m/4 respectively. The lighter fragment is thrown off with a velocity 30(i - j) m/s, where i and j are unit vectors along X-axis and Y-axis respectively. What is the velocity of the heavier fragment?

A) 10(j - i) m/s

B) 10(i - j) m/s

C) 30(j - i) m/s

D) 30(i - j) m/s

3) द्रव्यमान का एक पिंड आरंभिक विरामावस्था से फटकर क्रमशः m/4 और 3m/4 द्रव्यमान वाले दो टुकड़ों में टूट जाता है। हल्का टुकड़ा 30(i - j) m/s के वेग से गिरता है, जहां i और j क्रमशः X-अक्ष और Y-अक्ष के अनुदिश इकाई सदिश हैं। भारी टुकड़े का वेग क्या है?

A) 10(j - i) m/s

B) 10(i - j) m/s

C) 30(j - i) m/s

D) 30(i - j) m/s

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775074

Number of Claims: 6

Declared Answer Key: A

Candidate Claim: A, B, C

Final Answer: A

Explanation:

Given,

A body of mass m initially at rest explodes into two masses,

$m_1 = \dfrac{m}{4}$ and $m_2 = \dfrac{3m}{4}$

velocity of m_1, $v_1 = 30(\hat{i} - \hat{j})$ m/s.

Let the velocity of the heavier mass m_2 be v_2.

then,

initial momentum = 0 ; Final momentum = $m_1 v_1 + m_2 v_2$

from conservation of linear momentum.

$$m_1 v_1 + m_2 v_2 = 0$$

$$\dfrac{m}{4} \times 30(\hat{i} - \hat{j}) + \dfrac{3m}{4} v_2 = 0$$

or, $30(\hat{i} - \hat{j}) = -3 v_2 \Rightarrow \vec{v_2} = 10(\hat{j} - \hat{i})$ m/s.

Ans (A)

Conclusion:

The final answer is option A. There is no change in the answer key

4) A running man has half the kinetic energy that of a running boy of half his mass. When the man speeds up by $1.0\ m/s$, he has as the same kinetic energy as the boy. What is the original speed of the man in m/s ?

A) $\sqrt{2}-1$

B) $\sqrt{2}+2$

C) $\sqrt{2}+1$

D) $\sqrt{2}-2$

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775107

Number of Claims: 1

Declared Answer Key: C

Candidate Claim: None of These

Final Answer: C

Explanation:

(b)　　$\frac{1}{2}mV^2 = \frac{1}{2} \times \frac{1}{2}\frac{m}{2}v^2$

or　　　$V^2 = \frac{v^2}{4}$　or　$V = \frac{v}{2}$ 　　　　　...(i)

Again, $\frac{1}{2}m(V+1)^2 = \frac{1}{2}\frac{m}{2}v^2$

or　　　$(V+1)^2 = \frac{v^2}{2}$

or　　　$V+1 = \frac{v}{\sqrt{2}}$ 　　　　　...(ii)

$(ii) - (i)$ gives　$1 = \frac{v}{\sqrt{2}} - \frac{v}{2}$

　　　　$2\sqrt{2} = 2v - \sqrt{2}v$

or　　　$v = \frac{2\sqrt{2}}{2-\sqrt{2}} \times \frac{2+\sqrt{2}}{2+\sqrt{2}}$　or　$v = \sqrt{2}(2+\sqrt{2})$

or　　　$v = 2\sqrt{2} + 2$

or　　　$v = 2(\sqrt{2}+1)$

Again,　　$V = \frac{v}{2} = \frac{2(\sqrt{2}+1)}{2} = \sqrt{2}+1$

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Let the mass of the man be M and its original speed be v_m
Then, his kinetic energy, $E_m = \frac{1}{2} M v_m^2$

As per the question, mass of the boy, $m = \frac{M}{2}$ moving with a velocity v_b. Then, his kinetic energy,

$$E_b = \frac{1}{2} m v_b^2 \qquad \text{Now,} \quad E_m = \frac{E_b}{2}$$

$$\frac{1}{2} \left(\frac{1}{2} \times \frac{M}{2} \times v_b^2 \right) = \frac{1}{2} \times M \times v_m^2$$

$$\therefore \quad v_b = 2 v_m \quad \text{or,} \quad v_m = v_b/2$$

Now, the new speed of the man, $v_m' = v_m + 1$

$$E_m' = E_b$$

$$\frac{1}{2} M (v_m + 1)^2 = E_b = 2 E_m = 2 \times \frac{1}{2} M v_m^2$$

$$(v_m + 1)^2 = 2 v_m^2$$

$$v_m + 1 = \sqrt{2}\, v_m$$

$$(\sqrt{2} - 1) v_m = 1$$

$$\therefore \quad v_m = \frac{1}{(\sqrt{2} - 1)}\ \text{m/s} = (\sqrt{2} - 1)^{-1}$$

$$\therefore \quad v_m \approx (\sqrt{2} + 1)\ \text{m/s}.$$

References:

H. C. Verma, Concepts of Physics, Vol. 1, Bharti Bhawan Publishers and Distributers (1999).

Refer the link below (Q108):

https://books.google.co.in/books?id=exm1ppJqnkkC&pg=PA167&lpg=PA167&dq=A+running+man+has+half+the+kinetic+energy+that+a+running+boy+of+half+his+mass+has.&source=bl&ots=1TcRZ7tYun&sig=6CgoUbJxL_vGP7ZhrTwa3K_IBKI&hl=en&sa=X&ei=nWZXVevJAseUuQSd64K4Cw&ved=0CDUQ6AEwAw#v=onepage&q=A%20running%20man%20has%20half%20the%20kinetic%20energy%20that%20a%20running%20boy%20of%20half%20his%20mass%20has.&f=false

Conclusion:

The final answer is option C. There is no change in the answer key

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5) Thermodynamic state variables are of two types intensive and extensive. The quantity which best suits for the example of intensive variable is

A) Mass

B) Internal energy

C) Volume

D) Density

5) ऊष्मागतिकीय (थर्मोडायनामिक) अवस्था में चर दो प्रकार के होते हैं सघन (इंटेंसिव) और विस्तीर्ण (एक्सटेंसिव)। वह मात्रा जो सघन चर के उदाहरण के लिए सबसे उपयुक्त है वह है

A) द्रव्यमान

B) आंतरिक ऊर्जा

C) आयतन

D) घनत्व

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775540

Number of Claims: 3

Declared Answer Key: D

Candidate Claim:A,D

Final Answer: D

Explanation:

An intensive variable is one which does not depend on system size (like temperature, pressure, or density). An extensive variable is one which depends on system size (like mass, internal energy or volume).

References:

http://www.ncert.nic.in/NCERTS/l/keph204.pdf

https://books.google.co.in/books?id=KR1CDAAAQBAJ&pg=PA27&dq=intensive+thermodynamic+state+variables+%2B+internal+energy&hl=en&sa=X&ved=0ahUKEwj_yP3zn9rnAhWf6XMBHVB_BvwQ6AEIPzAD#v=onepage&q=intensive%20thermodynamic%20state%20variables%20%2B%20internal%20energy&f=true

http://pillars.che.pitt.edu/student/slide.cgi?course_id=12&slide_id=24.0

https://www.toppr.com/content/concept/thermodynamic-state-variables-and-equation-of-state-210118/

https://www.examfear.com/notes/Class-11/Physics/Thermodynamics/1733/Thermodynamic-state-variables.htm

Conclusion:

The final answer is option D. There is no change in the answer key

6) A sphere, a cube and a thin circular plate all of same material and same mass are initially heated to same high temperature. Then

A) Cube will cool fastest and plate the slowest

B) Plate will cool fastest and cube the slowest

C) Plate will cool fastest and sphere the slowest

D) Sphere will cool fastest and cube the slowest

6) समान सामग्री और समान द्रव्यमान वाला एक गोला, एक घन और एक पतली वृत्ताकार प्लेट, प्रारंभ में समान उच्च तापमान तक गर्म की जाती हैं। ऐसा करने पर

A) घन सबसे तेजी से ठंडा होगा और गोला सबसे धीमे से ठंडा होगा

B) प्लेट सबसे तेजी से ठंडी होगी और घन सबसे धीमे से ठंडा होगा

C) प्लेट सबसे तेजी से ठंडी होगी और गोला सबसे धीमे से ठंडा होगा

D) गोला सबसे तेजी से ठंडा होगा और घन सबसे धीमे से ठंडा होगा

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775601

Number of Claims: 2

Declared Answer Key: C

Candidate Claim: B

Final Answer: C

Explanation:

Since the mass of the sphere, cube and circular plate are same. Also they are made up of the same material. So their density will also be same. Thus, their volume will be same.

For same volume, a thin circular plate will have the maximum surface area, then the cube and finally, the sphere will have the minimum surface area.

Greater the surface area more will be the heat dissipation.

Emissive energy $\propto$ area

Hence, a circular plate will cool the fastest and the sphere will cool the slowest.

Ans (C)

References:

NCERT Physics

Conclusion:

The final answer is option C. There is no change in the answer key

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7) If a charge moves in an electric field, the work done is converted into

A) potential energy

B) current

C) kinetic energy

D) electrostatic energy

7) यदि कोई आवेश विद्युत क्षेत्र में गति करता है, तो किया गया कार्य परिवर्तित हो जाता है

A) स्थितिज ऊर्जा में

B) विद्युत धारा में

C) गतिज ऊर्जा में

D) स्थिरवैद्युत ऊर्जा में

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775341

Number of Claims: 7

Declared Answer Key: C

Candidate Claim: A,B,C

Final Answer: C

Explanation:

Work done in moving a charge in an electric field leads to change in potential energy.

If the charge is moved by an external agent opposite to the direction of electric field, there will be an increase in potential energy.

If the charge is moved due to the force exerted on it by the electric field, then there will be a decrease in potential energy of the system.

