

National Testing Agency

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B TECH EU

Group Number :	1
Group Id :	708191187
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Break time :	0
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Physics Section A

Section Id :	708191700
Section Number :	1
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20

Section Marks : 80
Mark As Answered Required? : Yes
Sub-Section Number : 1
Sub-Section Id : 708191980
Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 70819117404 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

The period of oscillation of a simple pendulum is $T = 2\pi\sqrt{\frac{L}{g}}$. Measured value of 'L' is 1.0 m from meter scale having a minimum division of 1 mm and time of one complete oscillation is 1.95 s measured from stopwatch of 0.01 s resolution. The percentage error in the determination of 'g' will be :

Options :

70819157361. 1.33 %

70819157362. 1.03 %

70819157363. 1.13 %

70819157364. 1.30 %

Question Number : 1 Question Id : 70819117404 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

سادہ پنڈولم کے دور کی مساوات $T = 2\pi \sqrt{\frac{L}{g}}$ ہے۔ پنڈولم کی لمبائی $L = 1.0 \text{ m}$ پیمائش کی گئی۔ پیمائش کے لیے استعمال میٹر پٹی پر سب سے چھوٹا نشان 1 mm ہے۔ اور پنڈولم کا دور کی پیمائش 1.95 s کی گئی۔ پیمائش کے لیے استعمال گھڑی کی اقل پیمائش 0.01 s ہے۔ بتائیے اس پنڈولم کی مدد سے 'g' کی قدر معلوم کرنے پر اس میں پیدا فیصد نقص کتنا ہوگا ؟

Options :

70819157361. 1.33%

70819157362. 1.03%

70819157363. 1.13%

70819157364. 1.30%

Question Number : 2 Question Id : 70819117405 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A particle is projected with velocity v_0 along x -axis. A damping force is acting on the particle which is proportional to the square of the distance from the origin i.e. $ma = -\alpha x^2$. The distance at which the particle stops :

Options :

70819157365. $\left(\frac{2v_0^2}{3\alpha}\right)^{\frac{1}{2}}$

70819157366. $\left(\frac{3v_0^2}{2\alpha}\right)^{\frac{1}{2}}$

70819157367. $\left(\frac{3v_0^2}{2\alpha}\right)^{\frac{1}{3}}$

70819157368. $\left(\frac{2v_0}{3\alpha}\right)^{\frac{1}{3}}$

Question Number : 2 Question Id : 70819117405 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

ایک ذرہ کو x محور کی سمت میں رفتار v_0 کے ساتھ داغا گیا۔ اس پر عمل کرنے والی ست قوت، مہدے سے فاصلے کے مربع کے تناسب میں ہوتی ہے۔ اور وہ $ma = -\alpha x^2$ ہے۔ بتائیے کہ وہ ذرہ کہاں پر حالت سکون میں آئے گا۔

Options :

70819157365. $\left(\frac{2v_0^2}{3\alpha}\right)^{\frac{1}{2}}$

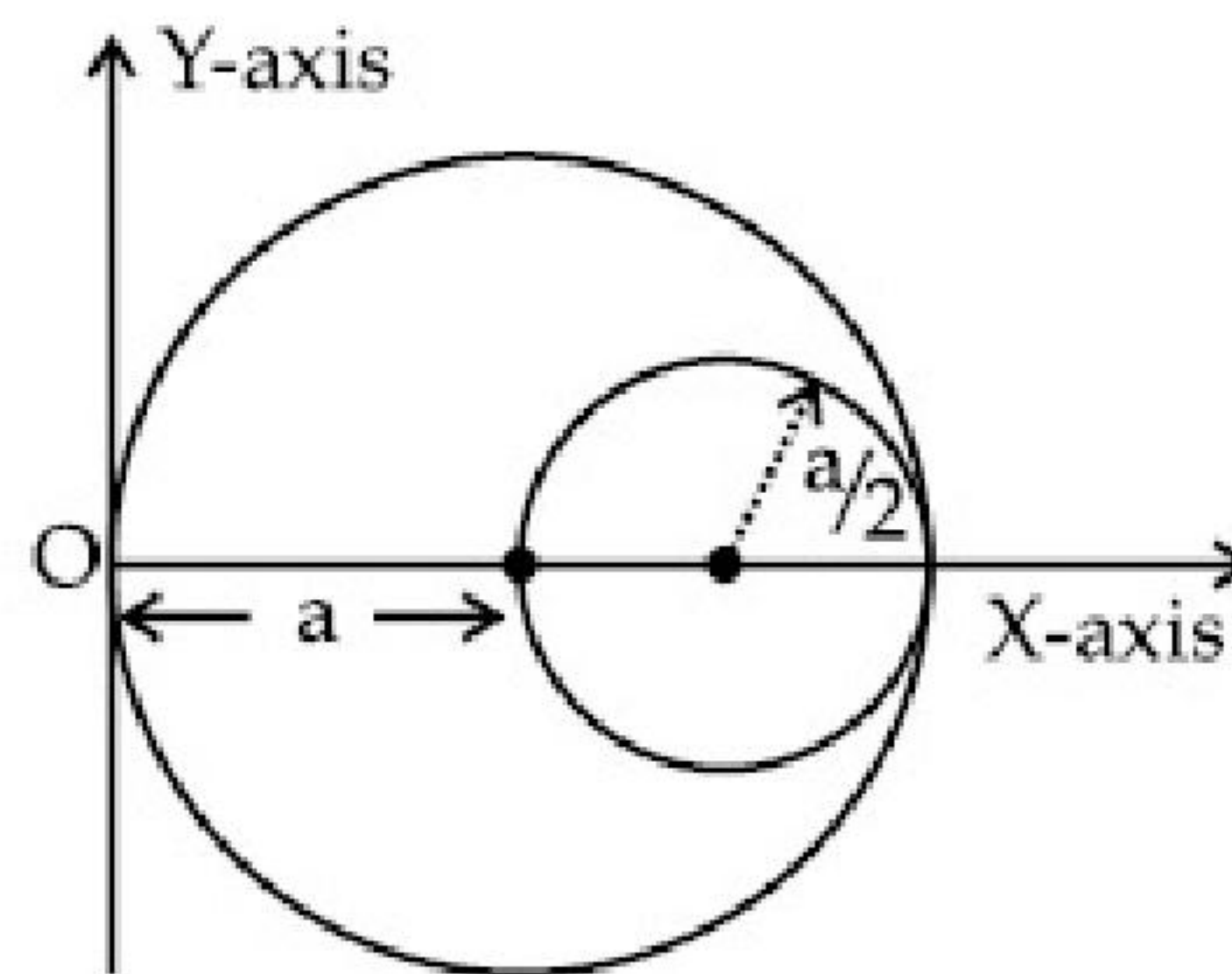
70819157366. $\left(\frac{3v_0^2}{2\alpha}\right)^{\frac{1}{2}}$

70819157367. $\left(\frac{3v_0^2}{2\alpha}\right)^{\frac{1}{3}}$

70819157368. $\left(\frac{2v_0}{3\alpha}\right)^{\frac{1}{3}}$

Question Number : 3 Question Id : 70819117406 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

A circular hole of radius $\left(\frac{a}{2}\right)$ is cut out of a circular disc of radius 'a' as shown in figure. The centroid of the remaining circular portion with respect to point 'O' will be :



Options :

70819157369. $\frac{1}{6}a$

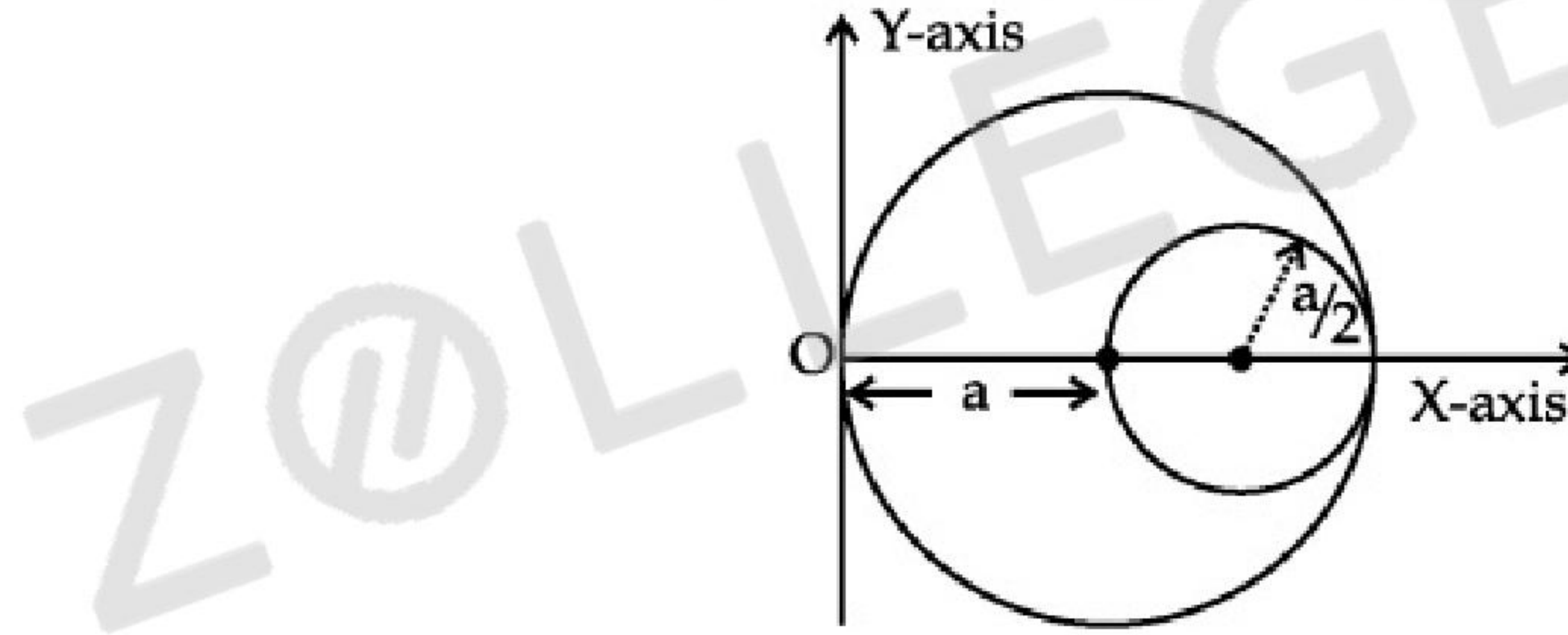
70819157370. $\frac{5}{6}a$

70819157371. $\frac{2}{3}a$

70819157372. $\frac{10}{11}a$

Question Number : 3 Question Id : 70819117406 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

نصف قطر 'a' رکھنے والے دائروں میں سے نصف قطر $\left(\frac{a}{2}\right)$ کا ایک حصہ کاٹ کر نکالا گیا جیسا کہ شکل میں دکھایا گیا ہے۔ بتائیے اب حاصل
دائروں حلقہ کا نقطہ 'O' کی مناسبت سے کیت کا مرکز :



Options :

70819157369. $\frac{1}{6}a$

70819157370. $\frac{5}{6}a$

70819157371. $\frac{2}{3}a$

70819157372. $\frac{10}{11}a$

Question Number : 4 Question Id : 70819117407 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

A body weighs 49 N on a spring balance at the north pole. What will be its weight recorded on the same weighing machine, if it is shifted to the equator ?

[Use $g = \frac{GM}{R^2} = 9.8 \text{ ms}^{-2}$ and radius of earth, $R = 6400 \text{ km}$.]

Options :

70819157373. 49.17 N

70819157374. 49 N

70819157375. 48.83 N

70819157376. 49.83 N

Question Number : 4 Question Id : 70819117407 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

ایک شے کے شمالی قطب پر اسپرنگ ترازو سے وزن 49 N ہے۔ اگر اس شے کو استوا پر منتقل کریں تب اسی اسپرنگ ترازو سے وزن کیا ہوگا ؟
(جہاں $g = \frac{GM}{R^2} = 9.8 \text{ ms}^{-2}$ ؛ اور زمین کا نصف قطر $R = 6400 \text{ km}$)

Options :

70819157373. 49.17 N

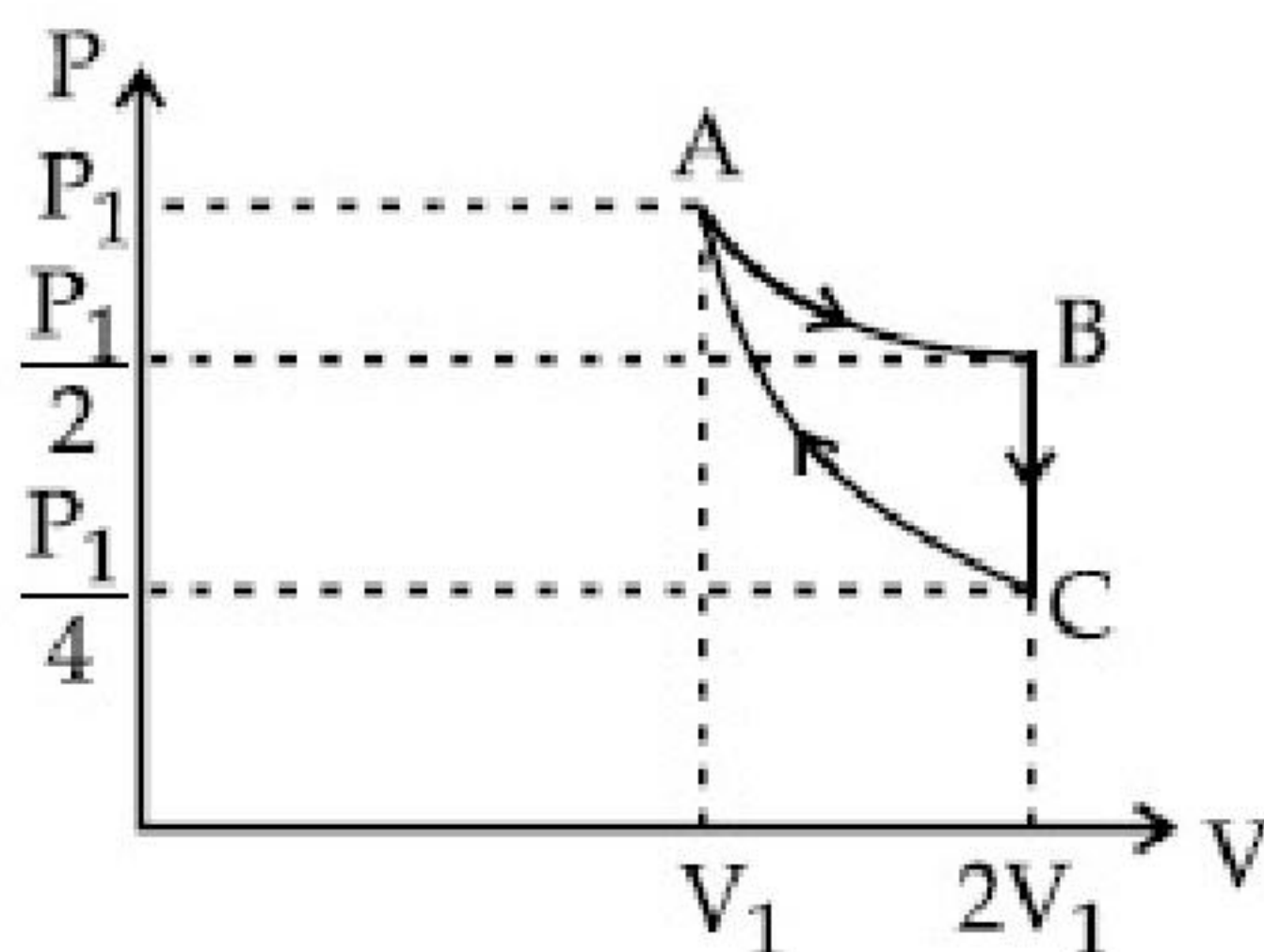
70819157374. 49 N

70819157375. 48.83 N

70819157376. 49.83 N

Question Number : 5 Question Id : 70819117408 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

If one mole of an ideal gas at (P_1, V_1) is allowed to expand reversibly and isothermally (A to B) its pressure is reduced to one-half of the original pressure (see figure). This is followed by a constant volume cooling till its pressure is reduced to one-fourth of the initial value ($B \rightarrow C$). Then it is restored to its initial state by a reversible adiabatic compression (C to A). The net workdone by the gas is equal to :



Options :

70819157377. $RT \left(\ln 2 - \frac{1}{2(\gamma-1)} \right)$

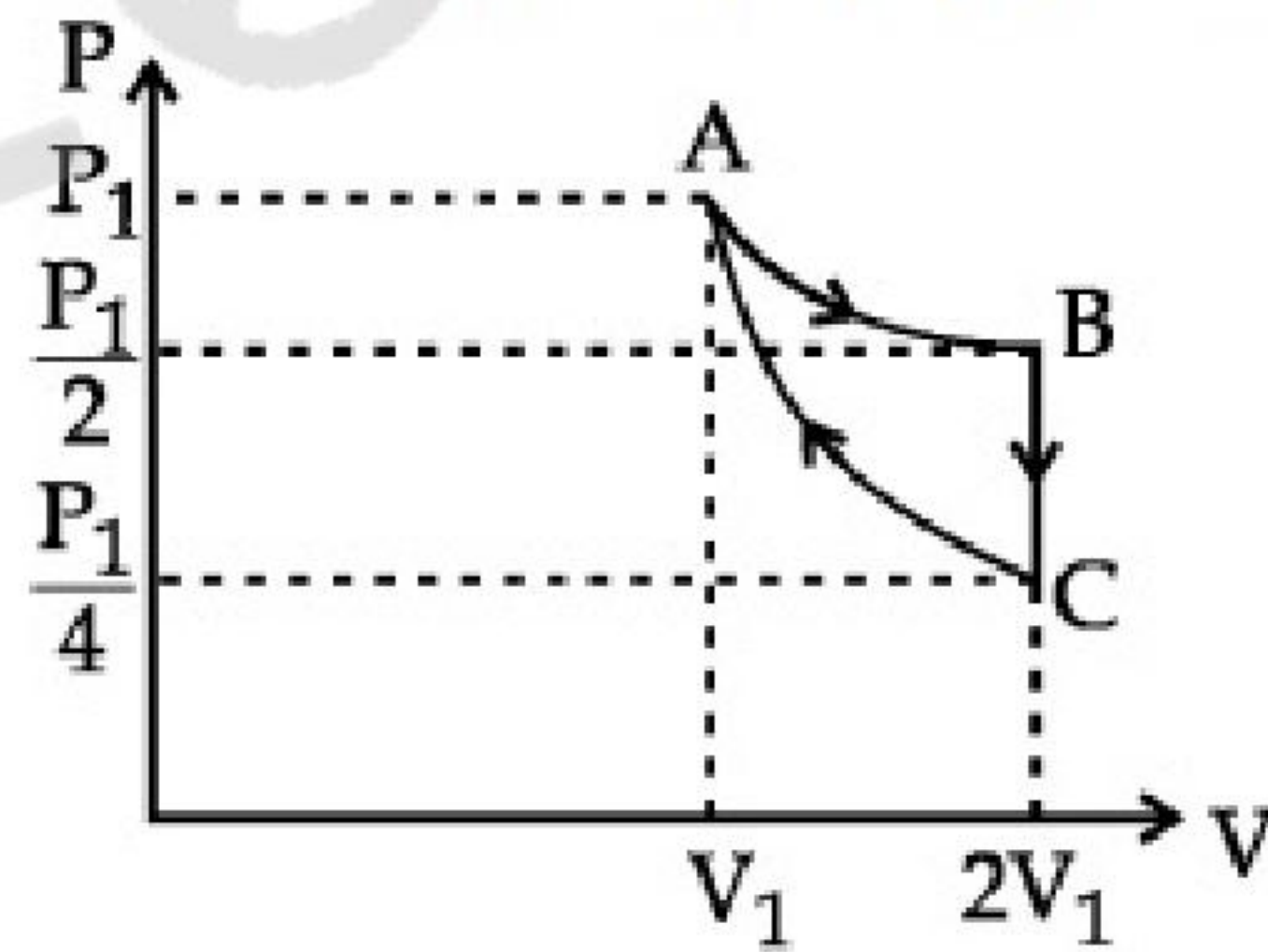
70819157378. $-\frac{RT}{2(\gamma-1)}$

70819157379. RT ln 2

70819157380. 0

Question Number : 5 Question Id : 70819117408 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