References:

https://phys.libretexts.org/Bookshelves/University_Physics/Book%3A_Calculus-Based_Physics_(Schnick)/Volume_B%3A_Electricity_Magnetism_and_Optics/B05%3A_Work_Done_by_the_Electric_Field_and_the_Electric_Potential

Conclusion:

The final answer is option C. There is no change in the answer key

8) Which of the following gases is a primary constituent of both natural gas and biogas?

A) Oxygen

B) Hydrogen

C) Nitrogen

D) Methane

8) निम्नलिखित में से कौन सी गैस प्राकृतिक गैस और बायोगैस दोनों का प्राथमिक घटक है?

A) ऑक्सीजन

B) हाइड्रोजन

C) नाइट्रोजन

D) मीथेन

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775362

Number of Claims: 2

Declared Answer Key: D

Candidate Claim: A,C

Final Answer: D

Explanation:

Biogas is a mixture of methane and carbon dioxide produced by the decomposition of plant and animal waste in the absence of oxygen. It contains methane (45%–65%) and carbon dioxide (30%–40%). It may contain hydrogen, and hydrogen sulphide gases also.
So, the primary constituent in both is methane.

References:

NCERT class X Science Chapter 14: Sources of Energy
http://www.environbusiness.com/eeae/biogas

Conclusion:

The final answer is option D. There is no change in the answer key

9) The device which can focus the image of a distant object on a screen placed on the same side as the object is

A) Concave lens

B) Concave mirror

C) Convex mirror

D) Convex lens

9) वह उपकरण जो किसी दूर की वस्तु के प्रतिबिम्ब को वस्तु के उसी तरफ रखी स्क्रीन पर केंद्रित कर सकता है, कहलाता है

A) अवतल लेंस

B) अवतल दर्पण

C) उत्तल दर्पण

D) उत्तल लेंस

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775265

Number of Claims: 2

Declared Answer Key: B

Candidate Claim:C

Final Answer: B

Explanation:

Concave mirror forms real image of a distant object at the focal point on the same side of the mirror.

References:

NCERT Science For Class X, Chapter – Light – Reflection and Refraction.

http://study.com/academy/lesson/what-is-a-concave-mirror-definition-uses-equation.html.

http://www.meritnation.com/ask-answer/question/a-student-determines-the-focal-length-of-a-device-x-by-focu/determining-focal-lengths-of-concave-mirrors-and-convex-lens/781857

Conclusion:

The final answer is option B. There is no change in the answer key

10) The value of acceleration due to gravity "g" of the earth is

A) g = 9.8 cm s^2

B) g = 9.8 cm/s^2

C) g = 9.8 m/s^2

D) g = 9.8 ms^2

10) पृथ्वी के गुरुत्वाकर्षण "g" के कारण त्वरण का मान है

A) g = 9.8 cm s^2

B) g = 9.8 cm/s^2

C) g = 9.8 m/s^2

D) g = 9.8 ms^2

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775614

Number of Claims: 3

Declared Answer Key: C

Candidate Claim: C,Wrong Framing of Question

Final Answer: C

Explanation:

The question has been framed correctly and candidate should not face any difficulty in arriving at the correct answer. Acceleration due to gravity is the acceleration gained by an object due to the gravitational force. Its SI unit is m/s2. It has both magnitude and direction, hence, it's a vector quantity. Acceleration due to gravity is represented by g. The standard value of g on the surface of the earth at sea level is 9.8 m/s2.

References:

https://physicsteacher.in/2017/10/18/acceleration-due-to-gravity-height-depth/

https://www.physicsclassroom.com/class/circles/Lesson-3/The-Value-of-g

https://byjus.com/jee/acceleration-due-to-gravity/

Conclusion:

The final answer is option C. There is no change in the answer key

11) Relative permittivity of a medium may be expressed in terms of the ratio of

A) forces between charges in vacuum and medium

B) charges in medium and vacuum

C) forces between charges in medium and vacuum

D) charges in vacuum and medium

11) किसी माध्यम की सापेक्ष पारगम्यता को निम्नलिखित में से किसके अनुपात के रूप में व्यक्त किया जा सकता है?

A) निर्वात और माध्यम में आवेशों के बीच बल

B) माध्यम और निर्वात में आवेश

C) माध्यम और निर्वात में आवेशों के बीच बल

D) निर्वात और माध्यम में आवेश

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775342

Number of Claims: 1

Declared Answer Key: A

Candidate Claim:D

Final Answer: A

Explanation:

Relative permeability, ϵ_r of a medium is defined as.

$$\epsilon_r = \frac{\epsilon}{\epsilon_0}$$

Force betn charges in vacuum, $F = \frac{1}{4\pi\epsilon_0} \frac{q_1 q_2}{r^2}$ separated by a distance r

Force betn charges in a medium, $F' = \frac{1}{4\pi\epsilon} \frac{q_1 q_2}{r^2}$ separated by same dist. r

$\therefore \frac{F}{F'} = \frac{1}{4\pi\epsilon_0} \frac{q_1 q_2}{r^2} \times \frac{4\pi\epsilon}{1} \times \frac{r^2}{q_1 q_2} = \frac{\epsilon}{\epsilon_0} = \frac{\epsilon_r \epsilon_0}{\epsilon_0} = \epsilon_r$

$\therefore \epsilon_r$ = ratio of forces betn charges in vacuum and medium.

References:

https://books.google.co.in/books?id=bihuAgAAQBAJ&pg=PA9&lpg=PA9&dq=Can+relative+permittivity+may+be+expressed+as+ratio+of+forces+in++medium+and+vacuum&source=bl&ots=C_ebxIhGrK&sig=ez8-JRSGRRPRQRCluzckbEfHxHY&hl=en&sa=X&ei=IZtTVbqiEoK6uASVuoCoCw&ved=0CC8Q6AEwAw#v=onepage&q=Can%20relative%20permittivity%20may%20be%20expressed%20as%20ratio%20of%20forces%20in%20%20medium%20and%20vacuum&f=false

Conclusion:

The final answer is option A. There is no change in the answer key

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12) The famous Lycurgus cup kept in the British museum looks green in reflected light and red in transmitted light. Which of the following nanoparticles are responsible for the green colour?

A) Iron nanoparticles

B) Gold nanoparticles

C) Silver nanoparticles

D) Carbon nanotubes

12) ब्रिटिश संग्रहालय में रखा प्रसिद्ध लाइकर्गस कप परावर्तित प्रकाश में हरा और पारगमित प्रकाश में लाल दिखता है। निम्नलिखित में से कौन से नैनोकण हरे रंग के लिए जिम्मेदार हैं

A) आयरन नैनोपार्टिकल्स

B) गोल्ड नैनोपार्टिकल्स

C) सिल्वर नैनोपार्टिकल्स

D) कार्बन नैनोट्यूब

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2785842

Number of Claims: 2

Declared Answer Key: C

Candidate Claim:B,C

Final Answer: C

Explanation:

The green colour of the Lycurgus cup is attributed to the light scattering by colloidal dispersions of silver particles with size >40 nm.

References:

M. Loos, Carbon Nanotube Reinforced Composites, ScienceDirect (2015).

https://www.sciencedirect.com/topics/engineering/lycurgus-cup#:~:text=This%20cup%20looks%20green%20in,glass%20which%20scatter%20the%20light.

Conclusion:

The final answer is option C. There is no change in the answer key

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13) Lens which diverges light from a point source is

A) Biconvex Lens

B) Biconcave lens

C) Convex Lens

D) Concave lens

13) वह लेंस जो एक बिंदु स्रोत से प्रकाश का विचलन करता है, कहलाता है

A) उभयोत्तल लेन्स

B) उभयावतल लेन्स

C) उत्तल लेंस

D) अवतल लेंस

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775269

Number of Claims: 1

Declared Answer Key: D

Candidate Claim: B

Final Answer: D

Explanation:

The **parallel ray** goes from the tip of the object horizontally to the lens. It refracts through the lens and diverges away from the principal axis going directly away from the focal point on the object side of the lens.

Concave lens diverges light from a point source.

References:

http://physics.bu.edu/~duffy/semester2/c28_lenses.html

Conclusion:

The final answer is option D. There is no change in the answer key

14) Find the dimensional formula of $[(G^2M^5)/(L^2S)]^{1/3}$, where L, S, G and M represent angular momentum, stress, gravitational constant and mass respectively.

A) $[L^1T^{-1}]$

B) $[T]$

C) $[L]$

D) $[M]$

14) $[(G^2M^5)/(L^2S)]^{1/3}$ का विमीय सूत्र ज्ञात कीजिए, जहां L, S, G और M क्रमशः कोणीय संवेग, प्रतिबल, गुरुत्वीय स्थिरांक और द्रव्यमान को दर्शाते हैं।

A) $[L1T-1]$

B) $[T]$

C) $[L]$

D) $[M]$

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775079

Number of Claims: 6

Declared Answer Key: C

Candidate Claim: A,B,Wrong Framing of Question

Final Answer: C

Explanation:

$$[(G^2M^5)/(L^2S)]^{1/3}$$

L = angular momentum = $r \times p$; $[L] = L \times MLT^{-1} = ML^2T^{-1}$

S = stress, $[S] = \dfrac{[F]}{[A]} = \dfrac{MLT^{-2}}{L^2} = ML^{-1}T^{-2}$

G = Gravitational const.

$F = G\dfrac{m_1m_2}{r^2}$ ∴ $G = \dfrac{Fr^2}{m_1m_2}$

$[G] = \dfrac{MLT^{-2} \times L^2}{M^2} = M^{-1}L^3T^{-2}$

M = mass, $[M] = M$

$[G^2M^5] = (M^{-1}L^3T^{-2})^2(M^5) = M^{-2}L^6T^{-4} \times M^5 = M^3L^6T^{-4}$

$[L^2S] = (ML^2T^{-1})^2 \times (ML^{-1}T^{-2}) = M^2L^4T^{-2} \times ML^{-1}T^{-2}$
$= M^3L^3T^{-4}$

∴ $\left[\dfrac{G^2M^5}{L^2S}\right]^{1/3} = \left[\dfrac{M^3L^6T^{-4}}{M^3L^3T^{-4}}\right]^{1/3} = [L^3]^{1/3} = L$

Ans (C)

References:

H. C. Verma, Concepts of Physics, Vol. 1, Bharti Bhavan Publishers (1999).

Conclusion:

The final answer is option C. There is no change in the answer key

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15) A polythene piece is rubbed with wool is found to have negative charge of 3×10^{-7} C. Find the number electrons transferred (from which to which)?