کسی مثالی گیس کے ایک مول (1 mole) جس کا دباؤ (P_1, V_1) تپش T_1 کو مرا جعی (reversible) اور ہم تپشی (isothermal) عمل کے ذریعہ پھیلا یا گیا۔ اس کے دباؤ کو ابتدائی دباؤ کا نصف کیا گیا۔ جس کو ترسیم میں خط $(A \rightarrow B)$ کے ذریعہ دکھایا گیا ہے۔ اب اس گیس کو مستقل حجم پر ٹھنڈا کرنے کے عمل کے ذریعہ ابتدائی دباؤ کا ایک چوتھائی کیا گیا۔ اس کو ترسیم میں خط $(B \rightarrow C)$ کے ذریعہ دکھایا گیا ہے۔ اس گیس کو مرا جعی (reversible) اور حرنا گذر (adiabatic) عمل کے ذریعہ واپس اپنی ابتدائی حالت میں لایا گیا جس کو ترسیم میں $(C \rightarrow A)$ کے ذریعہ دکھایا گیا ہو تب اس مکمل عمل کے دوران گیس کے ذریعہ کیا گیا کام مساوی ہے :



Options :

70819157377. $RT \left(\ln 2 - \frac{1}{2(\gamma - 1)} \right)$

70819157378. $-\frac{RT}{2(\gamma - 1)}$

70819157379. RT In 2

70819157380. 0

Question Number : 6 Question Id : 70819117409 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

On the basis of kinetic theory of gases, the gas exerts pressure because its molecules :

Options :

70819157381. continuously lose their energy till it reaches wall.

70819157382. continuously stick to the walls of container.

70819157383. are attracted by the walls of container.

70819157384. suffer change in momentum when impinge on the walls of container.

Question Number : 6 Question Id : 70819117409 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

گیسوں کے نظریہ تحرک کی بنیاد پر کسی گیس کے ذریعہ لگایا دباؤ کی وجہ اس کے سالمات

Options :

70819157381. مسلسل توانائی کو کھوتے ہیں

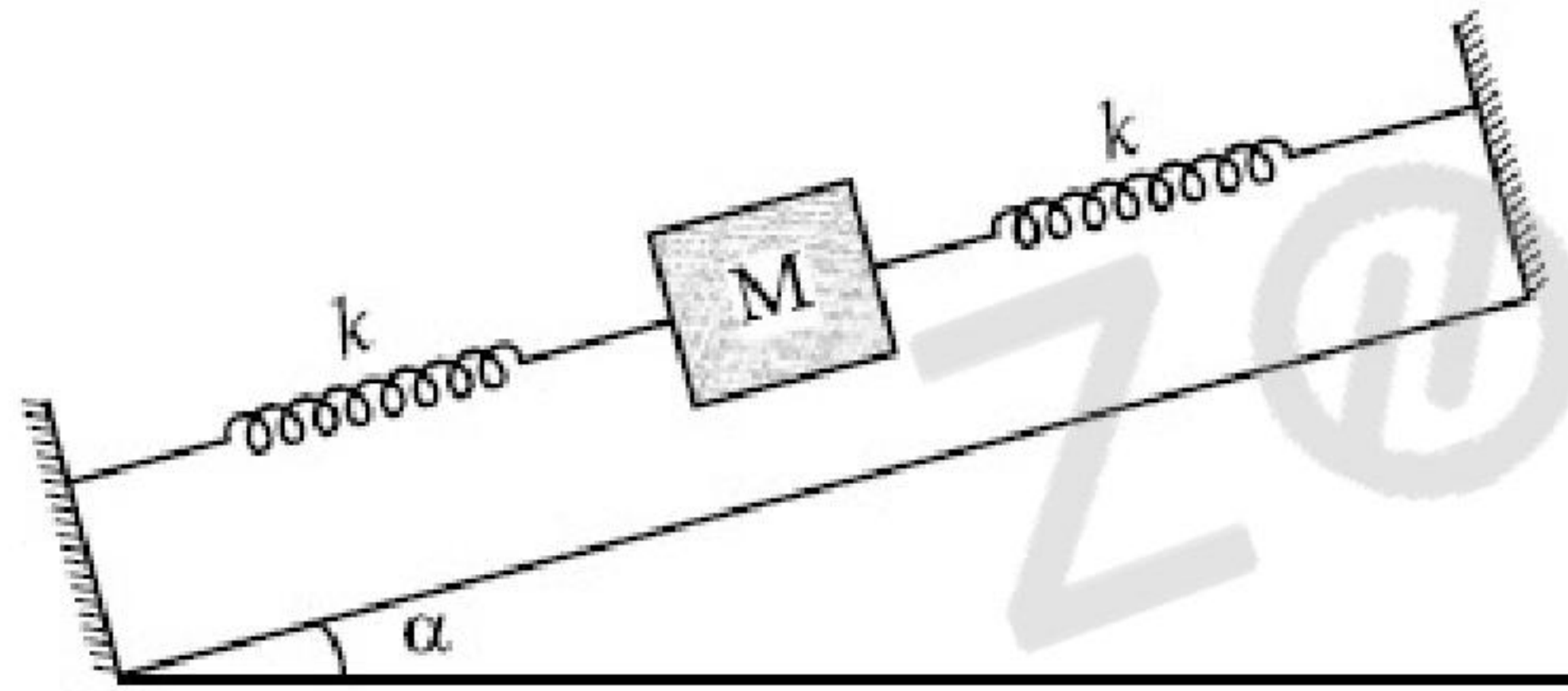
70819157382. مسلسل برتن کی دیوار کو چپکے ہوتے ہیں

70819157383. برتن کی دیوار کی جانب قوت کشش محسوس کرتے ہیں

70819157384. برتن کی دیوار سے جب ٹکراتے ہیں تو ان کے معیار حرکت میں تبدیلی ہوتی ہے

Question Number : 7 Question Id : 70819117410 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

In the given figure, a body of mass M is held between two massless springs, on a smooth inclined plane. The free ends of the springs are attached to firm supports. If each spring has spring constant k , the frequency of oscillation of given body is :



Options :

70819157385. $\frac{1}{2\pi} \sqrt{\frac{k}{Mg \sin \alpha}}$

70819157386. $\frac{1}{2\pi} \sqrt{\frac{2k}{Mg \sin \alpha}}$

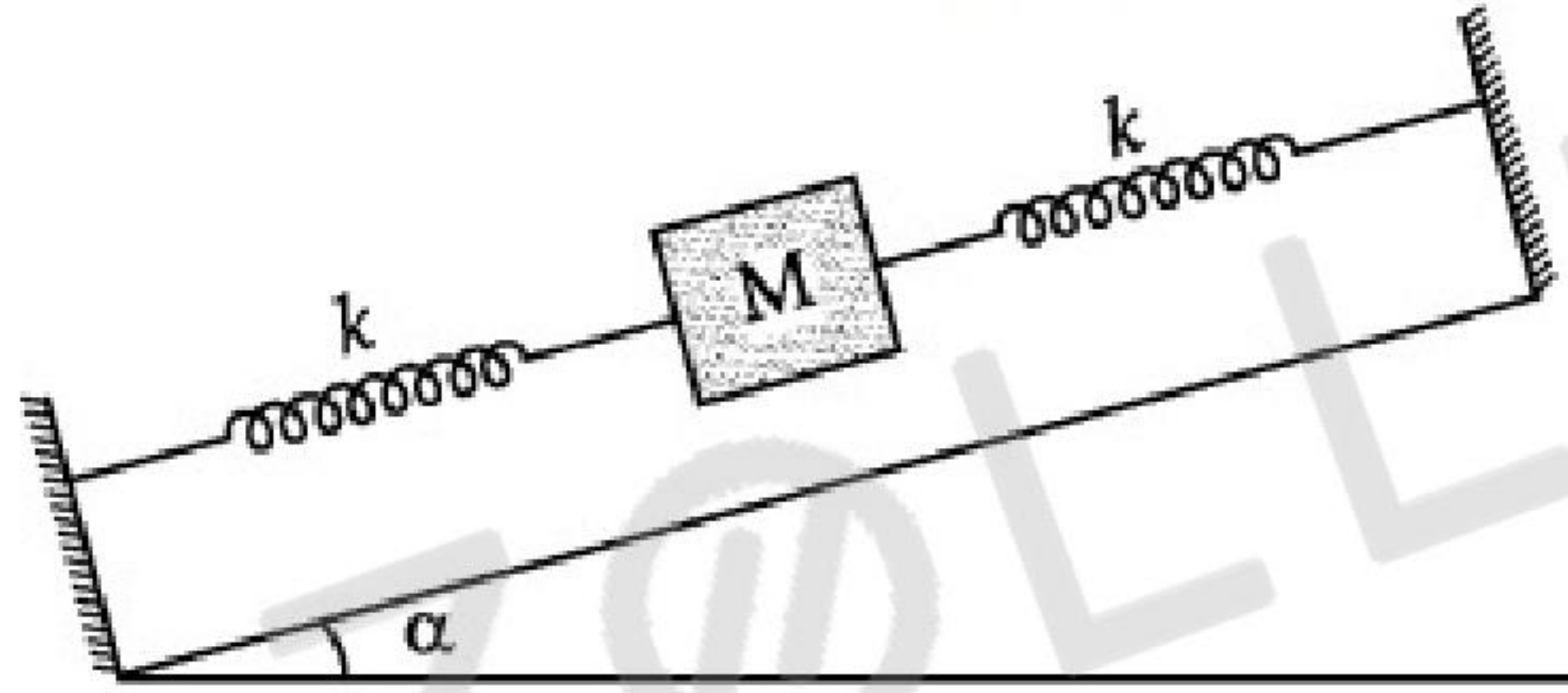
70819157387. $\frac{1}{2\pi} \sqrt{\frac{2k}{M}}$

70819157388.

$$\frac{1}{2\pi} \sqrt{\frac{k}{2M}}$$

Question Number : 7 Question Id : 70819117410 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

شکل کے مطابق M کمیت کی ایک شے کو دو بے کمیت اسپرنگ کے درمیان انحرافی مائل سطح پر نصب کیا گیا۔ ان اسپرنگ کے آزاد سروں کو سہاروں سے باندھا گیا۔ اگر ہر ایک اسپرنگ کا اسپرنگ مستقلہ k ہو تب اس جسم کے ارتعاش کی تعدد :



Options :

70819157385.

$$\frac{1}{2\pi} \sqrt{\frac{k}{Mg \sin \alpha}}$$

70819157386.

$$\frac{1}{2\pi} \sqrt{\frac{2k}{Mg \sin \alpha}}$$

70819157387.

$$\frac{1}{2\pi} \sqrt{\frac{2k}{M}}$$

70819157388. $\frac{1}{2\pi} \sqrt{\frac{k}{2M}}$

Question Number : 8 Question Id : 70819117411 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

When a particle executes SHM, the nature of graphical representation of velocity as a function of displacement is :

Options :

70819157389. circular

70819157390. elliptical

70819157391. parabolic

70819157392. straight line

Question Number : 8 Question Id : 70819117411 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

جب کوئی ذرہ سادہ ہارمونی حرکت کرتا ہے تب اس کی رفتار اور ہٹاؤ کے درمیان ترسیم کی نوعیت :

Options :

70819157389. دائروی

70819157390. بیضوی

70819157391. شاہجی

70819157392. سیدھا خط

Question Number : 9 Question Id : 70819117412 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Which of the following equations represents a travelling wave ?

Options :

70819157393. $y = Ae^x \cos(\omega t - \theta)$

70819157394. $y = Ae^{-x^2} (\nu t + \theta)$

70819157395. $y = A \sin(15x - 2t)$

70819157396. $y = A \sin x \cos \omega t$

Question Number : 9 Question Id : 70819117412 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

درج ذیل میں کونسی حرکت کرنے والی لہر کی مساوات ہے ؟

Options :

70819157393. $y = Ae^x \cos(\omega t - \theta)$

70819157394. $y = Ae^{-x^2} (\nu t + \theta)$

70819157395. $y = A \sin(15x - 2t)$

70819157396. $y = A \sin x \cos \omega t$

Question Number : 10 Question Id : 70819117413 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Two electrons each are fixed at a distance ' $2d$ '. A third charge proton placed at the midpoint is displaced slightly by a distance x ($x \ll d$) perpendicular to the line joining the two fixed charges. Proton will execute simple harmonic motion having angular frequency : (m = mass of charged particle)

Options :

70819157397. $\left(\frac{q^2}{2\pi \epsilon_0 m d^3} \right)^{\frac{1}{2}}$

70819157398. $\left(\frac{2q^2}{\pi \epsilon_0 m d^3} \right)^{\frac{1}{2}}$

70819157399. $\left(\frac{\pi \epsilon_0 m d^3}{2q^2} \right)^{\frac{1}{2}}$

70819157400. $\left(\frac{2\pi \epsilon_0 m d^3}{q^2} \right)^{\frac{1}{2}}$

Question Number : 10 Question Id : 70819117413 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

دو الیکٹرون کو '2d' فاصلے کی دوری پر نصب کیا گیا ہے۔ اب ایک پروٹون کو ان دونوں کے درمیان میں رکھا گیا۔ اس پروٹون کو چھوٹے سے فاصلے x ($x \ll d$) سے ان دونوں الیکٹروں کو جوڑے جانے والے خط کے عمود وار ہٹا کر چھوڑا جائے تب وہ سادہ ہارمونی حرکت کرتا ہے۔ تب اس

SHM کی زاویائی تعدد :

(باردار ذرہ کی کمیت m)

Options :

70819157397. $\left(\frac{q^2}{2\pi\epsilon_0 md^3} \right)^{\frac{1}{2}}$

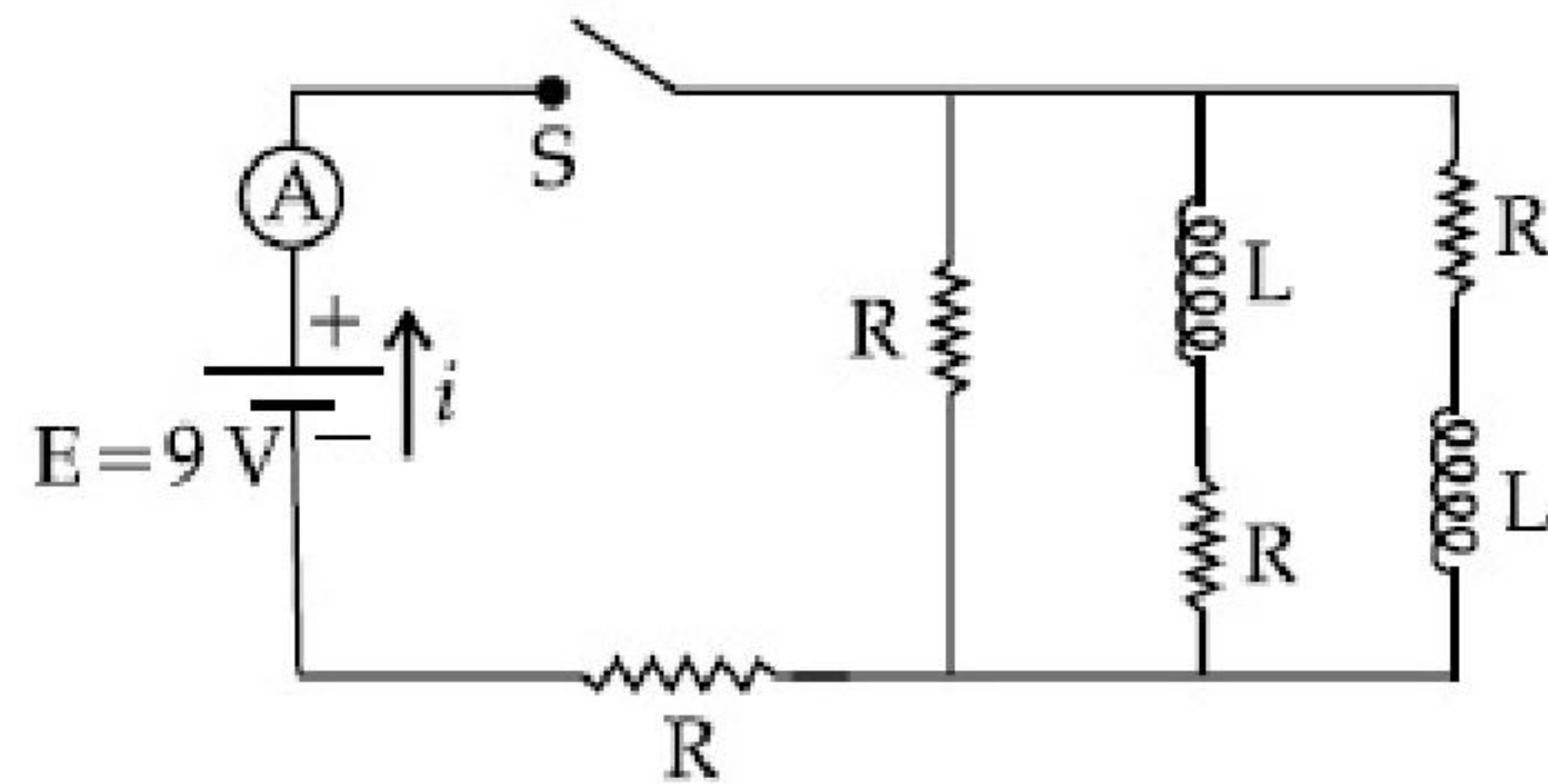
70819157398. $\left(\frac{2q^2}{\pi\epsilon_0 md^3} \right)^{\frac{1}{2}}$

70819157399. $\left(\frac{\pi\epsilon_0 md^3}{2q^2} \right)^{\frac{1}{2}}$

70819157400. $\left(\frac{2\pi\epsilon_0 md^3}{q^2} \right)^{\frac{1}{2}}$

Question Number : 11 Question Id : 70819117414 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Figure shows a circuit that contains four identical resistors with resistance $R = 2.0 \, \Omega$, two identical inductors with inductance $L = 2.0 \, \text{mH}$ and an ideal battery with *emf* $E = 9 \, \text{V}$. The current ' i ' just after the switch ' S ' is closed will be :



Options :

70819157401. 2.25 A

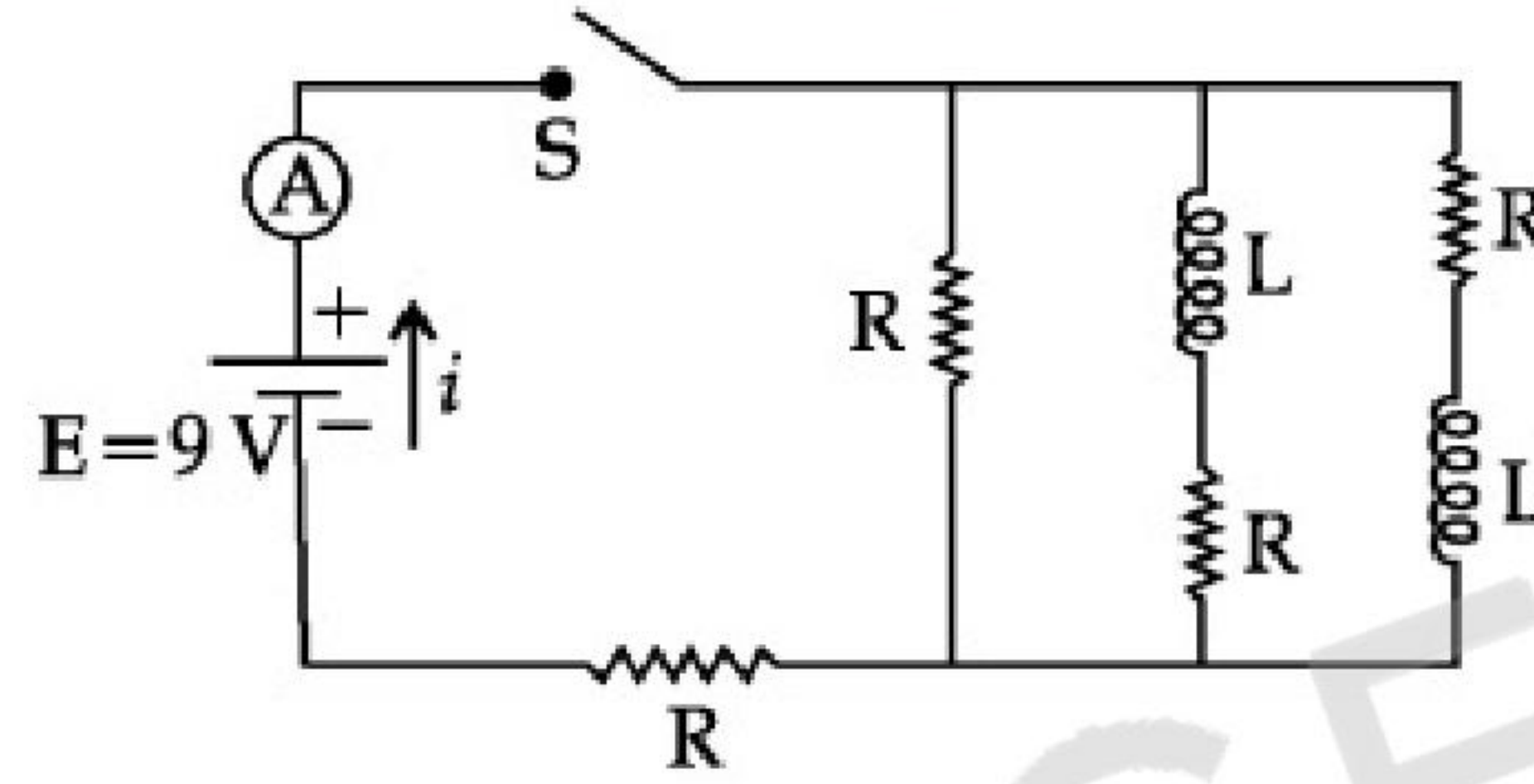
70819157402. 3.0 A

70819157403. 3.37 A

70819157404. 9 A

Question Number : 11 Question Id : 70819117414 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

برقی سرکٹ میں چار مساوی مزاحمت $R = 2.0 \Omega$ ، دو مساوی امالیت والے لچھے $L = 2.0 \text{ mH}$ اور ایک مثالی برقی خانہ $E = 9 \text{ V}$ کو شکل کے مطابق جوڑا گیا ہے۔ جب بٹن 'S' کو بند کر دیں تب بہنے والی برقی کرنٹ 'i' کی قدر :



Options :

70819157401. 2.25 A
70819157402. 3.0 A
70819157403. 3.37 A
70819157404. 9 A

Question Number : 12 Question Id : 70819117415 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

A soft ferromagnetic material is placed in an external magnetic field. The magnetic domains :

Options :

70819157405. increase in size but no change in orientation.
70819157406. decrease in size and changes orientation.

70819157407. may increase or decrease in size and change its orientation.

70819157408. have no relation with external magnetic field.

Question Number : 12 Question Id : 70819117415 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

فیرومقناطیسی مادہ کو بیرونی مقناطیسی میدان میں رکھیں تب اس کے مقناطیسی ڈومین

Options :

70819157405. ساخت میں بڑھتے ہیں اور ان کی سمت میں تبدیلی نہیں ہوتی

70819157406. ساخت میں چھوٹے ہوتے ہیں اور ان کی سمت تبدیل ہوتی ہے

70819157407. ساخت میں چھوٹے یا بڑے ہو سکتے ہیں اور سمت بھی تبدیل ہوتی ہے

70819157408. بیرونی مقناطیسی میدان کے ساتھ کوئی تعلق نہیں ہوتا

Question Number : 13 Question Id : 70819117416 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Match List - I with List - II.

List - I

- (a) Source of microwave frequency
- (b) Source of infrared frequency
- (c) Source of Gamma Rays
- (d) Source of X-rays

List - II

- (i) Radioactive decay of nucleus
- (ii) Magnetron
- (iii) Inner shell electrons
- (iv) Vibration of atoms and molecules
- (v) LASER
- (vi) RC circuit

Choose the correct answer from the options given below :

Options :

70819157409. (a)-(vi), (b)-(v), (c)-(i), (d)-(iv)

70819157410. (a)-(vi), (b)-(iv), (c)-(i), (d)-(v)

70819157411. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

70819157412. (a)-(ii), (b)-(iv), (c)-(vi), (d)-(iii)

Question Number : 13 Question Id : 70819117416 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

فہرست-I اور فہرست-II کو مناسب طور پر جوڑیے :

فہرست-II	فہرست-I
(i) جوہر کے مرکزے کا تابکار تغیر انحطاط	(a) مانگرو لہر کی تعدد کا ذریعہ
(ii) میگنیٹرون (Magnetron)	(b) زیر سرخ تعدد کا ذریعہ
(iii) اندرونی مدار والے الیکٹرون	(c) گاما تعدد کا ذریعہ
(iv) جوہر اور سالمات کی اتھرازی حرکت	(d) X-شعاعوں کا ذریعہ
(v) لیزر (LASER)	
(vi) RC برقی سرکٹ (RC circuit)	

ذیل میں دیئے گئے مقابلات میں سے صحیح جواب چنئے :

Options :

70819157409. (a)-(vi), (b)-(v), (c)-(i), (d)-(iv)

70819157410. (a)-(vi), (b)-(iv), (c)-(i), (d)-(v)

70819157411. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

70819157412. (a)-(ii), (b)-(iv), (c)-(vi), (d)-(iii)

Question Number : 14 Question Id : 70819117417 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

If the source of light used in a Young's double slit experiment is changed from red to violet :

Options :

70819157413. the fringes will become brighter.

70819157414. consecutive fringe lines will come closer.
70819157415. the intensity of minima will increase.
70819157416. the central bright fringe will become a dark fringe.

Question Number : 14 Question Id : 70819117417 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

اگرینگ کے دوہری جھری کے تجربے میں استعمال نور کی طول لہر کو سرخ سے تبدیل کر کے بنفشی (violet) کرویں تب :

Options :

70819157413. حاصل پٹیاں بہت زیادہ منور (چمکدار) ہوں گی
70819157414. حاصل تعمیری مداخل کی مسلسل پٹیاں ایک دوسرے کے قریب ہوں گی
70819157415. حاصل اقل (minima) کی حدت بڑھ جائے گی
70819157416. حاصل مرکزی منور پٹی اب تاریک پٹی میں تبدیل ہوگی

Question Number : 15 Question Id : 70819117418 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

An X-ray tube is operated at 1.24 million volt. The shortest wavelength of the produced photon will be :

Options :

70819157417. 10^{-1} nm

70819157418. 10^{-2} nm

70819157419. 10^{-3} nm

70819157420. 10^{-4} nm

Question Number : 15 Question Id : 70819117418 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

ایک X-شعاع کی نئی 1.24 ملین وولٹ کے قوی پر کام کرتی ہے۔ بتائے اس سے پیدا کی گئیوں (photons) کی سب سے کم طول لہر :

Options :

70819157417. 10^{-1} nm

70819157418. 10^{-2} nm

70819157419. 10^{-3} nm

70819157420. 10^{-4} nm

Question Number : 16 Question Id : 70819117419 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

The de Broglie wavelength of a proton and α -particle are equal. The ratio of their velocities is :

Options :

70819157421. 4 : 1

70819157422. 4 : 2

70819157423. 4 : 3

70819157424. 1 : 4

Question Number : 16 Question Id : 70819117419 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

کسی پروٹون اور α ذرہ کی ڈی بروگلی طول اہر مساوی ہوتے ان کی رفتاروں کی نسبت :

Options :

70819157421. 4 : 1

70819157422. 4 : 2

70819157423. 4 : 3

70819157424. 1 : 4

Question Number : 17 Question Id : 70819117420 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

According to Bohr atom model, in which of the following transitions will the frequency be maximum ?

Options :

70819157425. $n=2$ to $n=1$

70819157426. $n=3$ to $n=2$

70819157427. $n=4$ to $n=3$

70819157428. $n=5$ to $n=4$

Question Number : 17 Question Id : 70819117420 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

بوہر جوہری نظریے کے مطابق درجہ ذیل میں کس مدار کی تبدیلی کے دوران سب سے زیادہ تعدد حاصل ہوگی ؟

Options :

70819157425. $n=1$ سے $n=2$

70819157426. $n=2$ سے $n=3$

70819157427. $n=3$ سے $n=4$

70819157428. $n=4$ سے $n=5$

Question Number : 18 Question Id : 70819117421 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Zener breakdown occurs in a $p-n$ junction having p and n both :

Options :

70819157429. lightly doped and have narrow depletion layer.

70819157430. lightly doped and have wide depletion layer.

70819157431. heavily doped and have narrow depletion layer.

70819157432. heavily doped and have wide depletion layer.

Question Number : 18 Question Id : 70819117421 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

$p-n$ جنکشن ڈایوڈ میں زیر بریک ڈاؤن (Zener breakdown) اس وقت ہوتا ہے جب p اور n حصہ

Options :

70819157429. میں آمیزش کم ہو اور عسرت تہہ (depletion layer) پتلی ہو

70819157430. میں آمیزش کم ہو اور عسرت تہہ (depletion layer) کی چوڑائی زیادہ ہو

70819157431. میں آمیزش زیادہ ہو اور عسرت تہہ (depletion layer) پتلی ہو

70819157432. میں آمیزش زیادہ ہو اور عسرت تہہ (depletion layer) کی چوڑائی زیادہ ہو

Question Number : 19 Question Id : 70819117422 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : PN junction diodes can be used to function as transistor, simply by connecting two diodes, back to back, which acts as the base terminal.

Statement II : In the study of transistor, the amplification factor β indicates ratio of the collector current to the base current.

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

Options :

70819157433. Both Statement I and Statement II are true

70819157434. Both Statement I and Statement II are false

70819157435. Statement I is true but Statement II is false

70819157436. Statement I is false but Statement II is true

Question Number : 19 Question Id : 70819117422 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

ذیل میں دو بیان دیئے گئے ہیں :

بیان-I : جب دو ایک جیسے ڈائیوڈ کو پشت بہ پشت جوڑ دیں تو جوڑ والا حصہ اساس (Base) کے طور پر کام کرتا ہے اور ڈائیوڈ کی ترتیب ٹرانسٹر کے طور پر کام کرتی ہے۔

بیان-II : ٹرانسٹر کے مطالعہ کے دوران افزائش کا عنصر (β) (amplification factor) جمع کار برقی کرنٹ (collector current) (I_C) اور اساس کرنٹ (I_B) (Base current) کی نسبت کو بتاتا ہے۔

اوپر دیئے گئے بیان-I اور بیان-II سے متعلق متبادلات نیچے دیئے گئے ہیں۔ ان میں صحیح متبادل چنئے :

Options :

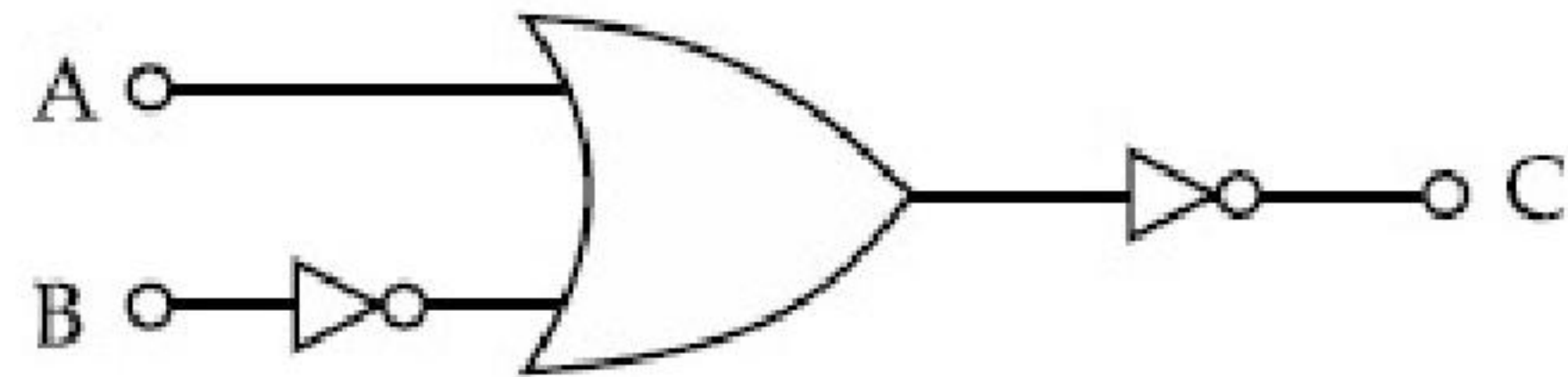
70819157433. دونوں بیان-I اور بیان-II صحیح ہیں