A) 18.7×10^{12} from polythene to wool

B) 1.87×10^{-12} from wool to polythene

C) 1.87×10^{12} from polythene to wool

D) 18.7×10^{12} from wool to polythene

15) एक पॉलीथिन के टुकड़े को ऊन से रगड़ने पर 3×10^{-7} C का ऋणात्मक आवेश उत्पन्न होता है। स्थानांतरित इलेक्ट्रॉनों की संख्या ज्ञात कीजिए (किस से लेकर किस तक)?

A) 18.7×10^{12} पॉलिथीन से ऊन तक

B) 1.87×10^{-12} ऊन से पॉलीथिन तक

C) 1.87×10^{12} पॉलिथीन से ऊन तक

D) 18.7×10^{12} ऊन से पॉलिथीन तक

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775346

Number of Claims: 16

Declared Answer Key: C

Candidate Claim: A,B,C,D,None of These,Wrong Framing of Question

Final Answer: **None of the options**

Explanation:

$$\text{No. of electrons transferred} = \frac{3 \times 10^{-7}}{1.6 \times 10^{-19}} = 1.87 \times 10^{12}$$

From wool to polythene.

References:

https://books.google.co.in/books?id=bihuAgAAQBAJ&pg=PA215&lpg=PA215&dq=A+polythene+piece+is+rubbed+with+wool+is+found+to+have+negative+charge+of+++++++++++++++3+x+10+-7+C.+Find+the+number+electrons+transferred+(from+which+to+which)?&source=bl&ots=C_faxEmHmP&sig=7FV-zaDRg2bsqzQX4Kw4nuideCo&hl=en&sa=X&ved=0CB0Q6AEwAGoVChMIspaOhqXExwIVTpGOCh0TSAtj#v=onepage&q=A%20polythene%20piece%20is%20rubbed%20with%20wool%20is%20found%20to%20have%20negative%20charge%20of%20%20%20%20%20%20%20%20%20%20%20%20%20%20%20%203%20x%2010%20-7%20C.%20Find%20the%20number%20electrons%20transferred%20(from%20which%20to%20which)%3F&f=false

https://www.toppr.com/ask/question/a-polythene-piece-rubbed-with-wool-is-found-to-have-a-negative-charge-of-3times-2/

Conclusion:

As none of the options are correct, the question is Nullified.

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16) The thermodynamic quantity which is a measure of the total heat content of the system is

A) Internal Energy

B) Free Energy

C) Enthalpy

D) Entropy

16) वह थर्मोडायनामिक मात्रा क्या है जो सिस्टम की कुल अंतर्निहित ऊष्मा का एक माप है?

A) आंतरिक ऊर्जा

B) मुक्त ऊर्जा

C) एन्थैल्पी

D) एन्ट्रॉपी

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775549

Number of Claims: 1

Declared Answer Key: C

Candidate Claim:D

Final Answer: C

Explanation:

Enthalpy is a measure of **total heat content** of the system

The thermodynamic quantity which is a measure of the total heat content of the system is known as Enthalpy

Entropy, the measure of a system's thermal energy per unit temperature that is unavailable for doing useful work.

Free energy is that portion of any first-law energy that is available to perform thermodynamic work at constant temperature, i.e., work mediated by thermal energy.

In thermodynamics, the internal energy of a system is the energy contained within the system.

References:

https://www.thermal-engineering.org/what-is-enthalpy-definition/

https://www.nuclear-power.net/nuclear-engineering/thermodynamics/what-is-energy-physics/what-is-enthalpy/

http://www1.lsbu.ac.uk/water/thermodynamics.html

https://brainly.in/question/1311824

http://tutors4you.com/thermodynamicsenthalpy.htm

Conclusion:

The final answer is option C. There is no change in the answer key

17) What is an Example of non renewable Source of Energy?

A) Wind

B) Natural gas

C) Bio power

D) Solar energy

17) ऊर्जा के गैर-नवीकरणीय स्रोत का उदाहरण क्या है?

A) हवा

B) प्राकृतिक गैस

C) जैव शक्ति

D) सौर ऊर्जा

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775398

Number of Claims: 4

Declared Answer Key: B

Candidate Claim:A,D

Final Answer: B

Explanation:

A renewable resource can replenish itself at the rate it is used, while a non-renewable resource has a limited supply. Renewable resources include wind, biogas, biofuels, Tidal energy, Geothermal energy, Nuclear energy and solar while non-renewable resources include coal, petroleum and natural gas. Biogas, also known as renewable natural gas, It is "renewable" in the sense that humans and animals will keep producing waste

References:

Renewable and Non-Renewable Energy Sources, https://gkscientist.com/renewable-and-non-renewable-energy-sources/

https://books.google.co.in/books?id=I_FjAgAAQBAJ&printsec=frontcover&dq=which+of+the+following+is+an+example+of+a+renewable+source+of+energy&hl=en&sa=X&ved=0ahUKEwj_5ornyvHnAhVNwjgGHfLN DX8Q6AEIKDAA#v=onepage&q=which%20of%20the%20following%20is%20an%20example%20of%20a%20renewable%20source%20of%20energy&f=false

Conclusion:

The final answer is option B. There is no change in the answer key

18) In SI system, which of the following is NOT a fundamental or base physical quantity?

A) Luminous Intensity

B) Electric current

C) Amount of substance

D) Plane angle

18) SI प्रणाली में, निम्नलिखित में से कौन मौलिक या आधार भौतिक मात्रा नहीं है?

A) ज्योति तीव्रता

B) विद्युत प्रवाह

C) पदार्थ की मात्रा

D) समतल कोण

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775073

Number of Claims: 8

Declared Answer Key: D

Candidate Claim: A

Final Answer: D

Explanation:

Angle is the ratio of two lengths namely arc length to the radius making it a dimensionless quantity. Angle is not a basic quantity because it is defined by another basic quantity i.e. length. Derived quantities all have dimensions which is not the case for angles. Thus, They are called supplementary quantities.

References:

http://ncert.nic.in/NCERTS/l/keph102.pdf

Conclusion:

The final answer is option D. There is no change in the answer key

19) Among the following physical quantities, the only one that has an SI unit but is dimensionless is

A) Reynolds number

B) Solid angle

C) Amount of substance

D) Luminous Intensity

19) निम्नलिखित भौतिक मात्राओं में से वह भौतिक मात्रा कौन सी है जिसकी एसआई इकाई तो है लेकिन वह आयामहीन है?

A) रेनॉल्ड्स नंबर

B) सॉलिड एंगल

C) पदार्थ की मात्रा

D) दीप्त तीव्रता (लुमिनस इंटेंसिटी)

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775072

Number of Claims: 12

Declared Answer Key: B

Candidate Claim: A,B,D,None of These,Wrong Framing of Question

Final Answer: B

Explanation:

The question has been framed correctly and candidate should not face any difficulty in arriving at the correct answer.

Reynolds number has no unit and no dimension. Amount of substance AND Luminous Intensity have both unit and dimension. Solid angle has SI unit steradian and is dimensionless
The solid angle is defined as the area on the unit sphere subtended by the angle divided by one unit area. It's a ratio so it's a single dimensionless number.

References:

https://books.google.co.in/books?id=dvwR7XtAwr0C&pg=PA25&dq=dimensional+formula+of+Force+and+weight+is+same&hl=en&sa=X&ved=0ahUKEwiCiZbuqMTnAhWKzDgGHfSMC6gQ6AEIKDAA#v=onepage&q=%22of%20the%20following%20are%20dimensionless%22&f=false

https://physics.stackexchange.com/questions/98863/whats-the-dimensionality-of-a-solid-angle

Conclusion:

The final answer is option B. There is no change in the answer key

20) A body of mass 'm' starting from rest is acted on by a force producing a velocity $v = \sqrt{k \times s}$ where k is a constant and s is displacement. The work done by the force in the first 't' seconds is

A) $m^2 k^2 t^2 / 8$

B) $mk^2 t^2 / 4$

C) $mk^2 t^2 / 8$

D) $m^2 k^2 t$

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775105

Number of Claims: 3

Declared Answer Key: C

Candidate Claim: A,D,None of These

Final Answer: C

Explanation:

$v = \sqrt{k \times s}$

$\dfrac{ds}{dt} = \sqrt{k \times s}$

on integration we get

$s = \dfrac{kt^2}{4}$

differentiating with respect to t

$v = \dfrac{kt}{2}$

differentiating with respect to t

$a = \dfrac{k}{2}$

$W = Fs = \dfrac{mk^2 t^2}{8}$

References:

H. C. Verma, Concepts of Physics, Vol. 1, Bharti Bhawan Publishers and Distributers (1999).

Conclusion:

The final answer is option C. There is no change in the answer key

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21) Among the following pairs of physical quantities, the only pair which does NOT have the same dimensional formula is

A) Linear momentum and Planck's constant

B) Force and weight

C) Entropy and Boltzmann constant

D) Momentum and impulse

21) भौतिक मात्राओं के निम्नलिखित युग्मों में एकमात्र ऐसा युग्म है जिसका विमीय सूत्र समान नहीं है

A) रैखिक गति और प्लैंक का स्थिरांक

B) बल और वजन

C) एन्ट्रॉपी और बोल्ट्जमैन स्थिरांक

D) गति और आवेग

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775071

Number of Claims: 49

Declared Answer Key: A

Candidate Claim: A,B,C,D,None of These

Final Answer: A

Explanation:

A. Linear Momentum and Planck's Constant.

Linear momentum, $[P] = [mv] = MLT^{-1}$

Planck's const. $[h] = [J.s] = ML^2T^{-2} \times T = ML^2T^{-1}$ } NOT Same.