70819157434. دونوں بیان-I اور بیان-II غلط ہیں

70819157435. بیان-I صحیح ہے اور بیان-II غلط ہے

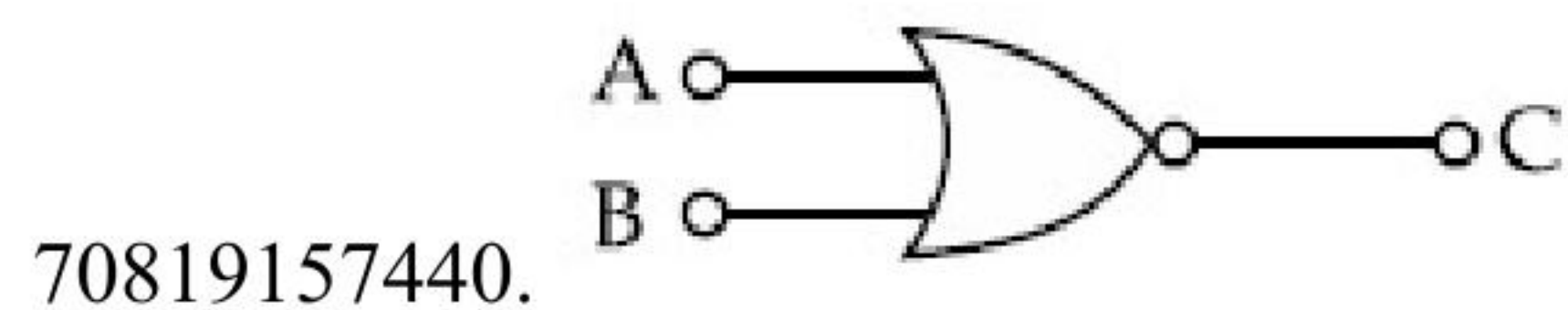
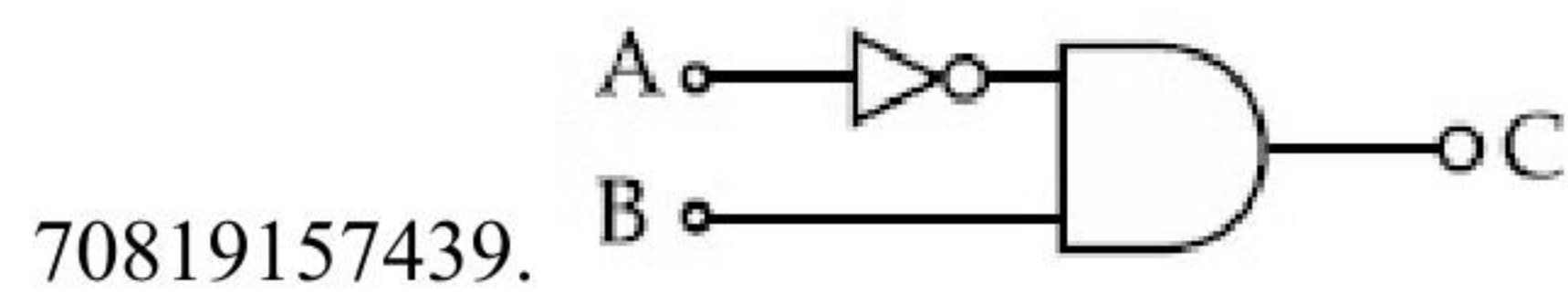
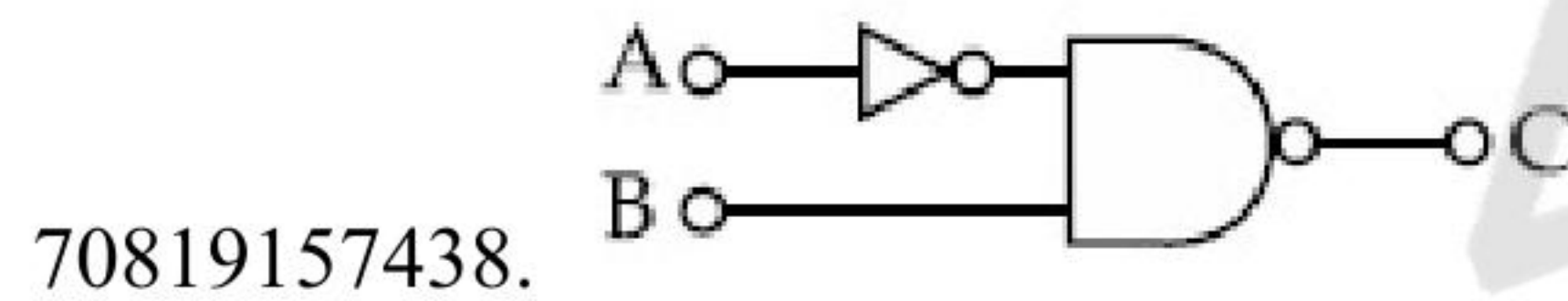
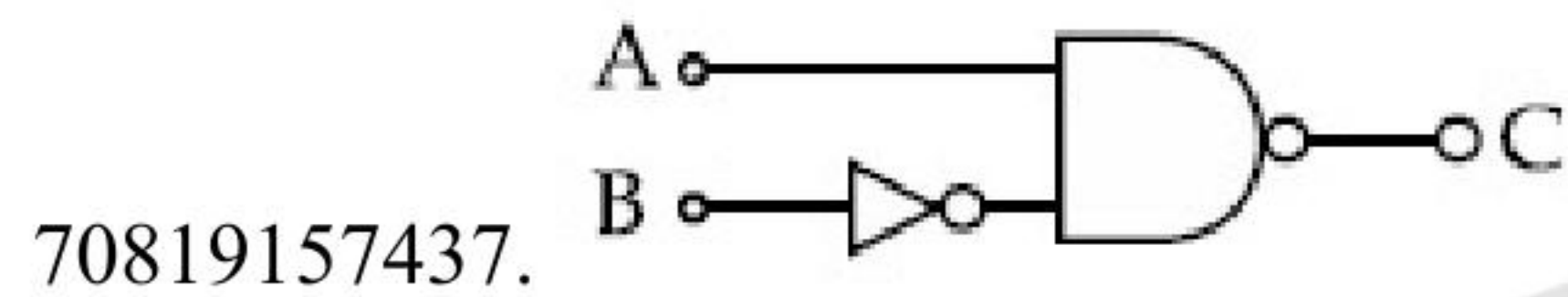
بیان I- غلط ہے اور بیان II- صحیح ہے
70819157436.

Question Number : 20 Question Id : 70819117423 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1



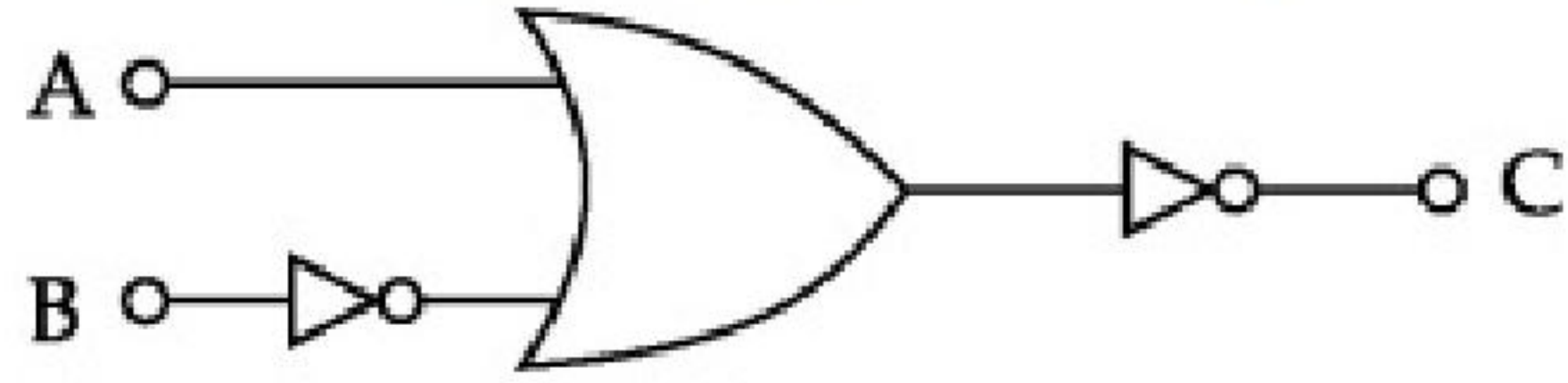
The logic circuit shown above is equivalent to :

Options :

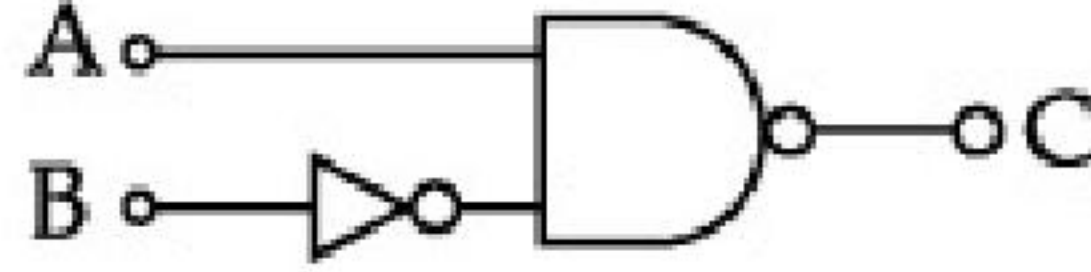


Question Number : 20 Question Id : 70819117423 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

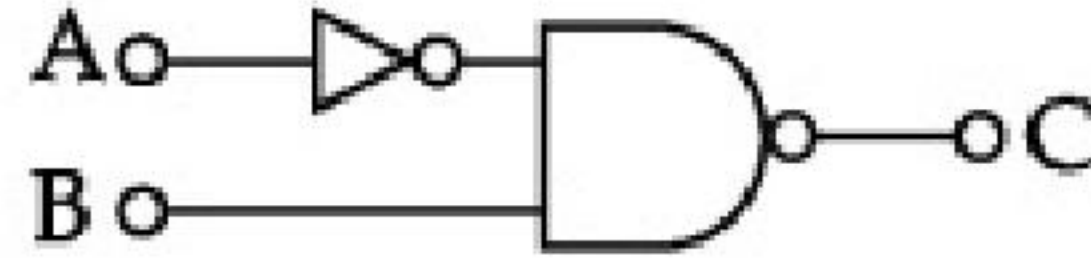
دیے گئے لو جک سرکٹ کے مماثل سرکٹ ہے :



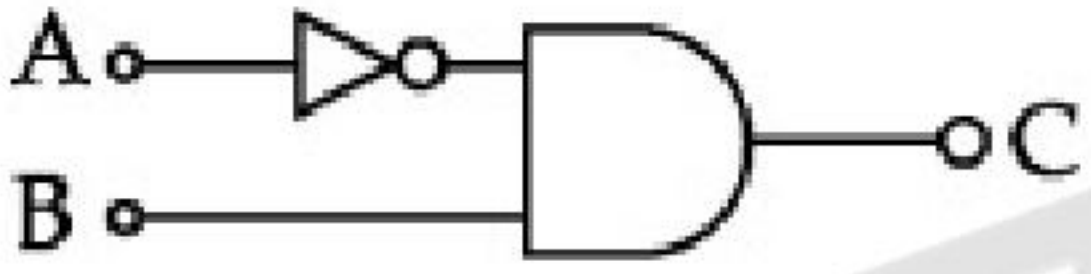
Options :



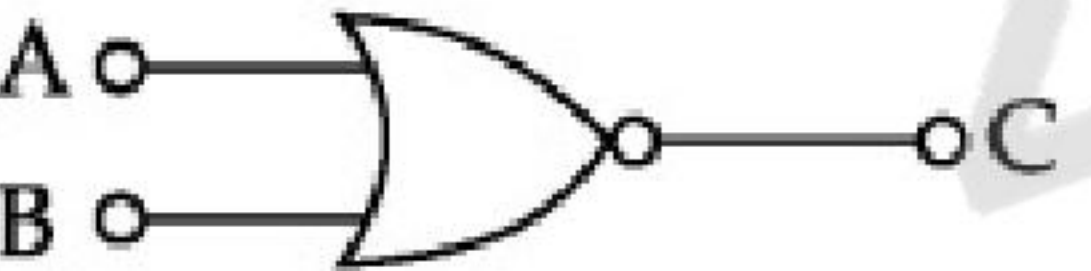
70819157437.



70819157438.



70819157439.



70819157440.

Physics Section B

Section Id :

708191701

Section Number :

2

Section type :

Online

Mandatory or Optional :

Mandatory

Number of Questions :

10

Number of Questions to be attempted :

5

Section Marks :

20

Mark As Answered Required? :

Yes

Sub-Section Number :

1

Sub-Section Id :

708191981

Question Shuffling Allowed :

Yes

Question Number : 21 Question Id : 70819117424 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Two solids A and B of mass 1 kg and 2 kg respectively are moving with equal linear momentum. The ratio of their kinetic energies $(K.E.)_A : (K.E.)_B$ will be $\frac{A}{1}$, so the value of A will be _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 21 Question Id : 70819117424 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

دو ٹھوس A اور B جن کی کمیت بالترتیب 1 kg اور 2 kg ہے وہ ایک ہی معیار حرکت کے ساتھ حرکت کر رہے ہیں۔ ان ٹھوس کی حرکیاتی توانائی $(K.E.)_A : (K.E.)_B$ کی نسبت $\frac{A}{1}$ ہو تب A کی قدر ہوگی _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 22 Question Id : 70819117425 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A uniform metallic wire is elongated by 0.04 m when subjected to a linear force F. The elongation, if its length and diameter is doubled and subjected to the same force will be _____ cm.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 22 Question Id : 70819117425 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

جب کسی یکساں دھاتی تار کو طولی قوت F لگائیں تب اس میں 0.04 m کا کھینچاؤ پیدا ہوتا ہے۔ اگر اسی مادہ کے بنے دو گنی لمبائی اور دو گنی قطر والے تار کو اتنی ہی قوت لگائیں تب اس میں پیدا ہونے والا کھینچاؤ _____ cm ہوگا۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 23 Question Id : 70819117426 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A uniform thin bar of mass 6 kg and length 2.4 meter is bent to make an equilateral hexagon. The moment of inertia about an axis passing through the centre of mass and perpendicular to the plane of hexagon is $\text{_____} \times 10^{-1} \text{ kg m}^2$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 23 **Question Id :** 70819117426 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

6 kg کمیت کی ایک یکساں سلاخ جس کی لمبائی 2.4 m ہے اس کو مرکز ایک مساوی الاضلاع مسدس بنایا گیا۔ تب اس مسدس کے کمیت کے مرکز سے گزرنے والے عمودی محور کے اطراف مسدس کا جمود کا معیار اثر $\text{_____} \times 10^{-1} \text{ kg m}^2$ ہوگا۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 24 **Question Id :** 70819117427 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

The root mean square speed of molecules of a given mass of a gas at 27°C and 1 atmosphere pressure is 200 ms^{-1} . The root mean square speed of molecules of the gas at 127°C and

2 atmosphere pressure is $\frac{x}{\sqrt{3}} \text{ ms}^{-1}$. The value of x will be _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 24 **Question Id :** 70819117427 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

ایک گیس کے دیے گئے کمیت میں سالموں کی جذر اوسط مربع رفتار 27°C اور 1 atmosphere pressure پر 200 ms^{-1} ہے۔ اس
گیس کی 127°C اور 2 atmosphere pressure پر سالموں کی جذر اوسط مربع رفتار $\frac{x}{\sqrt{3}}\text{ ms}^{-1}$ ہے۔ تب x کی قدر
_____ ہوگی۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 25 **Question Id :** 70819117428 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

Two cars are approaching each other at an equal speed of 7.2 km/hr . When they see each other, both blow horns having frequency of 676 Hz . The beat frequency heard by each driver will be _____ Hz . [Velocity of sound in air is 340 m/s .]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 25 Question Id : 70819117428 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

دو کاریں ایک دوسرے کی جانب مساوی رفتار (7.2 km/hr) سے حرکت کر رہی ہیں۔ جب وہ ایک دوسرے کو دیکھتے ہیں تب وہ دونوں ہارن بجاتے ہیں۔ جس کی تعدد 676 Hz ہے۔ ڈرائیور کے ذریعے سنائی دی جانے والی ہیٹ کی تعدد _____ Hz ہوگی۔
[ہوا میں آواز کی رفتار 340 m/s]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

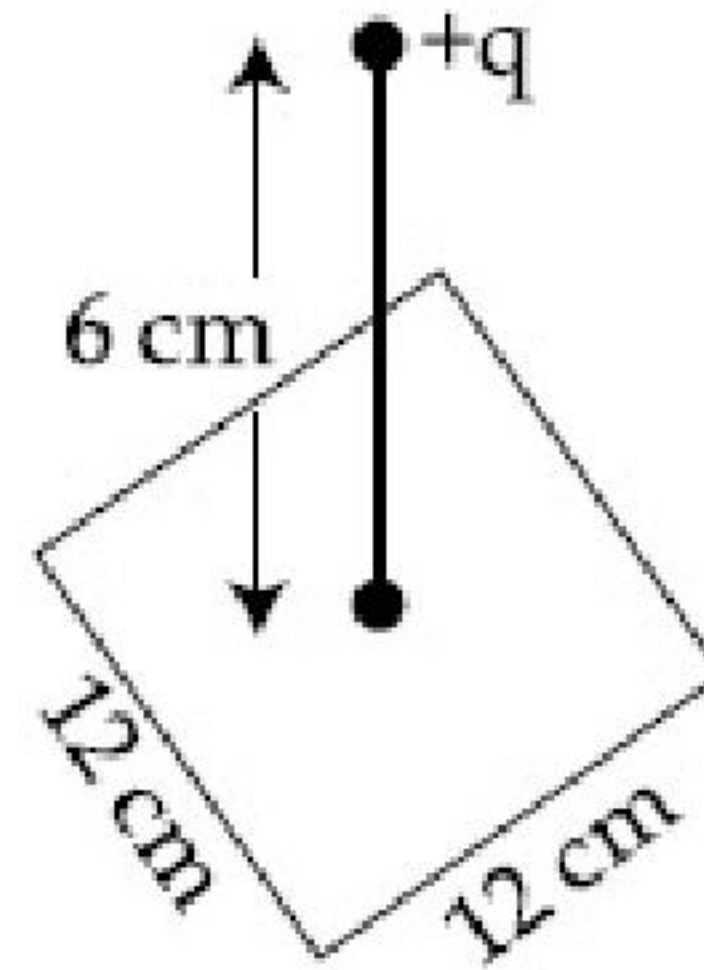
Possible Answers :

5 to 5.001

Question Number : 26 Question Id : 70819117429 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A point charge of $+12\ \mu\text{C}$ is at a distance 6 cm vertically above the centre of a square of side 12 cm as shown in figure. The magnitude of the electric flux through the square will be _____ $\times 10^3\ \text{Nm}^2/\text{C}$.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

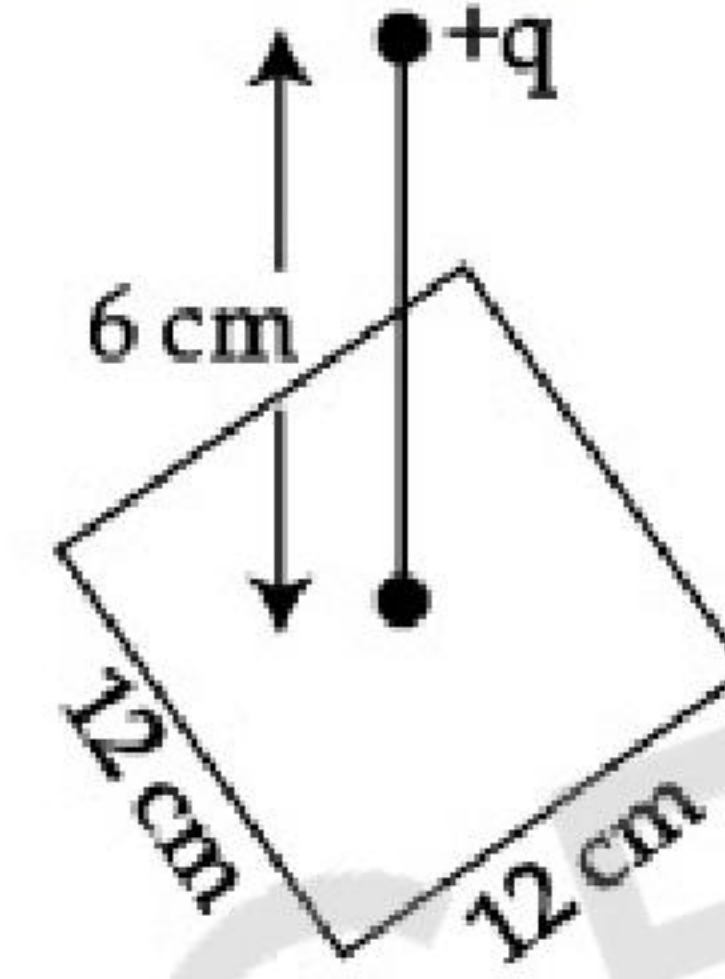
Possible Answers :

5 to 5.001

Question Number : 26 **Question Id :** 70819117429 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

$+12\ \mu\text{C}$ کا ایک نقطی برقی بار 12 cm ضلع کی لمبائی رکھنے والے مربع کے مرکز سے 6 cm کی بلندی کے فاصلہ پر رکھا گیا ہے۔ جیسا کہ شکل میں دکھایا گیا ہے۔ اس صورت میں مربع کی سطح سے گزرنے والا برقی فلکس $\times 10^3\text{ Nm}^2/\text{C}$ ہوگا۔



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 27 **Question Id :** 70819117430 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

A cylindrical wire of radius 0.5 mm and conductivity $5 \times 10^7\text{ S/m}$ is subjected to an electric field of 10 mV/m . The expected value of current in the wire will be $x^3\pi\text{ mA}$. The value of x is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 27 Question Id : 70819117430 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ایک استوانہ نما تار کا نصف قطر 0.5 mm اور برقی ایصالیت $5 \times 10^7 \text{ S/m}$ ہے۔ اس کو 10 mV/m کا برقی میدان لگایا گیا ہو تب اس سے بہنے والی برقی کرنٹ $x^3 \pi \text{ mA}$ حاصل ہوتی ہے۔ اس صورت میں x کی قدر _____ ہوگی۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 28 Question Id : 70819117431 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A series LCR circuit is designed to resonate at an angular frequency $\omega_0 = 10^5 \text{ rad/s}$. The circuit draws 16 W power from 120 V source at resonance. The value of resistance 'R' in the circuit is _____ Ω .

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 28 Question Id : 70819117431 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ایک تسلسل LCR سرکٹ کو اس طرح بنایا گیا کہ اس کی گمگ کی زاویائی تعدد $\omega_0 = 10^5 \text{ rad/s}$ ہے۔ اس برقی سرکٹ کو 120 V کے قومی سے جوڑیں تب گمگ پر 16 W کی طاقت استعمال کرتا ہے۔ تب اس برقی سرکٹ میں مزاحمت 'R' کی قدر Ω ہوگی۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 29 **Question Id :** 70819117432 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

An electromagnetic wave of frequency 3 GHz enters a dielectric medium of relative electric permittivity 2.25 from vacuum. The wavelength of this wave in that medium will be $\text{_____} \times 10^{-2} \text{ cm}$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 29 **Question Id :** 70819117432 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

ایک برقی مقناطیسی لہر کی تعدد 3 GHz ہے۔ وہ خلا سے 2.25 برقی نفوذ پذیری رکھنے والے برقی روک مادے میں داخل ہوتی ہو تب اس مادہ میں اس لہر کی طول لہر $\text{_____} \times 10^{-2} \text{ cm}$ ہوگی۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 30 Question Id : 70819117433 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A signal of 0.1 kW is transmitted in a cable. The attenuation of cable is -5 dB per km and cable length is 20 km. The power received at receiver is 10^{-x} W. The value of x is _____.

$$[\text{Gain in dB} = 10 \log_{10} \left(\frac{P_o}{P_i} \right)]$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 30 Question Id : 70819117433 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ایک کیبل کے ذریعہ 0.1 kW کے سگنل کی ترسیل کی گئی۔ اس کیبل میں تغیر attenuation (سگنل میں کمی) -5 dB per km ہے۔ اور کیبل کی لمبائی 20 km ہے۔ حصول کار Receiver کے ذریعہ حاصل کیا گیا طاقت 10^{-x} W ہوگی۔ تب x کی قیمت _____

$$[\text{Gain in dB} = 10 \log_{10} \left(\frac{P_o}{P_i} \right)] \text{ جب کہ}$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Chemistry Section A

Section Id :	708191702
Section Number :	3
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	708191982
Question Shuffling Allowed :	Yes

**Question Number : 31 Question Id : 70819117434 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1**

According to Bohr's atomic theory :

(A) Kinetic energy of electron is $\propto \frac{Z^2}{n^2}$.

(B) The product of velocity (v) of electron and principal quantum number (n), 'vn' $\propto Z^2$.

(C) Frequency of revolution of electron in an orbit is $\propto \frac{Z^3}{n^3}$.

(D) Coulombic force of attraction on the electron is $\propto \frac{Z^3}{n^4}$.

Choose the most appropriate answer from the options given below :

Options :

70819157451. (A), (C) and (D) only

70819157452. (A) and (D) only

70819157453. (C) only

70819157454. (A) only

Question Number : 31 Question Id : 70819117434 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

بوہر کے جوہری نظریہ کے مطابق :

(A) الیکٹران کی توانائی بالحرکت $\propto \frac{Z^2}{n^2}$ ہے۔

(B) الیکٹران سے حاصل شدے کی رفتار (v) اور پرنسپل کوئم نمبر (n) $'vn' \propto Z^2$

(C) الیکٹران کے چکر لگانے کی طول موج، ایک مدار میں $\propto \frac{Z^3}{n^3}$ ہے۔

(D) کولمب کی قوت کشش (Coulombic Force of Attraction) الیکٹران پر $\propto \frac{Z^3}{n^4}$ ہے۔

مندرجہ ذیل میں سے مناسب جواب چن کر لکھئے۔

Options :

70819157451. (A) ، (C) اور (D) صرف

70819157452. (A) اور (D) صرف

70819157453. (C) صرف

70819157454. (A) صرف

Question Number : 32 Question Id : 70819117435 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The correct shape and I – I – I bond angles respectively in I_3^- ion are :

Options :

70819157455. Linear; 180°

70819157456. Distorted trigonal planar; 135° and 90°

70819157457. T-shaped; 180° and 90°

70819157458. Trigonal planar; 120°

Question Number : 32 Question Id : 70819117435 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

مندرجہ ذیل میں I_3^- آئن کا صحیح ہیئت (shape) اور زاویے $I-I-I$ بالترتیب اس طرح ہیں :

Options :

70819157455. Linear; 180°

70819157456. Distorted trigonal planar; 135° and 90°

70819157457. T-shaped; 180° and 90°

70819157458. Trigonal planar; 120°

Question Number : 33 Question Id : 70819117436 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Most suitable salt which can be used for efficient clotting of blood will be :

Options :

70819157459. $NaHCO_3$

70819157460. $\text{Mg}(\text{HCO}_3)_2$

70819157461. FeCl_3

70819157462. FeSO_4

Question Number : 33 Question Id : 70819117436 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

مندرجہ ذیل میں کونسا مناسب نمک ہو سکتا ہے جو خون کو روکنے (clotting of blood) کے لیے مفید ثابت ہوگا :

Options :

70819157459. NaHCO_3

70819157460. $\text{Mg}(\text{HCO}_3)_2$

70819157461. FeCl_3

70819157462. FeSO_4

Question Number : 34 Question Id : 70819117437 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

The correct set from the following in which both pairs are in correct order of melting point is :

Options :

70819157463. $\text{LiCl} > \text{LiF} ; \text{MgO} > \text{NaCl}$

70819157464. $\text{LiF} > \text{LiCl} ; \text{MgO} > \text{NaCl}$

70819157465. $\text{LiCl} > \text{LiF} ; \text{NaCl} > \text{MgO}$

70819157466. $\text{LiF} > \text{LiCl} ; \text{NaCl} > \text{MgO}$

Question Number : 34 Question Id : 70819117437 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

مندرجہ ذیل سیٹ کو صحیح جوڑیوں کے درجے ان کے نقطہ پگھلاؤ (melting point) کی بنا پر رکھئے :

Options :

70819157463. $\text{LiCl} > \text{LiF} ; \text{MgO} > \text{NaCl}$

70819157464. $\text{LiF} > \text{LiCl} ; \text{MgO} > \text{NaCl}$

70819157465. $\text{LiCl} > \text{LiF} ; \text{NaCl} > \text{MgO}$

70819157466. $\text{LiF} > \text{LiCl} ; \text{NaCl} > \text{MgO}$

Question Number : 35 Question Id : 70819117438 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Match List - I with List - II.

List - I		List - II	
(Metal)		(Ores)	
(a)	Aluminium	(i)	Siderite
(b)	Iron	(ii)	Calamine
(c)	Copper	(iii)	Kaolinite
(d)	Zinc	(iv)	Malachite

Choose the correct answer from the options given below :

Options :

70819157467. (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

70819157468. (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

70819157469. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

70819157470. (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

Question Number : 35 Question Id : 70819117438 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

فہرست-I اور فہرست-II کو ملائیے :

فہرست-II

فہرست-I

(کچدھات)

(دھات)

Siderite (i)

Aluminium (a)

Calamine (ii)

Iron (b)

Kaolinite (iii)

Copper (c)

Malachite (iv)

Zinc (d)

مندرجہ ذیل میں صحیح جواب چن کر لکھئے :

Options :

70819157467. (a)-(i), (b)-(ii), (c)-(iii), (d)-(iv)

70819157468. (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

70819157469. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

70819157470. (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

Question Number : 36 Question Id : 70819117439 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

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

Assertion A : Hydrogen is the most abundant element in the Universe, but it is not the most abundant gas in the troposphere.

Reason R : Hydrogen is the lightest element.

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

Options :

70819157471. Both A and R are true and R is the correct explanation of A

70819157472. Both A and R are true but R is NOT the correct explanation of A

70819157473. A is true but R is false

70819157474. A is false but R is true

Question Number : 36 Question Id : 70819117439 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

ذیل میں دو بیانات دیئے گئے ہیں۔ ایک کو Assertion یعنی A اور دوسرے کو Reason یعنی R کہا گیا ہے۔

A Assertion : (یقینی طور پر دعویٰ کے ساتھ) ہائیڈروجن کائنات میں سب سے زیادہ پیمانے پر موجود ہے لیکن یہ troposphere میں زیادہ پیمانے پر پائی جانے والی گیس نہیں ہے۔

R Reason : (وجہ) ہائیڈروجن سب سے ہلکی ہوتی ہے۔

مندرجہ بالا بیانات کی روشنی میں مندرجہ ذیل میں سے صحیح جواب چن کر لکھئے :

Options :

70819157471. A اور R دونوں صحیح ہیں۔ A، R کے بارے میں صحیح وضاحت کرتا ہے۔

70819157472. A اور R دونوں صحیح ہیں۔ لیکن یہاں پر R، A کی صحیح وضاحت نہیں کرتا۔

70819157473. A صحیح ہے لیکن R غلط ہے۔

70819157474. A غلط ہے لیکن R صحیح ہے۔

Question Number : 37 Question Id : 70819117440 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

Match List - I with List - II.

List - I		List - II	
(Salt)		(Flame colour wavelength)	
(a)	LiCl	(i)	455.5 nm
(b)	NaCl	(ii)	670.8 nm
(c)	RbCl	(iii)	780.0 nm
(d)	CsCl	(iv)	589.2 nm

Choose the correct answer from the options given below :

Options :

70819157475. (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)

70819157476. (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)

70819157477. (a)-(i), (b)-(iv), (c)-(ii), (d)-(iii)

70819157478. (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

Question Number : 37 Question Id : 70819117440 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

فہرست - I کو فہرست - II سے ملائیے :

فہرست - II (شعلے کے رنگ کی طول موج)	فہرست - I (نمک)
455.5 nm (i)	LiCl (a)
670.8 nm (ii)	NaCl (b)
780.0 nm (iii)	RbCl (c)
589.2 nm (iv)	CsCl (d)

مندرجہ ذیل میں سے صحیح جواب چن کر لکھئے :

Options :

70819157475. (a)-(iv), (b)-(ii), (c)-(iii), (d)-(i)

70819157476. (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)

70819157477. (a)-(i), (b)-(iv), (c)-(ii), (d)-(iii)

70819157478. (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

Question Number : 38 Question Id : 70819117441 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

The incorrect statement among the following is :

Options :

70819157479. VOSO_4 is a reducing agent

70819157480. RuO_4 is an oxidizing agent

70819157481. Cr_2O_3 is an amphoteric oxide

70819157482. Red colour of ruby is due to the presence of Co^{3+}

Question Number : 38 Question Id : 70819117441 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

مندرجہ ذیل میں سے کون سے غلط بیان ہے :

Options :

70819157479. VOSO_4 تھوہلی متعامل ہے۔

70819157480. RuO_4 تھسیدی متعامل ہے۔

70819157481. Cr_2O_3 وورخہ آکسائیڈ ہے۔

70819157482. روبي (ruby) کا سرخ رنگ Co^{3+} کی موجودگی کی وجہ سے ہے۔

Question Number : 39 Question Id : 70819117442 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

What is the correct order of the following elements with respect to their density ?

Options :

70819157483. $\text{Cr} < \text{Fe} < \text{Co} < \text{Cu} < \text{Zn}$

70819157484. $\text{Zn} < \text{Cr} < \text{Fe} < \text{Co} < \text{Cu}$

70819157485. $\text{Zn} < \text{Cu} < \text{Co} < \text{Fe} < \text{Cr}$

70819157486. $\text{Cr} < \text{Zn} < \text{Co} < \text{Cu} < \text{Fe}$

Question Number : 39 Question Id : 70819117442 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

مندرجہ ذیل عناصروں کو ان کے کثافت کے صحیح درجے کیا ہے ؟ انہیں اس اعتبار سے ترتیب دیجئے۔

Options :

70819157483. $\text{Cr} < \text{Fe} < \text{Co} < \text{Cu} < \text{Zn}$

70819157484. $\text{Zn} < \text{Cr} < \text{Fe} < \text{Co} < \text{Cu}$

70819157485. $\text{Zn} < \text{Cu} < \text{Co} < \text{Fe} < \text{Cr}$

70819157486. $\text{Cr} < \text{Zn} < \text{Co} < \text{Cu} < \text{Fe}$

Question Number : 40 Question Id : 70819117443 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

The calculated magnetic moments (spin only value) for species $[\text{FeCl}_4]^{2-}$, $[\text{Co}(\text{C}_2\text{O}_4)_3]^{3-}$ and MnO_4^{2-} respectively are :

Options :

70819157487. 4.90, 0 and 1.73 BM

70819157488. 5.92, 4.90 and 0 BM

70819157489. 5.82, 0 and 0 BM

70819157490. 4.90, 0 and 2.83 BM

Question Number : 40 Question Id : 70819117443 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

کی مقناطیسی معیار اثر (صرف گھماؤ قیمت) بالترتیب ہیں : $[\text{FeCl}_4]^{2-}$ ، $[\text{Co}(\text{C}_2\text{O}_4)_3]^{3-}$ اور MnO_4^{2-}

Options :

70819157487. 1.73 BM اور 4.90, 0

70819157488. 0 BM اور 5.92, 4.90

70819157489. 0 BM اور 5.82, 0

70819157490. 2.83 BM اور 4.90, 0

Question Number : 41 Question Id : 70819117444 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : The value of the parameter "Biochemical Oxygen Demand (BOD)" is important for survival of aquatic life.

Statement II : The optimum value of BOD is 6.5 ppm.

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

Options :

70819157491. Both Statement I and Statement II are true

70819157492. Both Statement I and Statement II are false

70819157493. Statement I is true but Statement II is false

70819157494. Statement I is false but Statement II is true

Question Number : 41 Question Id : 70819117444 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

مندرجہ ذیل میں دو بیانات دیئے گئے ہوئے ہیں :

بیان - I : پانی کی آبی زندگی گزارنے کیلئے حیاتی کیمیائی آکسیجن کی مانگ "Biochemical Oxygen Demand (BOD)" کی قیمت اہم ہوتی ہے۔

بیان - II : BOD کی مناسب قیمت 6.5 ppm ہے۔

مندرجہ بالا بیانات کی روشنی میں مندرجہ ذیل میں سے صحیح جواب چن کر لکھئے :

Options :