B. Force and weight.

Force, $[F] = MLT^{-2}$

Weight, $[W] = [mg] = M \times LT^{-2} = MLT^{-2}$ } — Same.

C. Entropy and Boltzmann Const.

Entropy, $[S] = \left[\frac{\Delta Q}{T}\right] = ML^2T^{-2}K^{-1}$

Boltzmann Const., $[k] = [J/K] = ML^2T^{-2}K^{-1}$ } — Same.

D. Momentum and impulse.

(assuming this momentum to be linear momentum).

Momentum, $[P] = [mv] = MLT^{-1}$

Impulse, $[F\Delta t] = MLT^{-2} \times T = MLT^{-1}$ } — Same.

Ans (A)

References:

Resnick, Hallidey and Walker, Fundamentals of Physics, Extended. 10th Edition, Wiley (2014).

https://books.google.co.in/books?id=dvwR7XtAwr0C&pg=PA25&dq=dimensional+formula+of+Force+and+weight+is+same&hl=en&sa=X&ved=0ahUKEwiCiZbuqMTnAhWKzDgGHfSMC6gQ6AEIKDAA#v=onepage&q=%22quantities%20have%20the%20same%20dimensional%20formula%22&f=false

Conclusion:

The final answer is option A. There is no change in the answer key

22) Which of the following nanomaterials are used in the treatment of breast cancer cells?

A) Graphene sheets

B) Gold coated nanoparticles

C) Carbon nanorods

D) Fe nanoparticles

22) स्तन कैंसर की कोशिकाओं के उपचार में निम्नलिखित में से किस नैनोमैटेरियल का उपयोग किया जाता है?

A) ग्राफीन शीट

B) गोल्ड कोटेड नैनोपार्टिकल्स

C) कार्बन नैनोरोड्स

D) Fe नैनोपार्टिकल्स

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2785857

Number of Claims: 1

Declared Answer Key: B

Candidate Claim:C

Final Answer: B

Explanation:

Gold coated nanoparticles are used in Cancer therapy.
Among the provided options, Gold nanoparticles are used in localized Cancer therapy. To treat breast cancer cells with gold-coated nanoparticles, for example, antibodies are attached to the gold nanoshells, which latch onto the targeted cancer cells. In gold nanoshell treatments with mice, scientists achieved a 100 percent effectiveness rate in killing breast cancer cells, compared to the untreated mice, which all died within 30 days.

References:

L. Williams, Dr. W. Adams, Nanotechnology Demystified, McGraw Hill (2007), Page 98, 00, 110.
Anshu B. Mathur, Nanotechnology in Cancer, Elsevier (2017).

Conclusion:

The final answer is option B. There is no change in the answer key

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23) A cyclist comes to a skidding stop in $10\,m$. During this process, the force on the bicycle due to the road is $200\,N$ and is directly opposed to the motion. The work done by the cycle on the road is

A) $-200\,J$

B) $2000\,J$

C) Zero

D) $+200\,J$

23) एक साइकिलिस्ट 10 मीटर में स्किडिंग स्टॉप पर आता है। इस प्रक्रिया के दौरान, सड़क के कारण साइकिल पर लगने वाला बल 200N है और यह गति के सीधे विपरीत है। सड़क पर साइकिल द्वारा किया गया कार्य है

A) $-200\,J$

B) $2000\,J$

C) शून्य

D) $+200\,J$

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775097

Number of Claims: 5

Declared Answer Key: B

Candidate Claim: A,B,C,D

Final Answer:C

Explanation:

Newton's law of motion suggests that if the cyclist exert a force on the road, the road will also exert a force on the cyclist. The reaction force will do work only if it displaces. In this case, the road remains in its position and doesn't move at all. Rather the point of application of force by the cyclist on the road changes. Hence, the work done must be 0.

References:

https://www.doubtnut.com/question-answer-physics/a-bicyclist-comes-to-a-skidding-stop-in-10m-during-this-process-the-force-on-the-bicycle-dur-to-the--11764587

Conclusion:

The final answer is option C. There is change from B to C.

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24) Statement 1: A photon has a zero rest mass.

Statement 2: It is impossible to slow down a photon.

A) Both the statements are correct but statement 2 is not the inference of statement 1.

B) Statement 1 is true but statement 2 is false.

C) Statement 1 is false but statement 2 is true.

D) Both the statements are correct and statement 2 is the inference drawn from statement 1.

24) कथन 1: फोटान का शून्य विरामस्थ द्रव्यमान होता है।

कथन 2: फोटॉन को धीमा करना असंभव है।

A) दोनों कथन सही हैं लेकिन कथन 2 कथन 1 का निष्कर्ष नहीं है

B) कथन 1 सत्य है लेकिन कथन 2 असत्य है

C) कथन 1 असत्य है लेकिन कथन 2 सत्य है

D) दोनों कथन सही हैं और कथन 2 कथन 1 से लिया गया निष्कर्ष है

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2785831

Number of Claims: 2

Declared Answer Key: D

Candidate Claim:C

Final Answer: D

Explanation:

A photon has zero rest mass. Due to which the energy and momentum expressions are valid only if photon is always moving with a speed equal to speed of light.

Thus, it is impossible to slow down a photon

References:

Arthur Beiser, Concepts of Modern Physics, 5th Edition, Tata McGraw Hill (1997), Chapter 1, page No. 30.

Conclusion:

The final answer is option D. There is no change in the answer key

25) A body of mass 0.5 kg travels in a straight line with velocity $v = ax^{3/2}$ where $a = 5m^{-1/2}s^{-1}$. The work done by the net force during its displacement from x = 0 to x = 2m is

A) 100 J

B) 1.5 J

C) 50 J

D) 10 J

25) 0.5 kg द्रव्यमान का एक पिंड $v = ax^{3/2}$ वेग के साथ एक सीधी रेखा में यात्रा करता है जहां $5m^{-1/2}s^{-1}$ है। x = 0 से x = 2m तक विस्थापन के दौरान शुद्ध बल द्वारा किया गया कार्य है

A) 100 J

B) 1.5 J

C) 50 J

D) 10 J

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2775096

Number of Claims: 1

Declared Answer Key: C

Candidate Claim: A

Final Answer: C

Explanation:

Given,

mass of the body = m = 0.5 kg

velocity, $v = ax^{3/2}$.

acceleration, $a' = \dfrac{dv}{dt} = \dfrac{dv}{dx} \cdot \dfrac{dx}{dt} = v\dfrac{dv}{dx}$

$\therefore a' = (ax^{3/2})\dfrac{d}{dx}(ax^{3/2}) = a^2x^{3/2} \cdot \dfrac{3}{2}x^{1/2} = \dfrac{3}{2}a^2x^2$

Force acting on the body = $F = ma' = \dfrac{1}{2} \times \dfrac{3}{2}a^2x^2 = \dfrac{3}{4}a^2x^2$.

Work done in displacing the body from x=0 to x=2m.

$W = \int_0^2 F \cdot dx = \int_0^2 \dfrac{3}{4}a^2x^2 dx = \dfrac{3}{4}a^2\left[\dfrac{x^3}{3}\right]_0^2 = \dfrac{3}{4}a^2 \times \dfrac{8}{3}$

$W = 2a^2$

Given, $a = 5m^{-1/2}s^{-1}$ $\therefore W = 2 \times 5^2 , 50J$. Ans (C)

References:

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Conclusion:

The final answer is option C. There is no change in the answer key

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26) The name of water in IUPAC system is

A) Hydrogen monoxide

B) Oxidane

C) Water

D) Hydrogen hydroxide

26) IUPAC पद्धति में पानी को क्या नाम दिया गया है?

A) हाइड्रोजन मोनोऑक्साइड

B) ऑक्सीडेन

C) पानी

D) हाइड्रोजन हाइड्रॉक्साइड

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2786599

Number of Claims: 1

Declared Answer Key: B

Candidate Claim: B

Final Answer: B

Explanation:

The framing of the question and the answer options is appropriate to arrive at the correct answer. Since, there is no discrepancy found between the claimed answer option and the declared answer key, there is no change in the answer key.

Conclusion:

The final answer is option B. There is no change in the answer key.

27) Most abundant element in earth's crust by weight is

A) iron

B) aluminium

C) silicon

D) oxygen

27) भार के आधार पर भू पर्पटी में सर्वाधिक मात्रा में पाया जाने वाला तत्व है

A) लोहा (आयरन)

B) एल्यूमीनियम

C) सिलिकॉन

D) ऑक्सीजन

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2786615

Number of Claims: 1

Declared Answer Key: D

Candidate Claim: B

Final Answer: D

Explanation:

Oxygen is the most abundant of all elements. It exists in the free form as dioxygen molecule and makes up 20.9% by volume and 23% by weight of the atmosphere. Oxygen makes up 46.6% by weight of earth crust, where it is the major constituent of silicate minerals. Silicon is the second most abundant element by weight in earth's crust. Aluminium is the third most abundant element (after oxygen and silicon) by weight in earth's crust.

The snapshot below can be referred to.

Oxygen is the most abundant of all elements. It exists in the free form as dioxygen molecules O_2 and makes up 20.9% by volume and 23% by weight of the atmosphere. Most of this has been produced by photosynthesis, the process where the chlorophyll in the green parts of plants uses the sun's energy to make foodstuffs such as glucose sugar.

$$6CO_2 + 6H_2O + \text{energy from the sun} \rightarrow C_6H_{12}O_6 + 6O_2$$
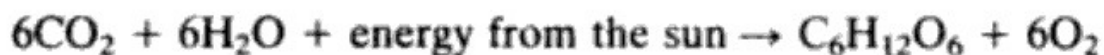
Oxygen makes up 46.6% by weight of the earth's crust, where it is the major constituent of silicate minerals. Oxygen also occurs as many metal oxide ores, and as deposits of oxosalts such as carbonates, sulphates, nitrates and borates. Oceans cover three quarters of the earth's surface, and oxygen makes up 89% by weight of the water in the oceans. Ozone O_3 exists in the upper atmosphere, and is of great importance. This is discussed later.