70819157491. دونوں بیان - I اور بیان - II صحیح ہیں۔

70819157492. دونوں بیان I- اور بیان II- غلط ہیں۔

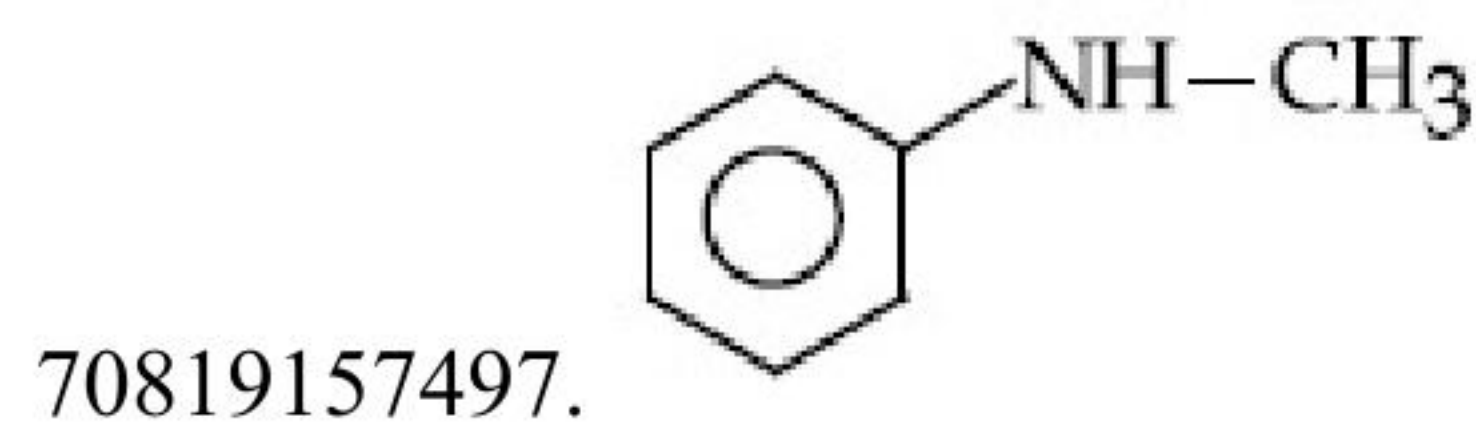
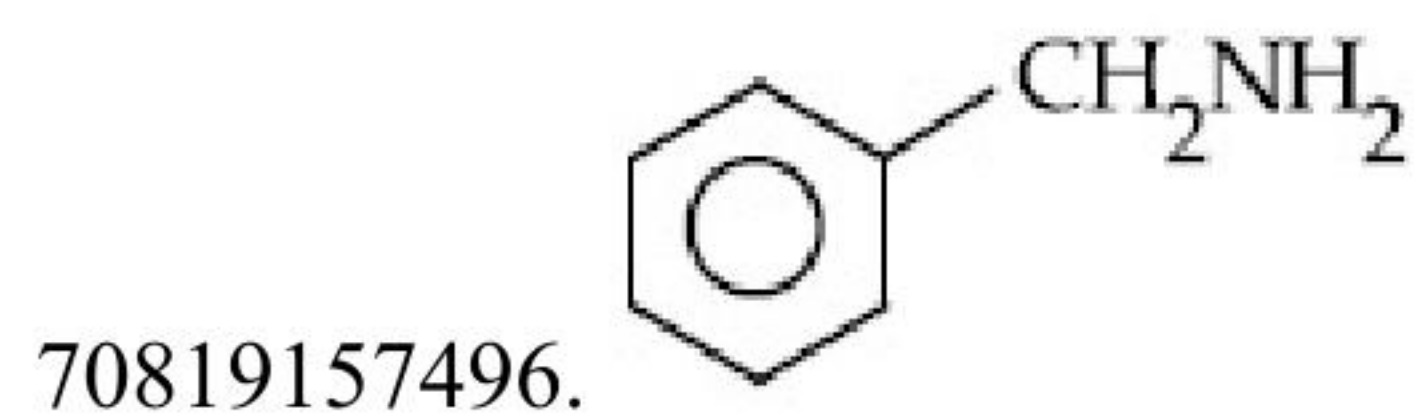
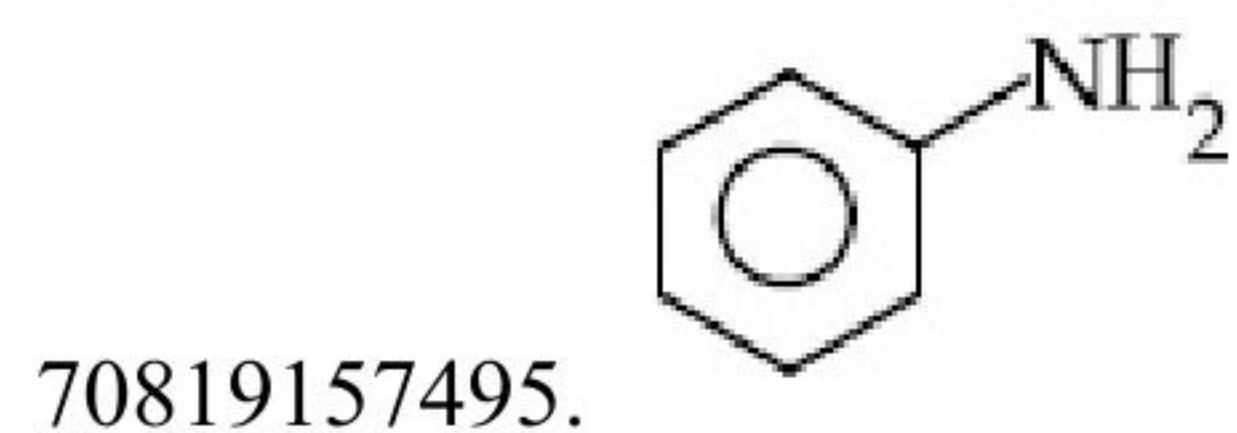
70819157493. بیان I- صحیح ہے اور بیان II- غلط ہے۔

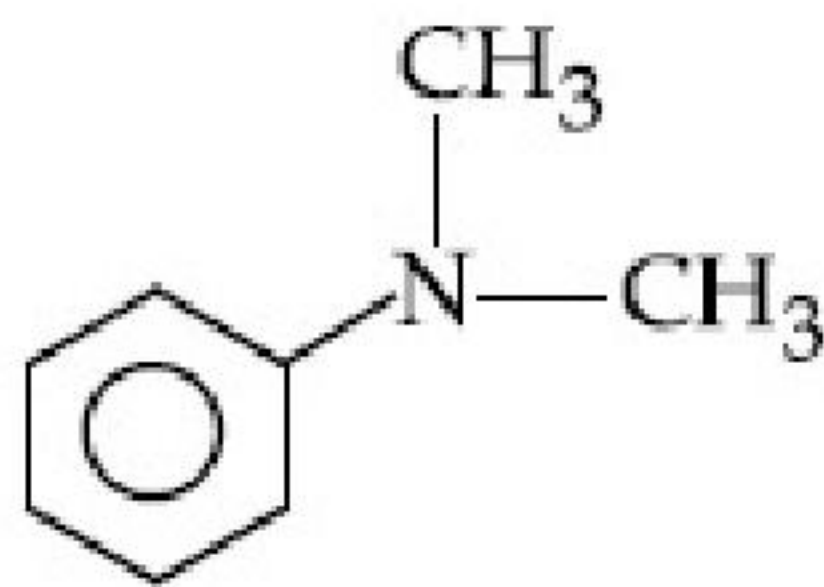
70819157494. بیان I- غلط ہے۔ لیکن بیان II- صحیح ہے۔

Question Number : 42 Question Id : 70819117445 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The diazonium salt of which of the following compounds will form a coloured dye on reaction with β -Naphthol in NaOH ?

Options :



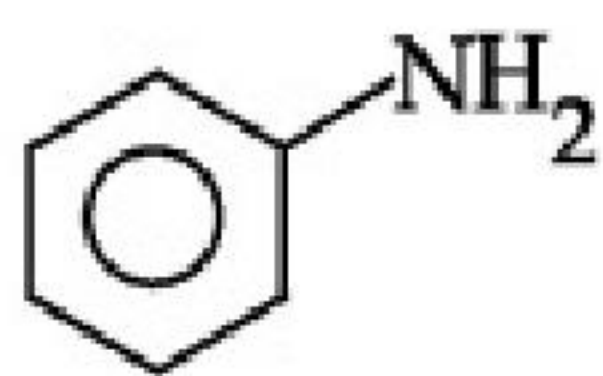


70819157498.

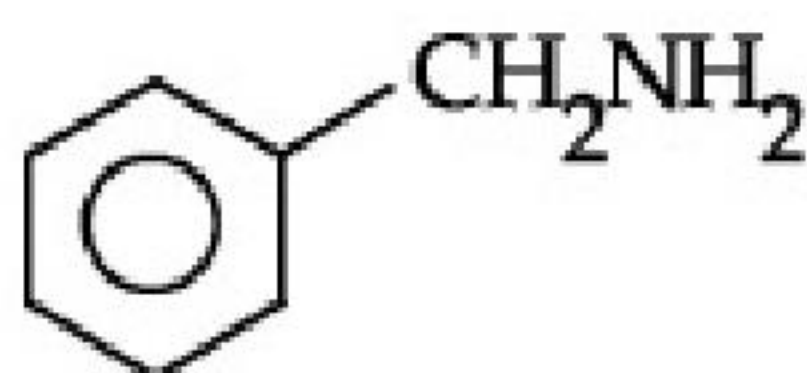
Question Number : 42 Question Id : 70819117445 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

مندرجہ ذیل میں کس مرکب کا ڈائی زونیم نمک NaOH میں β -Naphthol کے ساتھ تعامل کرنے پر رنگین رنگ کا dye دیتا ہے ؟

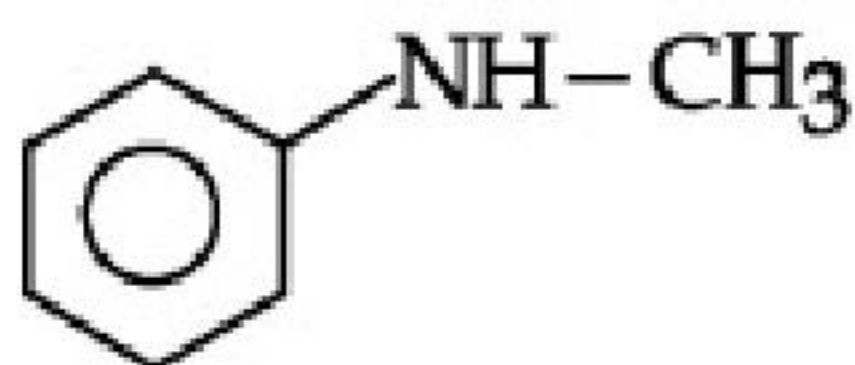
Options :



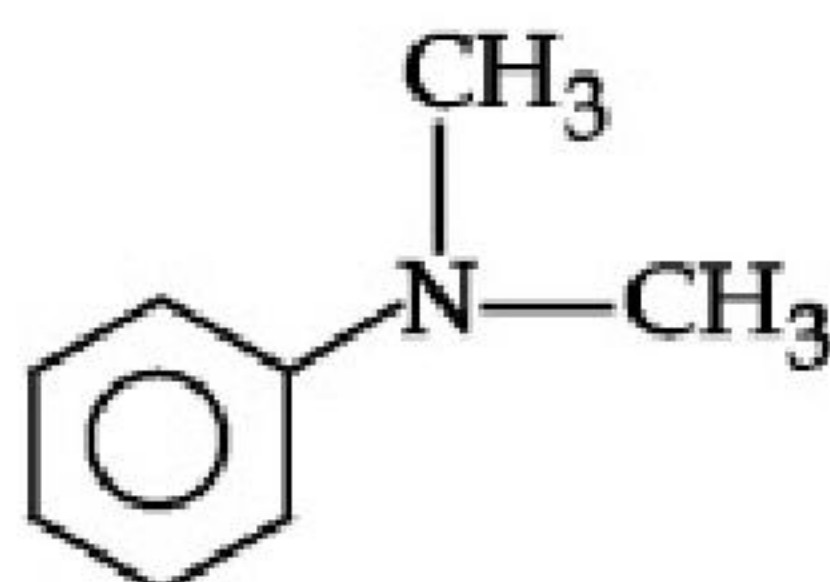
70819157495.



70819157496.



70819157497.

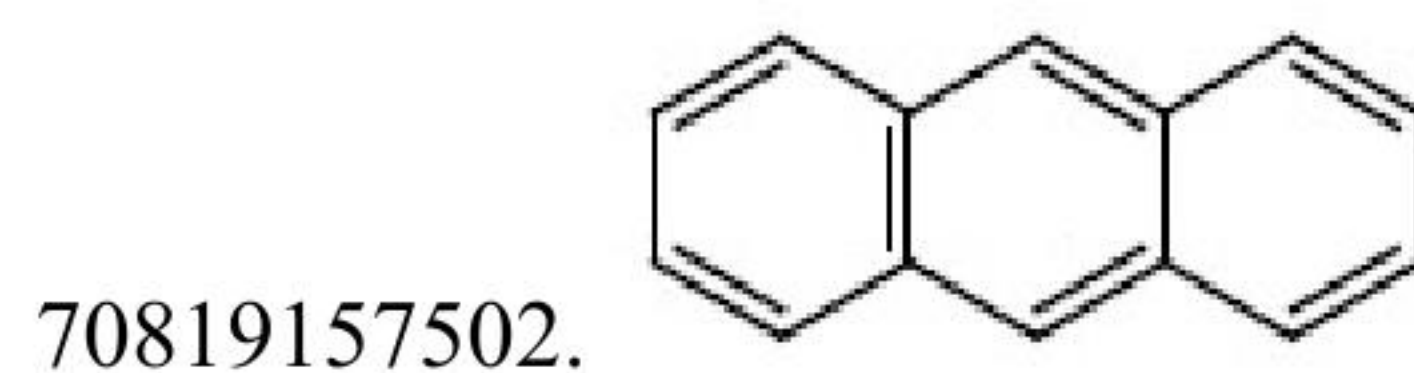
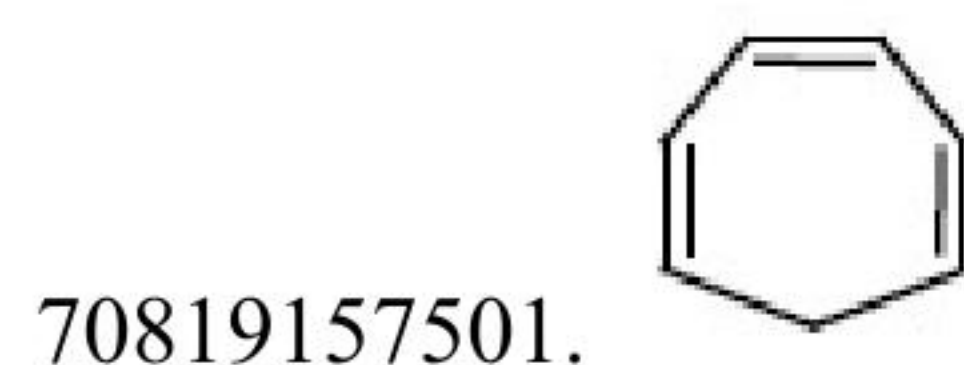
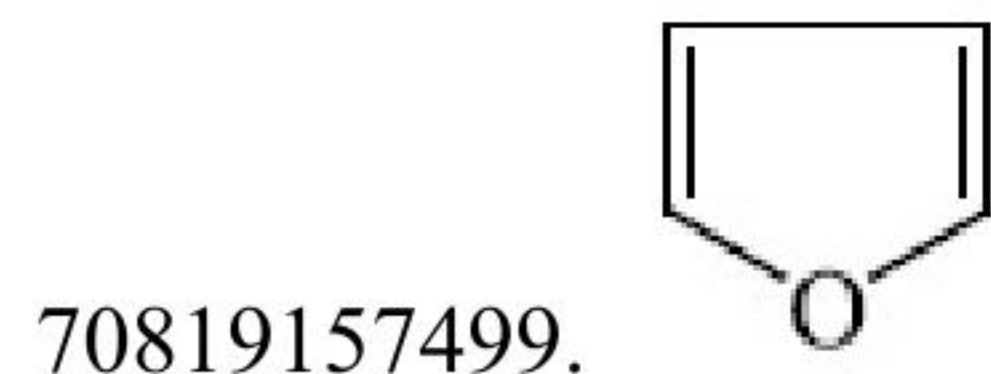


70819157498.

Question Number : 43 Question Id : 70819117446 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Which one of the following compounds is non-aromatic ?

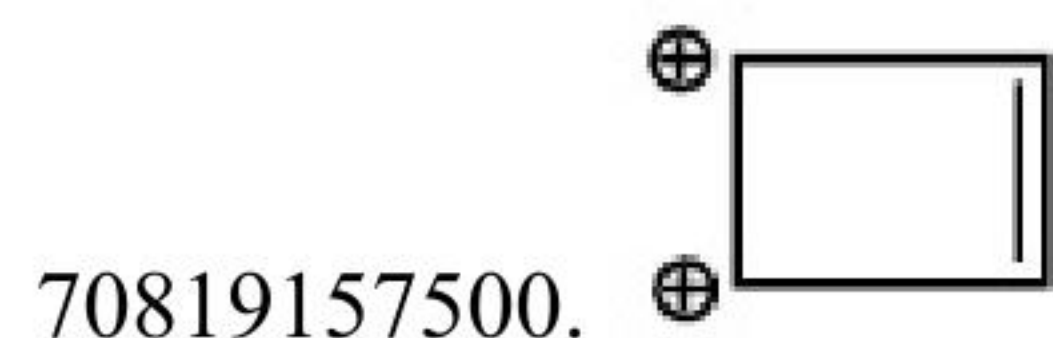
Options :



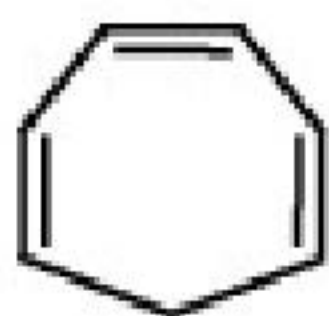
Question Number : 43 Question Id : 70819117446 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

مندرجہ ذیل میں کونسا مرکب ارویتیک نہیں ہے۔

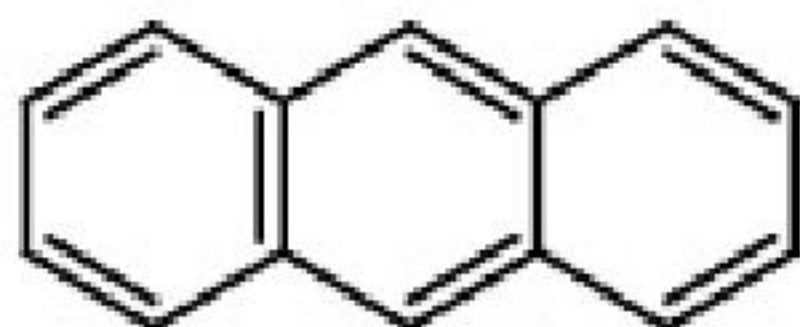
Options :



70819157501.



70819157502.

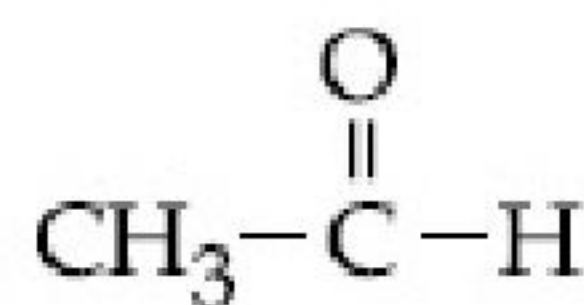


Question Number : 44 Question Id : 70819117447 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

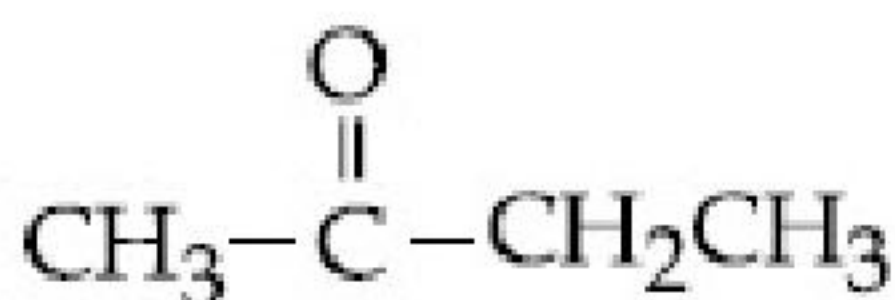
Which one of the following carbonyl compounds cannot be prepared by addition of water on an alkyne in the presence of HgSO_4 and H_2SO_4 ?

Options :

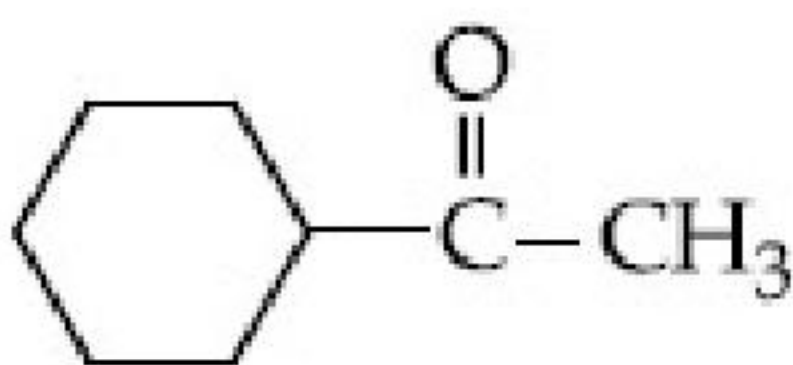
70819157503.