References:

1. Concise Inorganic Chemistry by J.D.Lee 5th Edn., ELBS,1996, P-534

2. Chemistry of the elements, by N.N. Greenwood and A. Earnshaw, 2nd Edn, Butterworth-Heineman, p-600.

3. Inorganic Chemistry: Chemical Elements an their Compound by R.L. Dutta, 6th Edn, The New Book Stall, 2010, p- 186

Conclusion:

The final answer is option D. There is no change in the answer key.

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28) Ozone layer protecting earth's surface from harmful UV rays is present in which layer of atmosphere?

A) Troposphere

B) Stratosphere

C) Ionosphere

D) Exosphere

28) हानिकारक UV किरणों से पृथ्वी की सतह की रक्षा करने वाली ओज़ोन परत वायुमंडल की किस परत में मौजूद है?

A) क्षोभ मंडल

B) समताप मंडल

C) आयन मंडल

D) बाह्य मंडल

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2785536

Number of Claims: 1

Declared Answer Key: B

Candidate Claim: B

Final Answer: B

Explanation:

The framing of the question and the answer options is appropriate to arrive at the correct answer. Since, there is no discrepancy found between the claimed answer option and the declared answer key, there is no change in the answer key.

Conclusion:

The final answer is option B. There is no change in the answer key.

29) Four metals A, B, C and D have SRP values of $-2.76\,V, -1.66\,V, -0.76\,V$ and $+0.80\,V$ respectively, the most reducing metal among these is

A) B

B) D

C) C

D) A

29) चार धातुओं A,B,C और D में क्रमशः - 2.76V, -1.66 V, - 0.76V और + 0.80 V के SRP मूल्य हैं, इनमें से सबसे अपचायक धातु है

A) B

B) D

C) C

D) A

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2780867

Number of Claims: 1

Declared Answer Key: D

Candidate Claim:D

Final Answer: D

Explanation:

The framing of the question and the answer options is appropriate to arrive at the correct answer. Since, there is no discrepancy found between the claimed answer option and the declared answer key, there is no change in the answer key.

Conclusion:

The final answer is option D. There is no change in the answer key.

30) Galvanization is deposition of

A) Aluminium oin iron

B) Zinc on iron

C) Copper on iron

D) Tin on iron

30) गैल्वनीकरण का निक्षेपण क्या है?

A) लोहे पर एल्युमिनियम

B) लोहे पर जिंक

C) लोहे पर तांबा

D) लोहे पर टिन

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2786648

Number of Claims: 1

Declared Answer Key: B

Candidate Claim: B

Final Answer: B

Explanation:

The framing of the question and the answer options is appropriate to arrive at the correct answer. Since, there is no discrepancy found between the claimed answer option and the declared answer key, there is no change in the answer key.

Conclusion:

The final answer is option B. There is no change in the answer key.

31) Which one of the following cutting fluids is used while machining cast iron?

A) Soluble oil

B) Water

C) Dry air

D) Mineral oil

31) कच्चे लोहे की मशीनिंग के दौरान किस कटिंग द्रव का उपयोग किया जाता है?

A) घुलनशील तेल

B) जल

C) शुष्क वायु

D) खनिज तेल

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2786530

Number of Claims: 2

Declared Answer Key: C

Candidate Claim: B, D

Final Answer: C

Explanation:

Cast iron contains a larger percentage of carbon in the form of graphite that acts as a lubricant for its cutting. The snapshot below can be referred to.

Gray cast iron. Gray iron is the most widely used of cast metals. In this iron, the carbon is in the form of graphite flakes that form a multitude of notches and discontinuities in the iron matrix. The appearance of the fracture of this iron is gray because the graphite flakes are exposed. The strength of the iron increases as the graphite-crystal size decreases and the amount of cementite increases. Gray cast iron is easily machinable because the graphite carbon acts as a lubricant for the cutting tool and also provides discontinuities which break the chips as they are cast. Gray iron, having a wide range of tensile strength, from 20,000–30,000 to 90,000 psi, can be made by alloying with nickel, chromium, molybdenum, vanadium, and copper.

References:

https://testbook.com/question-answer/while-machining-cast-iron-the-coolant-used-should--6049b359aad553b68d2e1bf9

https://www.google.co.in/books/edition/Boiler_Operator_S_Gd_4E/DaXRlmM74kIC?hl=en&gbpv=1&dq=Cast++iron+contains+a+larger+percentage+of+carbon+in+the+form+of+graphite+that+acts+as+a+lubricant+for+its+cutting.&pg=PA197&printsec=frontcover

https://mytutorialworld.com/objective-
questions/single_question_view.php?table_name=fitter_set_2_sheet_metal&uid=1&title=Which%20cutting%
20fluid%20used%20for%20drilling%20in%20cast%20iron?

https://www.google.co.in/books/edition/Tech_Of_Machine_Tools_Sie/WGTNPz4NEzQC?hl=en&gbpv=1&dq
=Cast+iron+Dry+Air+jet+Dry+air&pg=PA269&printsec=frontcover

https://www.google.co.in/books/edition/Technology_of_Machine_Tools/A-
E3AwAAQBAJ?hl=en&gbpv=1&dq=Cast+iron+Dry+Air+jet+Dry+air&pg=PA271&printsec=frontcover

Conclusion:

The final answer is option C. There is no change in the answer key.

32) In nature most of the metals are found in

A) form of alloys

B) both oxidised and reduced form

C) oxidised form

D) reduced form

32) प्रकृति में अधिकांश धातुएँ किस रूप में पाई जाती हैं?

A) मिश्र धातुओं के रूप में

B) ऑक्सीकृत और अपचयित दोनों रूपों में

C) ऑक्सीकृत रूप में

D) अपचयित रूप में

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2786618

Number of Claims: 1

Declared Answer Key: C

Candidate Claim: C

Final Answer: C

Explanation:

The framing of the question and the answer options is appropriate to arrive at the correct answer. Since, there is no discrepancy found between the claimed answer option and the declared answer key, there is no change in the answer key.

Conclusion:

The final answer is option C. There is no change in the answer key.

33) Best quality steel is manufactured by

A) Electrical process

B) Crucible process

C) Bassemer's process

D) Simenes Martin's process

33) उत्तम गुणवत्ता वाले स्टील का निर्माण किसके द्वारा किया जाता है?

A) विद्युत प्रक्रिया

B) क्रूसिबल प्रक्रिया

C) बेसेमर प्रक्रिया

D) सीमेंस मार्टिन प्रक्रिया

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2786649

Number of Claims: 1

Declared Answer Key: A
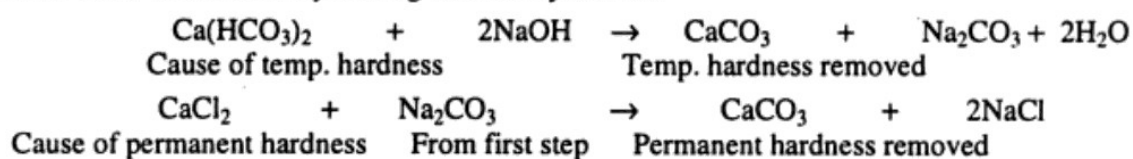
Candidate Claim: A

Final Answer: A

Explanation:

The framing of the question and the answer options is appropriate to arrive at the correct answer. Since, there is no discrepancy found between the claimed answer option and the declared answer key, there is no change in the answer key.

Conclusion:

The final answer is option A. There is no change in the answer key.

34) Permanent hardness can be removed by adding

A) Sodium bicarbonate

B) Sodium carbonate

C) Bleaching powder

D) Chlorine water

34) स्थायी कठोरता को क्या मिलाकर दूर किया जा सकता है?

A) सोडियम बाइकार्बोनेट

B) सोडियम कार्बोनेट

C) ब्लीचिंग पाउडर

D) क्लोरीन वॉटर

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2786603

Number of Claims: 1

Declared Answer Key: B

Candidate Claim: C

Final Answer: B

Explanation:

Permanent hardness can be removed by precipitating $CaCO_3$ and $MgCO_3$.

$CaCl_2 + Na_2CO_3 = CaCO_3 + 2NaCl$.
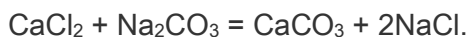
By washing soda method: In this method, water is treated with a calculated amount of washing soda (Na_2CO_3) which convert the chlorides and sulphate of calcium and magnesium into their respective carbonates which get precipitated.

The snapshot below can be referred to.

It is also likely that both temporary as well as permanent hardness may be present together. In such cases, water is softened by adding sodium hydroxide.

$$Ca(HCO_3)_2 + 2NaOH \rightarrow CaCO_3 + Na_2CO_3 + 2H_2O$$
Cause of temp. hardness   Temp. hardness removed

$$CaCl_2 + Na_2CO_3 \rightarrow CaCO_3 + 2NaCl$$
Cause of permanent hardness   From first step   Permanent hardness removed

References:

Modern ABC Chemistry Class XI, Part-II, by S.P. Jauhar, Modern Publisher, p- 9/20

General and Inorganic Chemistry by P.K. Dutt, Sarat Book House, 8th Edn, 1986, p-345

https://www.google.co.in/books/edition/Pow_Plant_Engg/votk3eNryHMC?hl=en&gbpv=1&dq=CaCl2+%2B+Na2CO3+%3D+CaCO3+%2B+2NaCl.&pg=PA405&printsec=frontcover

https://www.google.co.in/books/edition/Industrial_Chemistry/Q6XFfg8IIuAC?hl=en&gbpv=1&dq=CaCl2+%2B+Na2CO3+%3D+CaCO3+%2B+2NaCl.&pg=SA10-PA41&printsec=frontcover

Conclusion: The final answer is option B.There is no change in the answer key.

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35) If the spin of both the two electrons in (2px)2 electrons in an electronic configuration are +1/2, then

A) it violates Hund's rule only; not Aufbau principle and Pauli's exclusion principle

B) it violates Aufbau's principle only; not Hund's rule and Pauli's exclusion principle

C) it violates Pauli's exclusion principle only; not aufbau principle and Hund's rule

D) it violates Hund's rule, Aufbau principle and Pauli's exclusion principle

35) यदि एक इलेक्ट्रॉनिक विन्यास में, (2px)2 इलेक्ट्रॉनों में दोनों इलेक्ट्रॉनों का स्पिन +1/2 हैं, तो

A) यह केवल हुंड के नियम का उल्लंघन करता है; आफबाऊ सिद्धांत और पाउली के अपवर्जन सिद्धांत का नहीं

B) यह केवल आफबाऊ के सिद्धांत का उल्लंघन करता है; हुंड के नियम और पाउली के अपवर्जन सिद्धांत का नहीं

C) यह केवल पाउली के अपवर्जन सिद्धांत का उल्लंघन करता है; आफबाऊ सिद्धांत और हुंड के नियम का नहीं

D) यह हुंड के नियम, आफबाऊ सिद्धांत और पाउली के अपवर्जन सिद्धांत का उल्लंघन करता है

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2780533

Number of Claims: 1

Declared Answer Key: C

Candidate Claim: B

Final Answer: C

Explanation:

Pauli principle state no two electron can have all the four quantum numbers same. So the quest violates Paulis principle, with both electron having the same spin. The filling of electron is in order. Hence, there is no violation in Hunds rule and Aufbau p

The correct option is C.

As two electrons is in the same orbital with same spin, so it violets the Pauli Exclusion Principle because in this configuration all the four quantum numbers will be the same (n = 2, l = 1, m= either -1 or +1, s= +1/2 for both electron). Hund's Rule is not violated because either placing the one electron each in the different 2p-subshell or both in the same 2p subshell with +1/2 spin, the spin multiplicity will be 3 (whatever may the stability). Aufbau Principle is not violated because the filling of electron is in the same energy level.

References:

General and Inorganic Chemistry (Part-I) by R. Sarkar, 3rd Edn., 2011, New Central Book Agency.

https://books.google.co.in/books?id=w44FWAJZg8QC&pg=PA170&lpg=PA170&dq=If+the+spin+of+both+the+two+electrons+in+(2px)2+electrons+in+an+electronic+configuration+are+%2B1/2,+then&source=bl&ots=l1DqyH2JbW&sig=ACfU3U0vwXmfsgZ-5YqhTdzlv_Aomnyimw&hl=en&sa=X&ved=2ahUKEwiyy6OtzqjzAhX14jgGHbOhD6gQ6AF6BAgOEAM#v=onepage&q=If%20the%20spin%20of%20both%20the%20two%20electrons%20in%20(2px)2%20electrons%20in%20an%20electronic%20configuration%20are%20%2B1%2F2%2C%20then&f=true

Conclusion:

The final answer is option C.There is no change in the answer key.

36) Steel is heated to below red heat and then cooled slowly. The process refers to

A) Hardening

B) Tempering

C) Annealing

D) Nitriding

36) स्टील को लाल ताप से नीचे तक गर्म किया जाता है और फिर धीरे-धीरे ठंडा किया जाता है। यह किस प्रक्रिया को संदर्भित करता है?

A) हार्डनिंग

B) टेम्परिंग

C) एनीलिंग

D) नाइट्राइडिंग

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2786647

Number of Claims: 1

Declared Answer Key: C

Candidate Claim: D

Final Answer: C

Explanation:

Hardening: This involves heating steel to a temperature below red heat and then cooling it rapidly by plunging in oil or water. This is called quenching of steel. ms makes steel very hard but brittle.

Tempering: If quenched steel is reheated to a pre-determined temperature lower than before and kept at it for pre-determined time, the mechanical properties become changed to a particular extent. This steel is called tempered steel. Due to this, hardened steel becomes softer and loses its brittleness. Tempered steel is used in making razor blades, knife, cutlery, sword, springs of watches etc.

Annealing: If steel is heated below red heat and then cooled slowly, the process is called annealing. The steel so obtained is mild, soft but tensile.

Nitriding: This is modern process of case hardening. It involves heating of alloy steels in an atmosphere of ammonia gas at 500 - 600 °C. Nitrogen formed by decomposition of ammonia combines with iron to make iron nitride which is a very hard substance. This makes the steel

surface very hard and resistant to corrosion.

The snapshot below can be referred to.

Sol. (b) The process of heating the steel to a temperature much below to redness and cooling it slowly, is called annealing.

References:

Inorganic Chemistry (Question & Answer) by R.L. Madan & G.D. Tuli, S.Chand Publication, 2007, p-179

Dinesh Objective Chemistry (Vol. III) by P.N. Kapil et. al. S. Dinesh & Co., 2010, p-I-507

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Conclusion:

The final answer is option C.There is no change in the answer key.

37) Mischmetal contains

A) Fe + Cr + Mn ss

B) Fe + Mn + Co

C) Fe + C + Al

D) Fe + Ce

37) मिश्रमेटल में

A) Fe + Cr + Mn होता है

B) Fe + Mn + Co होता है

C) Fe + C + Al होता है

D) Fe + Ce होता है

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2786650

Number of Claims: 3

Declared Answer Key: D

Candidate Claim: A

Final Answer: D

Explanation:

Mischmetal contains Fe = 30% and Ce = 70%

The snapshot below can be referred to.

FULL ARTICLE

Misch metal, alloy consisting of about 50 percent cerium, 25 percent lanthanum, 15 percent neodymium, and 10 percent other rare-earth metals and iron. Misch metal has been produced on a relatively large scale since the early 1900s as the primary commercial form of mixed rare-earth metals. Misch metal alloyed with iron is the flint (spark-producing agent) in cigarette lighters and similar devices. Misch metal is also used as a deoxidizer in various alloys and to remove oxygen in vacuum tubes. As an alloying agent in magnesium, it contributes to high strength and creep resistance.

Key People: Carl Auer, Freiherr von Welsbach

References:

Concise Inorganic Chemistry, by J.D. Lee, 5th Edn., 2011, Wiley India, p-863

General and Inorganic Chemistry by P.K. Dutt, Sarat Book House, 8th Edn, 1986, p-454

Conclusion: The final answer is option D. There is no change in the answer key.

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38) Which of the following is a type of paint coating failure related to aging?

A) Wrinkling

B) Blushing

C) Undercutting

D) Cratering

38) निम्नलिखित में से कौन उम्र बढ़ने से संबंधित पेंट कोटिंग बिफलता का एक प्रकार है?

A) सिकुड़न

B) ब्लशन

C) अंडरकटिंग

D) क्रेटरिंग

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2786520

Number of Claims: 1

Declared Answer Key: C

Candidate Claim: C

Final Answer: C

Explanation:

The framing of the question and the answer options is appropriate to arrive at the correct answer. Since, there is no discrepancy found between the claimed answer option and the declared answer key, there is no change in the answer key.

Conclusion:

The final answer is option C. There is no change in the answer key.

39) In which year, Water Pollution and Prevention Act was enacted by Government of India to regulate and prevent pollution?

A) 1986

B) 1974

C) 1970

D) 1981

39) भारत सरकार द्वारा किस वर्ष प्रदूषण को नियंत्रित करने और रोकने के लिए जल प्रदूषण और रोकथाम अधिनियम को अधिनियमित किया गया था?

A) 1986

B) 1974

C) 1970

D) 1981

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2785535

Number of Claims: 1

Declared Answer Key: B

Candidate Claim:D

Final Answer: B

Explanation:

Water Pollution and Prevention Act was enacted in 1974 by Government of India to regulate and prevent pollution. This Act may be called the Water (Prevention and Control of Pollution) Act, 1974. It applies in the first instance to the whole of the States of Assam, Bihar, Gujarat, Haryana, Himachal Pradesh, Jammu and Kashmir, Karnataka, Kerala, Madhya Pradesh, Rajasthan, Tripura and West Bengal and the Union territories.

The snapshot below can be referred to.

Water Pollution   Updated On : 25 Sep 2019

The Water (Prevention and Control of Pollution) Act was enacted in 1974 to provide for the prevention and control of water pollution, and for the maintaining or restoring of wholesomeness of water in the country. The Act was amended in 1988. The Water (Prevention and Control of Pollution) Cess Act was enacted in 1977, to provide for the levy and collection of a cess on water consumed by persons operating and carrying on certain types of industrial activities. This cess is collected with a view to augment the resources of the Central Board and the State Boards for the prevention and control of water pollution constituted under the Water (Prevention and Control of Pollution) Act, 1974. The Act was last amended in 2003.

References:

General science standard Eight published by Maharashtra state
http://moef.nic.in/division/water-pollution
Environmental Science, by S.C. Santra, 2nd Edn., 2008, New Central Book Agency (P) Ltd. p-904.

https://cpcb.nic.in/water-pollution/

https://hspcb.gov.in/Water%20Act,%201974%20Relevant%20provisions.pdf

Conclusion:

The final answer is option B. There is no change in the answer key.

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40) The standard reduction electrode potentials of copper and magnesium electrodes are + 0.34 and $-2.34\ V$ respectively. The emf of the cell is

A) $-2.0\ V$

B) $7.0\ V$

C) $+2.68\ V$

D) $-2.68\ V$

40) कॉपर और मैग्नीशियम इलेक्ट्रोड के मानक रिडक्शन इलेक्ट्रोड विभव क्रमशः + 0.34 और - 2.34 V हैं। सेल का ईएमएफ है

A) $-2.0\ V$

B) $7.0\ V$

C) $+2.68\ V$

D) $-2.68\ V$

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2780866

Number of Claims: 1

Declared Answer Key: C

Candidate Claim:A

Final Answer: C

Explanation:

According to the question, we can see the Mg has the lower SRP than Cu, hence Mg acts as anode and Cu acts as Cathode. Hence, the emf of the cell (ECell) = Ecathode – Eanode = ECu0 – EMg0 = 0.34 – (-2.34) = +2.68 V. Hence the correct option is C.