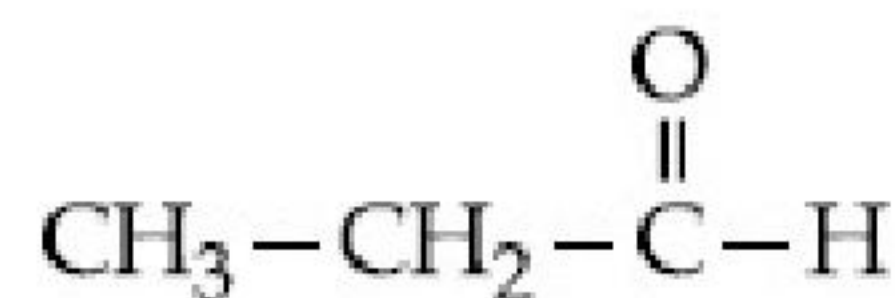
70819157504.



70819157505.



70819157506.

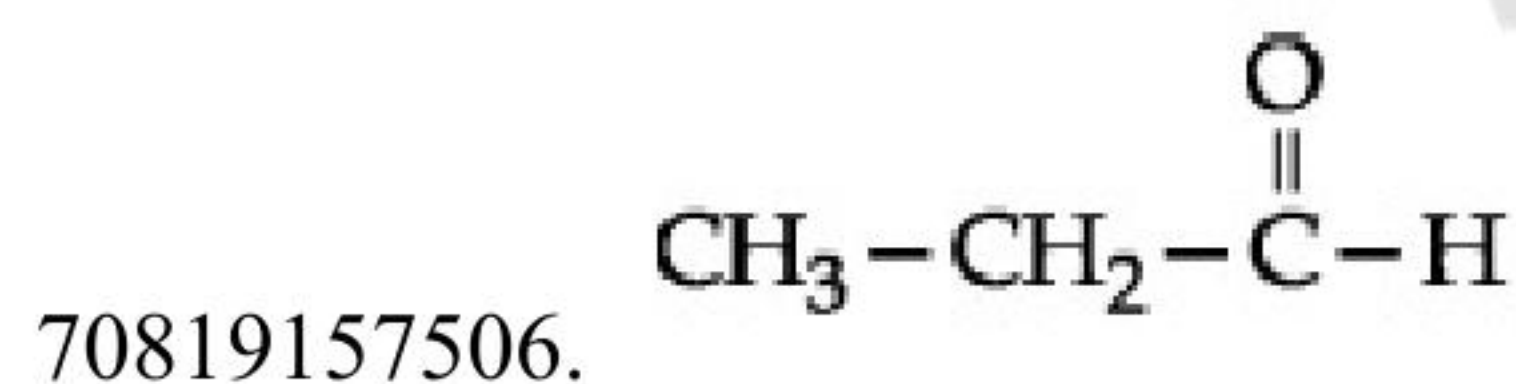
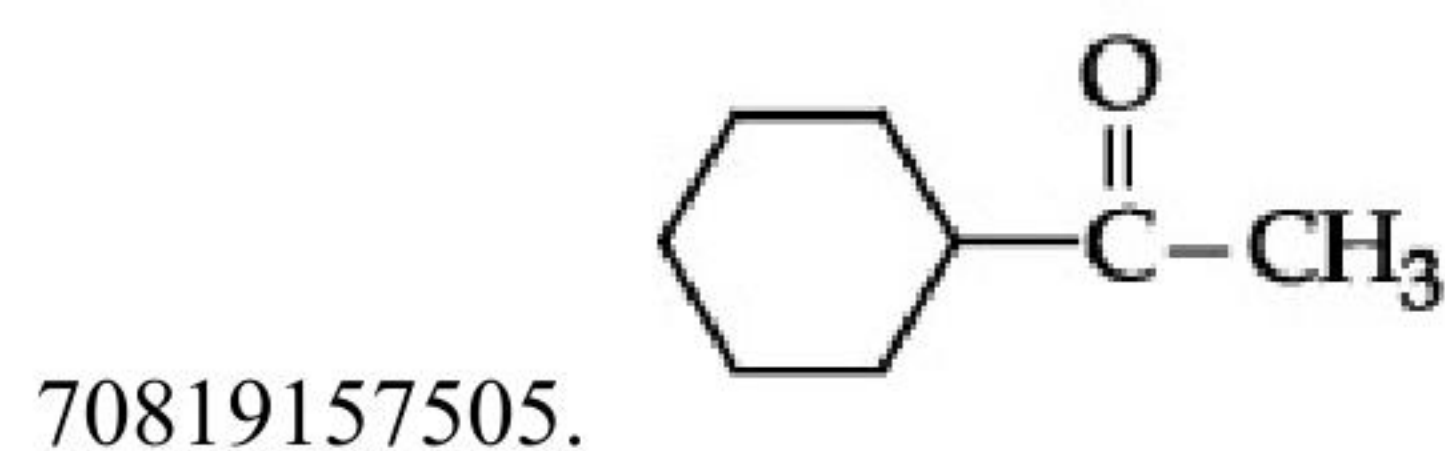
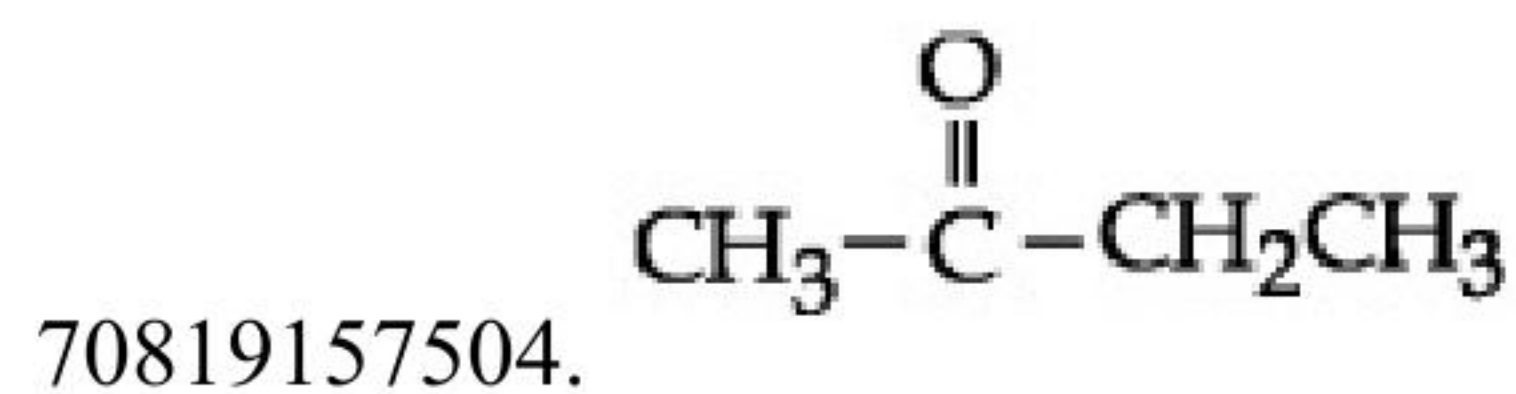
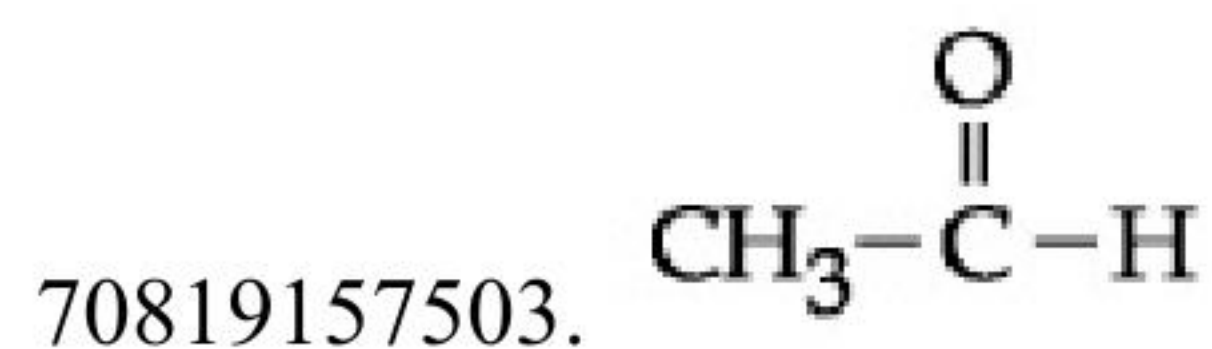


Question Number : 44 Question Id : 70819117447 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

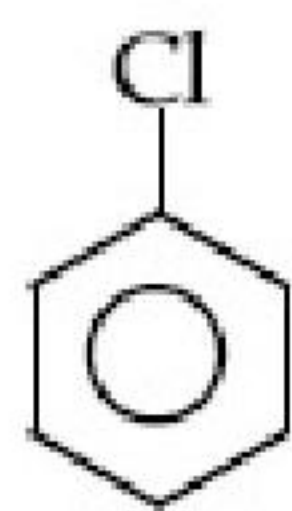
کی موجودگی میں الکائن میں پانی ملانے پر ذیل میں سے کونسا کاربونل مرکب نہیں بنایا جاسکتا ہے ؟ H_2SO_4 اور HgSO_4

Options :

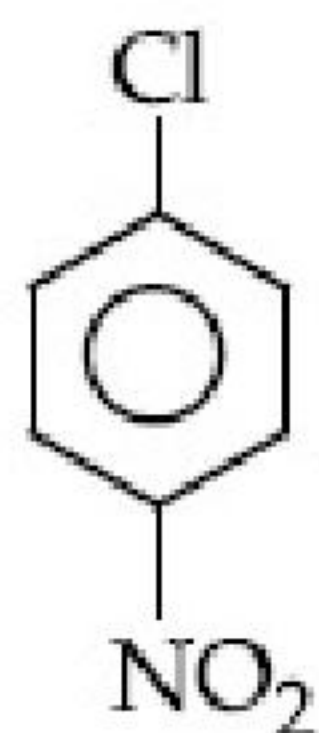


Question Number : 45 Question Id : 70819117448 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

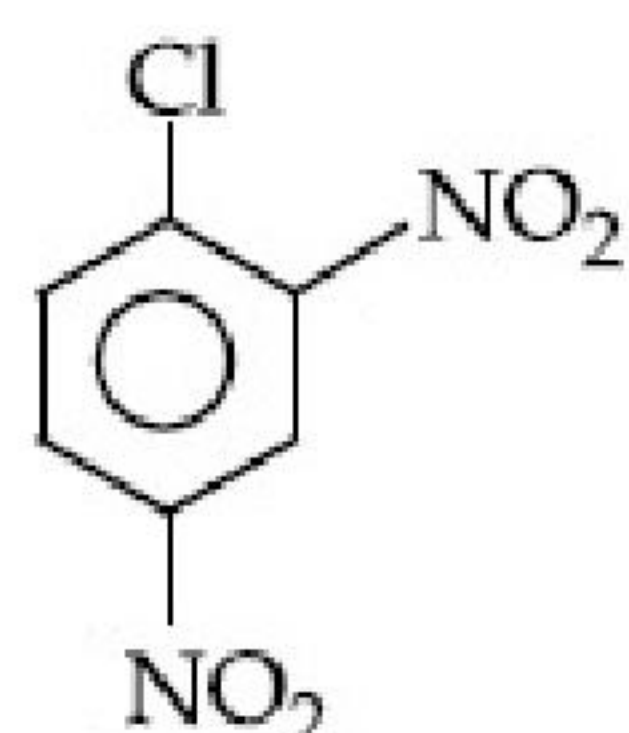
The correct order of the following compounds showing increasing tendency towards nucleophilic substitution reaction is :



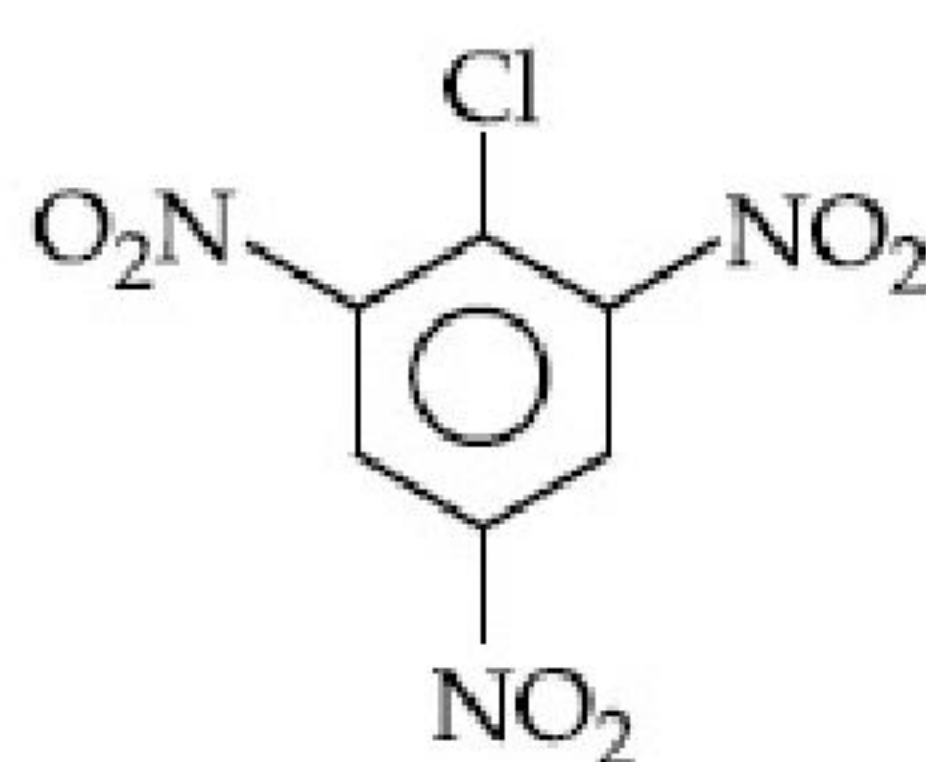
(i)



(ii)



(iii)



(iv)

Options :

70819157507. (iv) < (iii) < (ii) < (i)

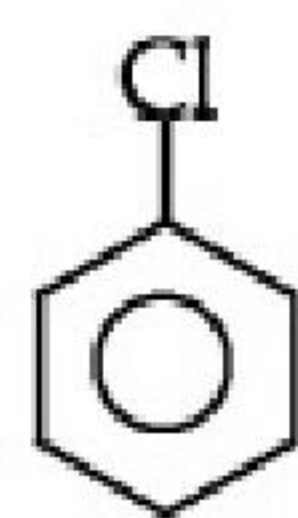
70819157508. (iv) < (i) < (iii) < (ii)

70819157509. (i) < (ii) < (iii) < (iv)

70819157510. (iv) < (i) < (ii) < (iii)

Question Number : 45 Question Id : 70819117448 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

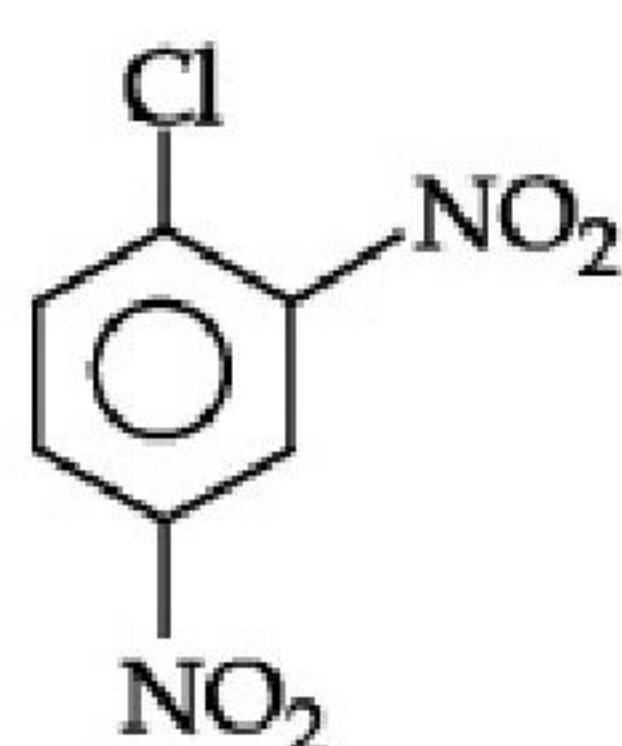
مندرجہ ذیل مرکبات میں نیوکلو فلک متبادل عمل کے رفتار کی بنا پر صحیح درجہ کیا ہے ؟



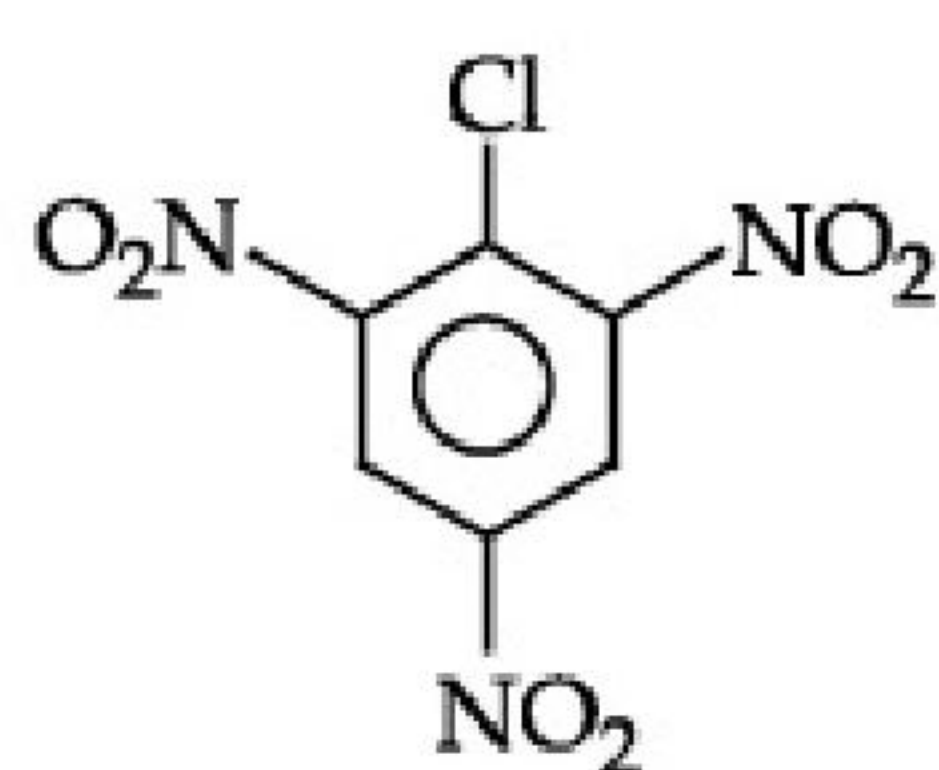
(i)