References:

Selected Topics in Inorganic Chemistry, W.U. Malik, G.D. Tuli, R.D. Madan, 2013, S. Chand & Company Pvt. Ltd. p-677.

https://www.google.co.in/books/edition/Nature_Of_Chemistry_Volume_3/r3AtEAAAQBAJ?hl=en&gbpv=1&dq=standard+reduction+electrode+potentials+of+copper+and+magnesium+electrodes+are+%2B+0.34+and&pg=PA200&printsec=frontcover

Conclusion:

The final answer is option C. There is no change in the answer key.

41) Which one among the following combinations is CORRECT about shape of orbital?

A) s-spherical; p-dumbbell; d-double bumb bell and doughnut; f-diffused

B) s-disc; p-dumbbell; d-double bumb bell and doughnut; f-diffused

C) s-doughnut; p-dumbbell; d-double bumb bell and doughnut; f-disc

D) s-spherical; p-dumbbell; d-double bumb bell; f-disc

41) निम्नलिखित संयोजनों में से कौन-सा, कक्षीय आकार के बारे में सही है?

A) s-गोलाकार; p-डंबेल; d-डबल बम्ब बेल और डोनट; f-विसरित

B) s-डिस्क; p-डंबेल; d-डबल बम्ब बेल और डोनट; f-विसरित

C) s-डोनट; p-डंबेल; d-डबल बम्ब बेल और डोनट; f-डिस्क

D) s-गोलाकार; p-डंबेल; d-डबल बम्ब बेल; f-डिस्क

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2780524

Number of Claims: 23

Declared Answer Key: B

Candidate Claim: A,B,C,D

Final Answer: A

Explanation:

s-is spherical, neither doughnut nor disc, so 2 & 3 are wrong. F -is diffused not disc shaped. The correct answer is Option A.

s-spherical; p-dumbbell; d-double bumb bell and doughnut; f-diffused

References:

1. Concise Inorganic Chemistry, by J.D. Lee, 5th Edn., 2011, Wiley India, p-13

2. Fundamental Concepts of Inorganic Chemistry (vol. 1), by A.K. Das, 2nd End., 2012, CBS Publishers & Distributors Pvt. Ltd. p-207

https://www.vedantu.com/question-answer/shape-of-the-forbital-a-spherical-b-dumb-class-11-chemistry-cbse-5f7ea4c066f6e04fe0cd4001

Conclusion:

The final answer is option A. There is change from option B to A.

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42) The solution with highest conductivity is :

A) 1 mole of KCl in 500 cm³ of the solution

B) 1 mole of KCl in 100 cm³ of the solution

C) 1 mole of KCl in 250 cm³ of the solution

D) 1 mole of KCl in 1000 cm³ of the solution

42) उच्चतम चालकता वाला विलयन है :

A) विलयन के 500 cm³ में KCl का 1 मोल

B) विलयन के 100 cm³ में KCl का 1 मोल

C) विलयन के 250 cm³ में KCl का 1 मोल

D) विलयन के 1000 cm³ में KCl का 1 मोल

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2780892

Number of Claims: 8

Declared Answer Key: D

Candidate Claim: A, B, C, None of These

Final Answer: D

Explanation:

As the electrolyte (KCl) is strong, hence the conductivity of electrolyte solution depends on the concentration of the solution. The conductivity of KCl increases with increasing dilution. So, the correct option is D which is the most dilute solution among those solutions.

References:

A Text Book of Physical Chemistry by A.S. Negi and S.C. Anand, 1st Edn., 2001, New Age International (P) Ltd. Publishers, p-504.

https://www.zigya.com/study/book?class=12&board=cbse&subject=chemistry&book=chemistry+i&chapter=electrochemistry&q_type=&q_topic=&q_category=&question_id=CHEN12045924

http://rajpalmalra.blog.com/?page_id=69

http://www.finishing.com/100/10.shtml

Conclusion:

The final answer is option D. There is no change in the answer key.

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43) The amount of coulombs of electricity required to oxidise 1 mole of hydrogen peroxide to oxygen is :

A) 2 C

B) 386000C

C) 48250C

D) 96500C

43) हाइड्रोजन पेरोक्साइड के 1 मोल को ऑक्सीजन में ऑक्सीकृत करने के लिए आवश्यक विद्युत कूलॉम की मात्रा है:

A) 2 C

B) 386000C

C) 48250C

D) 96500C

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2780880

Number of Claims: 1

Declared Answer Key: B

Candidate Claim: C

Final Answer: None of these

Explanation:

Oxidation of 1 mole of H_2O_2 will require 2 moles of electrons. Hence, the amount of coulombs of electricity required = 2 x 96500 C = 193000 C = 1.93×10^5 C
So, the correct option is not given.

The snapshot below can be referred to.

156. $H_2O_2 \longrightarrow H_2O + \dfrac{1}{2}O_2$

i.e. $\quad 2H^+ + 2e^- \longrightarrow H_2O$

Thus 1 mole of H_2O_2 requires

$\quad 2\,F = 2 \times 96500\,C = 1.93 \times 10^5\,C$
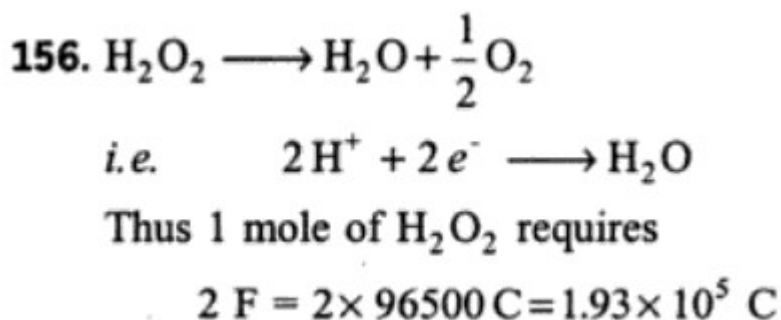
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https://books.google.co.in/books?id=eW1aJ2FG7G4C&pg=RA10-PA22&lpg=RA10-PA22&dq=amount+of+coulombs+of+electricity+required+to+oxidise+1+mole+of+hydrogen++peroxide+to+oxygen&source=bl&ots=FiCwgxhqZp&sig=ACfU3U3FZe0L1IZK6raRP1yYybrFgdnCIA&hl=en&sa=X&ved=2ahUKEwjWmOu68qjzAhUi7XMBHcU5DIAQ6AF6BAggEAM#v=onepage&q=amount%20of%20coulombs%20of%20electricity%20required%20to%20oxidise%201%20mole%20of%20hydrogen%20%20peroxide%20to%20oxygen&f=false

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Conclusion:

As none of the options are correct, the question is nullified.

44) Which act was enacted in 1981 by Government of India to regulate and prevent pollution?

A) Environmental Protection Act

B) Environmental Pollution and Prevention Act

C) Water Pollution and Prevention Act

D) The Air (Prevention and Control of Pollution) Act,

44) भारत सरकार ने 1981 में प्रदूषण को नियंत्रित करने और रोकने के लिए कौन-सा अधिनियम अधिनियमित किया था?

A) पर्यावरण संरक्षण अधिनियम

B) पर्यावरण प्रदूषण और रोकथाम अधिनियम

C) जल प्रदूषण और रोकथाम अधिनियम

D) वायु (रोकथाम और प्रदूषण नियंत्रण) अधिनियम

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	2785534

Number of Claims: 1

Declared Answer Key: D

Candidate Claim:D

Final Answer: D

Explanation:

The framing of the question and the answer options is appropriate to arrive at the correct answer. Since, there is no discrepancy found between the claimed answer option and the declared answer key, there is no change in the answer key.

Conclusion:

The final answer is option D. There is no change in the answer key.

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45) In the Arithmetic Progression 1, 2, 3, 4, …….. , the sum upto 10 terms is

A) 505

B) 5050

C) 50

D) 55

45) समांतर श्रेणी 1, 2, 3, 4, …….. में, 10 पदों तक का योग है

A) 505

B) 5050

C) 50

D) 55

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2781154

Number of Claims: 1

Declared Answer Key: D

Candidate Claim: A

Final Answer: D

Explanation:

Sum of n natural numbers = $\frac{n(n+1)}{2} = \frac{10(10+1)}{2} = 55$

Conclusion:

The final answer is option D. There is no change in the answer key.

46) If A is a 3x3 matrix, then |3A| =

A) $|A|^3$

B) 27|A|

C) 3|A|

D) 9|A|

46) यदि A 3 X 3 मैट्रिक्स है, तो | 3A | =

A) $|A|^3$

B) 27|A|

C) 3|A|

D) 9|A|

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2781132

Number of Claims: 1

Declared Answer Key: B

Candidate Claim: B

Final Answer: B

Explanation:

The framing of the question and the answer options is appropriate to arrive at the correct answer. Since, there is no discrepancy found between the claimed answer option and the declared answer key, there is no change in the answer key.

$$19) \quad |3A| = 3^3 |A| = 27 |A|$$

Ans (3)   code A2

Conclusion: The final answer is option B. There is no change in the answer key.

47) Number of partial fractions in the resolving of $\dfrac{2x+11}{x^2-7x+10}$

A) 2

B) 1

C) 4

D) 3

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2786422

Number of Claims: 1

Declared Answer Key: A

Candidate Claim:D

Final Answer: A

Explanation:

Reviewer Reference: NCERT Class 12 Mathematics

$\dfrac{2x+11}{x^2-7x+10}$

$= \dfrac{7}{x-5} - \dfrac{5}{x-2}$

Hence: 2 terms

Conclusion:

The final answer is option A. There is no change in the answer key.

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48) $y = \tanh^{-1}\left(\tan\dfrac{x}{2}\right)$ then $\dfrac{dy}{dx}$ is

A) $\dfrac{1}{2}$

B) $\sec x$

C) $\dfrac{\sec^2\dfrac{x}{2}}{1-\tan^2\dfrac{x}{2}}$

D) $\dfrac{\sec^2\dfrac{x}{2}}{2\left(1-\tan^2\dfrac{x}{2}\right)}$

48) $y = \tanh^{-1}\left(\tan\dfrac{x}{2}\right)$ तो $\dfrac{dy}{dx}$ है

A) $\dfrac{1}{2}$

B) $\sec x$

C) $\dfrac{\sec^2\dfrac{x}{2}}{1-\tan^2\dfrac{x}{2}}$

D) $\dfrac{\sec^2\dfrac{x}{2}}{2\left(1-\tan^2\dfrac{x}{2}\right)}$

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2781113

Number of Claims: 7

Declared Answer Key: D

Candidate Claim: A,B,C,Wrong Framing of Question

Final Answer: D

Explanation:

The question has been framed correctly and candidate should not face any difficulty in arriving at the correct answer.

Conclusion:

The final answer is option D. There is no change in the answer key.

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49)

The derivative of $\tan^{-1}\left(\dfrac{2x\sqrt{1-x^2}}{1-2x^2}\right)$ w.r.t $\sec^{-1}\left(\dfrac{1}{2x^2-1}\right)$ at $x=\dfrac{1}{2}$ is

A) -1

B) 2

C) -2

D) 1

49) $x=\dfrac{1}{2}$ पर $\sec^{-1}\left(\dfrac{1}{2x^2-1}\right)$ के संबंध में $\tan^{-1}\left(\dfrac{2x\sqrt{1-x^2}}{1-2x^2}\right)$ का व्युत्पन्न है

A) -1

B) 2

C) -2

D) 1

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2781120

Number of Claims: 1

Declared Answer Key: A

Candidate Claim: D

Final Answer: A

Explanation:

Conclusion:

The final answer is option A. There is no change in the answer key.

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50) If the vertices of a triangle are (1, k), (4, -3), (-9, 7) and its area is 15 sq units, find the value of k?

A) 5

B) -4

C) 2

D) -3

50) यदि किसी त्रिभुज के शीर्ष (1, k), (4, -3), (-9, 7) हैं और उसका क्षेत्रफल 15 वर्ग इकाई है, तो k का मान ज्ञात कीजिए।

A) 5

B) -4

C) 2

D) -3

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2780945

Number of Claims: 1

Declared Answer Key: D

Candidate Claim: Wrong Framing of Question

Final Answer: D

Explanation:

The vértices of the triangle are A(1, k)   , B(4, -3) and   C(-9, 7)

Area of △ ABC = $\frac{1}{2}$ [x1 (y2– y3) + x2 (y3 – y1) + x3 (y1 – y2)]

= $\frac{1}{2}$ [1(–3 –7) + 4(7 – k) + (– 9) (k +3)] = 15

$\Rightarrow$ – 10 + 28 – 4k – 9k – 27 = 30

$\Rightarrow$ – 9 – 13k = 30

$\Rightarrow$ k = –3

Conclusion:

The question has been framed correctly and candidate should not face any difficulty in arriving at the correct answer.

The final answer is option D. There is no change in the answer key.

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51) Volume is a

A) Scalar quantity

B) Derived quantity

C) Vector quantity

D) Base quantity

51) वॉल्यूम है

A) अदिश मात्रा

B) व्युत्पन्न मात्रा

C) वेक्टर क्वांटिटी

D) आधार मात्रा

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2781081

Number of Claims: 9

Declared Answer Key: A

Candidate Claim: A, C, D, Wrong Framing of Question

Final Answer: A

Explanation:

Volume is a scalar Quantity

Conclusion:

The question has been framed correctly and candidate should not face any difficulty in arriving at the correct answer.

The final answer is option A. There is no change in the answer key.

52) Maximum value of the function

$41 + 24x - 18x^2$

A) 49

B) 42

C) 45

D) 40

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2786438

Number of Claims: 1

Declared Answer Key: A

Candidate Claim: B

Final Answer: A

Explanation:

Differenciating the expression and equating to 0, we get:

24 - 36x = 0

=> x= 2/3

Maximum value = 41+ 16 - 8 = 49

Conclusion:

The final answer is option A. There is no change in the answer key.

53) If $\tan^{-1}\left(\dfrac{y}{x}\right)-\dfrac{1}{2}\log(x^2+y^2)=0$ then $\dfrac{dy}{dx}$ is

A) $\dfrac{x-y}{x+y}$

B) $\dfrac{x+y}{x-y}$

C) $(x+y)(x-y)$

D) 1

53) यदि $\tan^{-1}\left(\dfrac{y}{x}\right)-\dfrac{1}{2}\log(x^2+y^2)=0$ तो $\dfrac{dy}{dx}$ है

A) $\dfrac{x-y}{x+y}$

B) $\dfrac{x+y}{x-y}$

C) $(x+y)(x-y)$

D) 1

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2781110

Number of Claims: 1

Declared Answer Key: B

Candidate Claim: B

Final Answer: B

Explanation:

The framing of the question and the answer options is appropriate to arrive at the correct answer. Since, there is no discrepancy found between the claimed answer option and the declared answer key, there is no change in the answer key.

Conclusion: The final answer is option B. There is no change in the answer key.

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54) Differentiate sin(sin2x)

A) 2cos2x.sin2x

B) cos2x.cos(sin2x)

C) 2cos2x.cos2x

D) 2cos2x.cos(sin2x)

54) sin(sin2x) का अंतर क्या है

A) 2cos2x.sin2x

B) cos2x.cos(sin2x)

C) 2cos2x.cos2x

D) 2cos2x.cos(sin2x)

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2781103

Number of Claims: 1

Declared Answer Key: D

Candidate Claim:D

Final Answer: D

Explanation:

$Let\ y$=sin(sin(2x)) $\Rightarrow$ dy/dx = d/dx sin(sin(2x)) = cos(sin2x) . d/dx sin(2x) = cos(sin2x) . cos(2x) d/dx (2x) = 2cos2x . cos (sin2x)

The framing of the question and the answer options is appropriate to arrive at the correct answer. Since, there is no discrepancy found between the claimed answer option and the declared answer key, there is no change in the answer key.

Conclusion: The final answer is option D. There is no change in the answer key.

55) The multiplicative inverse of the matrix A =
$$\begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$$ is

A) $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

B) $\begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$

C) $\begin{bmatrix} 0 & 1 & -1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{bmatrix}$

D) $\begin{bmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$

55) आव्यूह (मैट्रिक्स) A = $\begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$ का गुणन प्रतिलोम है

A) $\begin{bmatrix} 0 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

B) $\begin{bmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{bmatrix}$

C) $\begin{bmatrix} 0 & 1 & -1 \\ 0 & -1 & 0 \\ -1 & 0 & 0 \end{bmatrix}$

D) $\begin{bmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2780897

Number of Claims: 1

Declared Answer Key: B

Candidate Claim: B

Final Answer: B

Explanation:

The framing of the question and the answer options is appropriate to arrive at the correct answer. Since, there is no discrepancy found between the claimed answer option and the declared answer key, there is no change in the answer key.

Conclusion:

The final answer is option B. There is no change in the answer key.

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56) Find the derivative of √2x + 2√x - 1/√x?

A) √2+1/√x(1-1/2x)

B) √2-1/√x(1-1/2x)

C) √2+1/√x(1+1/2x)

D) √2-1/√x(1+1/2x)

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2781104

Number of Claims: 18

Declared Answer Key: A

Candidate Claim: A, B, C, D

Final Answer: C

Explanation:

Let y= √2x + 2√x - 1/√x
then, dy/dx = √2 + 2. (1/2).(1/√x) − 1.(−1/2).(1/(x√x)) =
√2 + 1/√x + 1/(2x√x) = √2 + 1/√x (1+1/2x)

Conclusion:

The final answer is option C. There is change from option A to C.

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57) If l = $3\vec{i} - \vec{j} + 2\vec{k}$, m = $\vec{i} + \vec{j} + 2\vec{k}$ and n = $2\vec{i} + 2\vec{j} + 2\vec{k}$ are three vectors, then what is the value of λ such that n is perpendicular to λl + m ?

A) 1

B) 2

C) -1

D) -2

57)यदि l = $\vec{i} - \vec{j} + 2\vec{k}$, m = $\vec{i} + \vec{j} + 2\vec{k}$ और n = $2\vec{i} + 2\vec{j} + 2\vec{k}$ तीन सदिश हों, तो λ का मान क्या होगा कि n λl + m के लंबवत हो?

A) 1

B) 2

C) -1

D) -2

Domain Name	Batch	Question No
Engineering Laterals	Batch 2	Q2780969

Number of Claims: 2

Declared Answer Key: C

Candidate Claim: A, C

Final Answer: C

Explanation:

Justification: Given λl + m implies

$\lambda(3\vec{i} - \vec{j} + 2\vec{k}) + \vec{i} + \vec{j} + 2\vec{k}$

$= (3\lambda+1)\vec{i} - (\lambda-1)\vec{j} + (2\lambda+2)\vec{k}$

Given n is perpendicular to λl + m => n.(λl + m)=0

$(2\vec{i} + 2\vec{j} + 2\vec{k}) . [(3\lambda+1)\vec{i} - (\lambda-1)\vec{j} + (2\lambda+2)\vec{k}] = 0$

$2(3\lambda+1) - 2(\lambda-1) + 2(2\lambda+2) = 0$

$6\lambda + 2 - 2\lambda + 2 + 4\lambda + 4 = 0$

$8\lambda + 8 = 0$

$8\lambda = -8$

$\lambda = -1$

Conclusion:

The final answer is option C. There is no change in the answer key.

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