(ii)



(iii)



(iv)

Options :

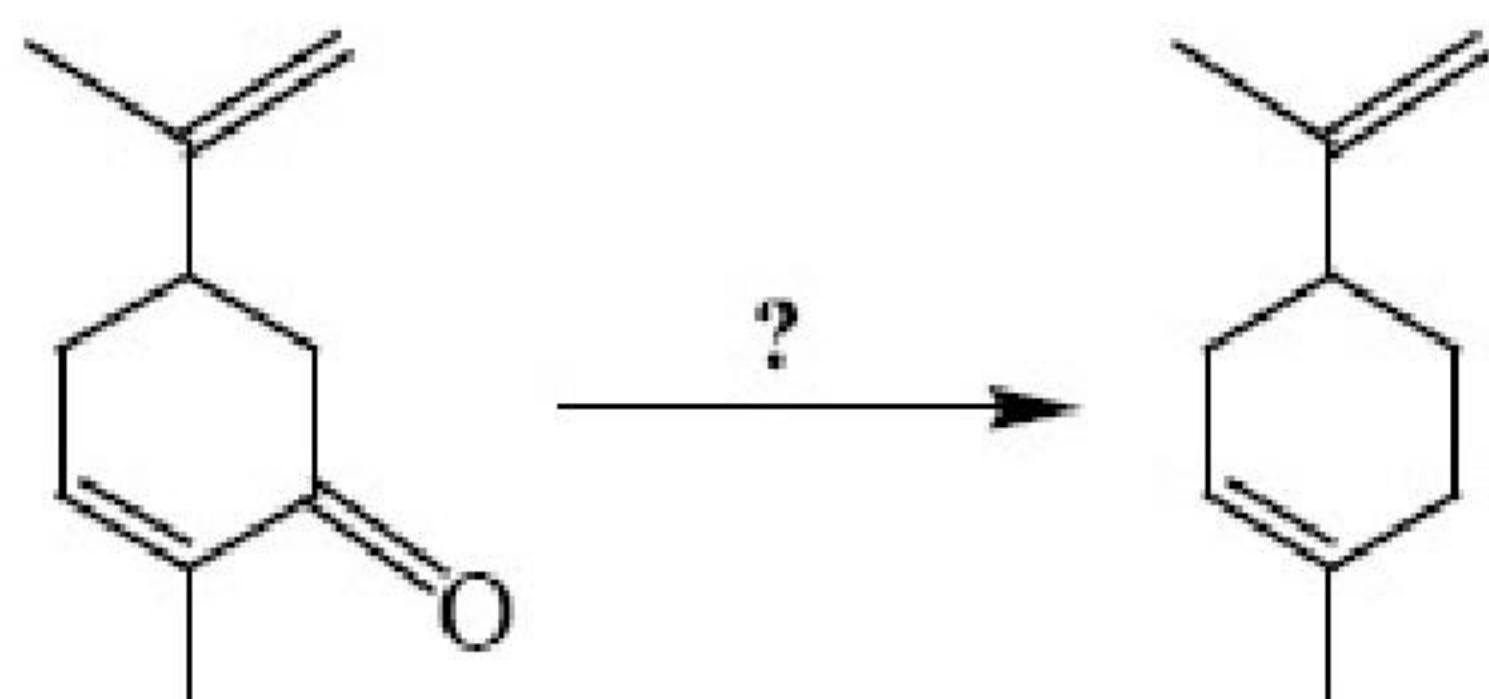
70819157507. (iv) < (iii) < (ii) < (i)

70819157508. (iv) < (i) < (iii) < (ii)

70819157509. (i) < (ii) < (iii) < (iv)

70819157510. (iv) < (i) < (ii) < (iii)

Question Number : 46 Question Id : 70819117449 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1



Which of the following reagent is suitable for the preparation of the product in the above reaction ?

Options :

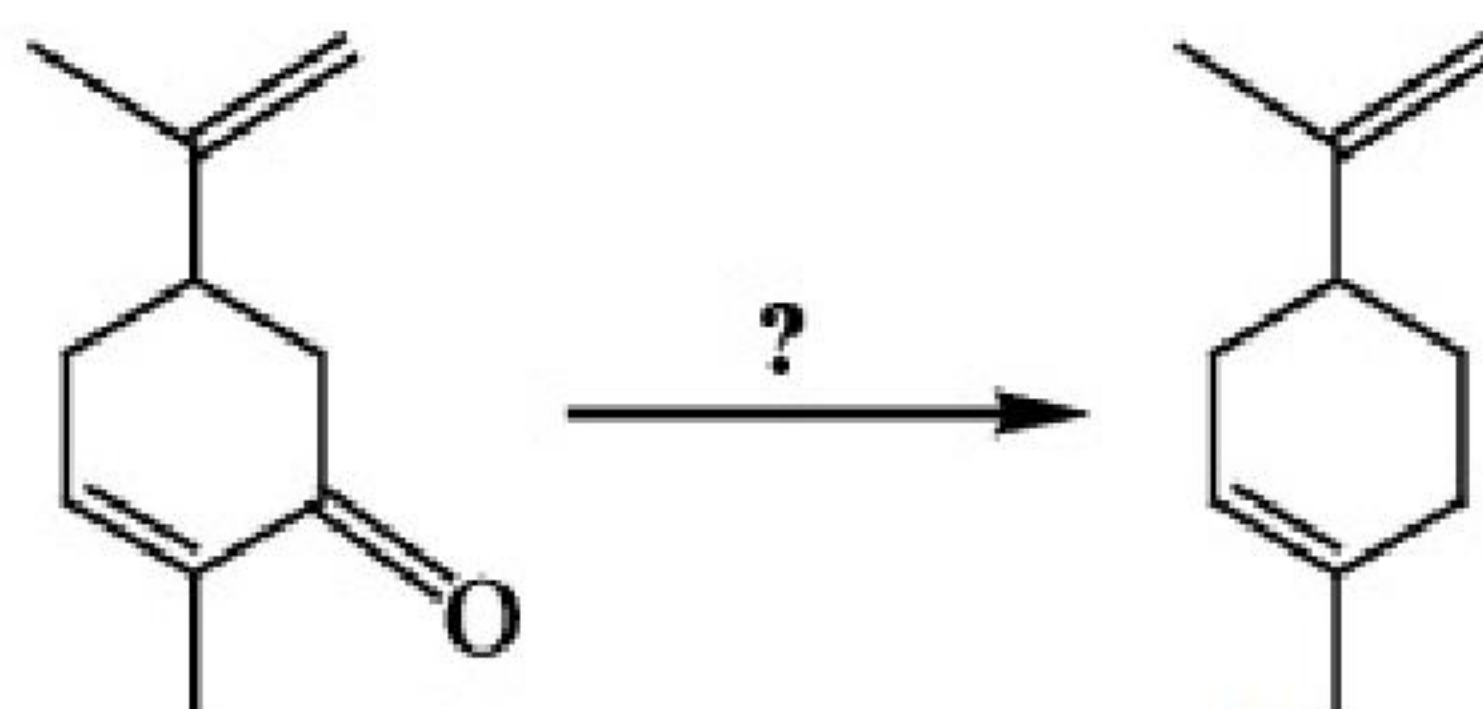
70819157511. NaBH_4

70819157512. $\text{NH}_2-\text{NH}_2/\text{C}_2\text{H}_5\text{O}^\ominus\text{Na}^\oplus$

70819157513. Ni/H_2

70819157514. Red P + Cl_2

Question Number : 46 Question Id : 70819117449 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1



مندرجہ بالا عمل کی تیاری کیلئے مندرجہ ذیل میں سے کونسا متعامل (Reagent) مناسب ہے ؟

Options :

70819157511. NaBH_4

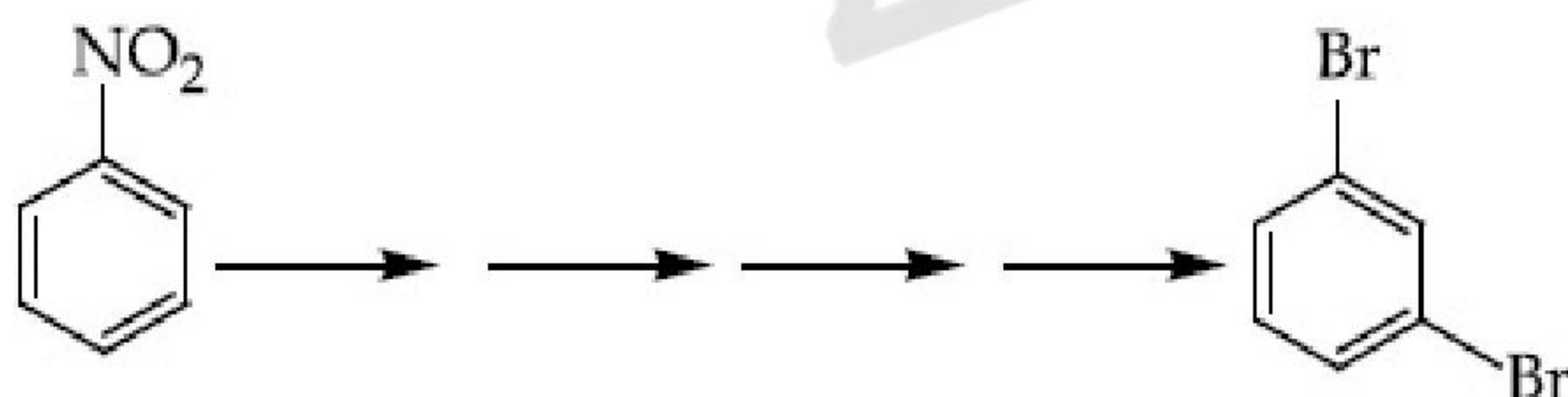
70819157512. $\text{NH}_2-\text{NH}_2/\text{C}_2\text{H}_5\text{O}^\ominus\text{Na}^\oplus$

70819157513. Ni/H_2

70819157514. Red P + Cl_2

Question Number : 47 Question Id : 70819117450 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

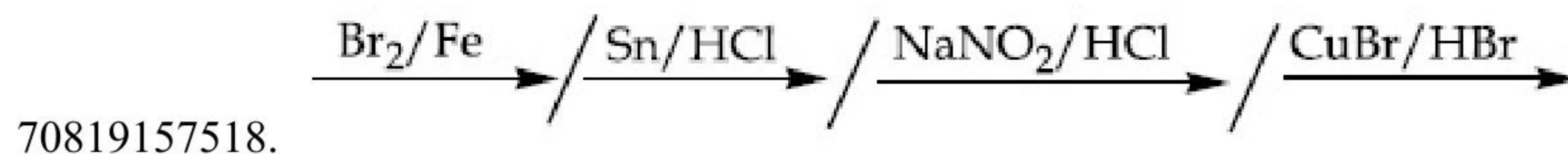
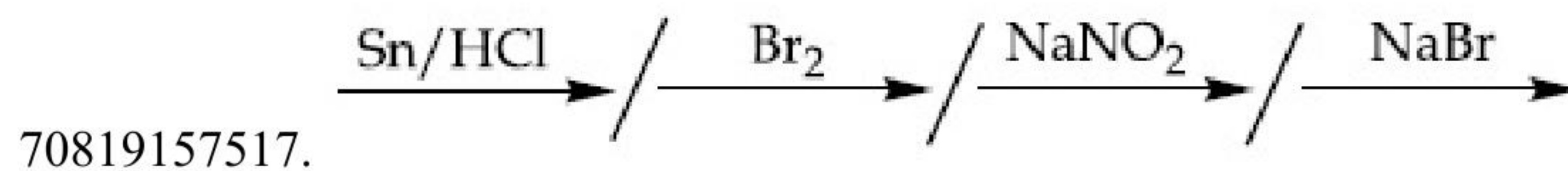
What is the correct sequence of reagents used for converting nitrobenzene into *m*-dibromobenzene ?



Options :

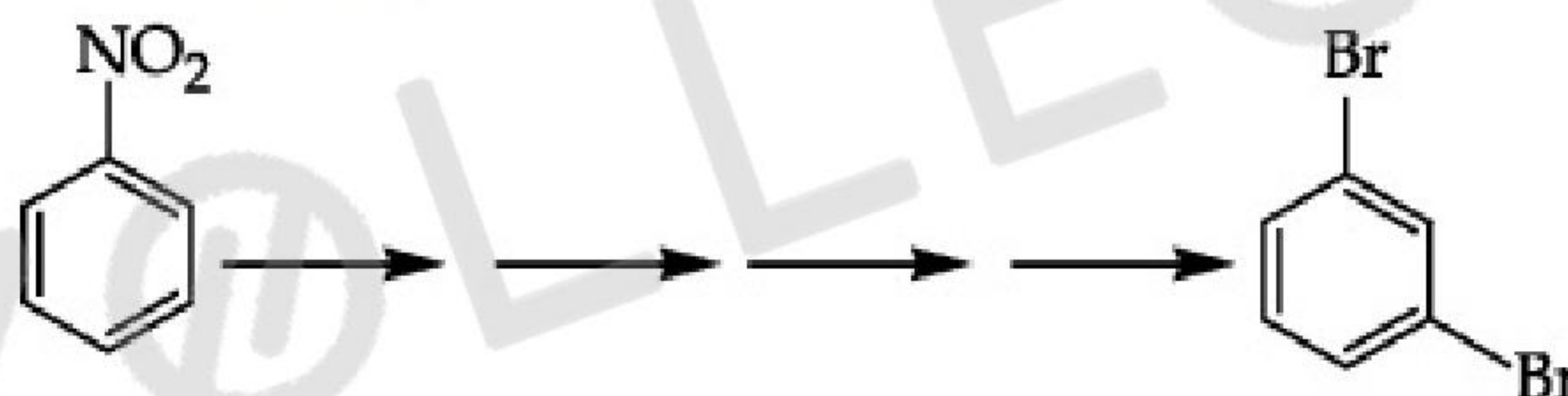
70819157515. $\xrightarrow{\text{Sn}/\text{HCl}}$ $\xrightarrow{\text{KBr}}$ $\xrightarrow{\text{Br}_2}$ $\xrightarrow{\text{H}^+}$

70819157516. $\xrightarrow{\text{NaNO}_2}$ $\xrightarrow{\text{HCl}}$ $\xrightarrow{\text{KBr}}$ $\xrightarrow{\text{H}^+}$

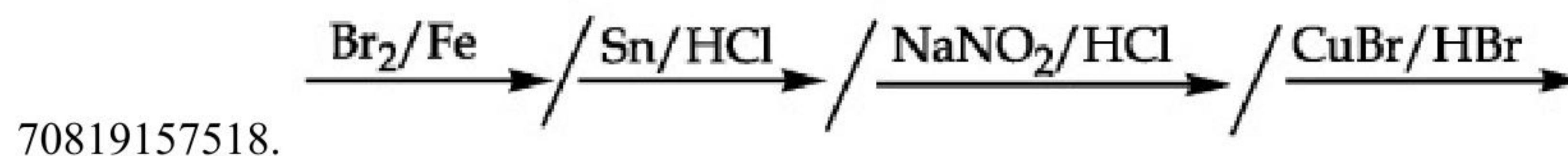
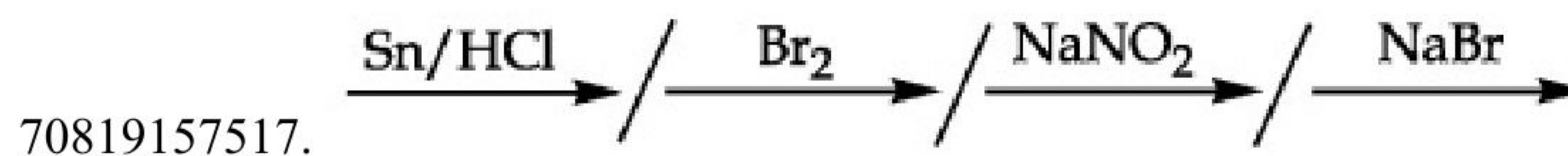
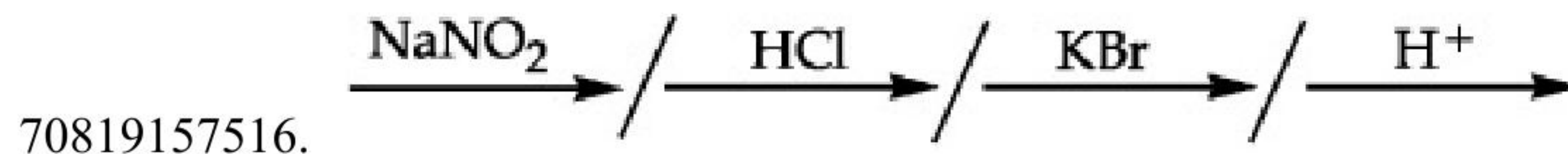


Question Number : 47 Question Id : 70819117450 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

nitrobenzene کی *m*-dibromobenzene میں تبدیل کرنے کے لیے ان میں سے کون سے متعامل کے سلسلے کو استعمال کرتے ہیں ؟



Options :



Question Number : 48 Question Id : 70819117451 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

In polymer Buna-S : 'S' stands for :

Options :

70819157519. Sulphur

70819157520. Strength

70819157521. Styrene

70819157522. Sulphonation

Question Number : 48 Question Id : 70819117451 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Buna-S پولیمر میں 'S' ظاہر کرتا ہے :

Options :

70819157519. Sulphur

70819157520. Strength

70819157521. Styrene

70819157522. Sulphonation

Question Number : 49 Question Id : 70819117452 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match List - I and List - II.

List - I

- (a) Valium
- (b) Morphine
- (c) Norethindrone
- (d) Vitamin B₁₂

List - II

- (i) Antifertility drug
- (ii) Pernicious anaemia
- (iii) Analgesic
- (iv) Tranquilizer

Options :

70819157523. (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)

70819157524. (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

70819157525. (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

70819157526. (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)

Question Number : 49 Question Id : 70819117452 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

فہرست - I اور فہرست - II کا موازنہ کیجئے :

فہرست - II

- (Antifertility drug) دوا برائے رو بار آوری (i)
- (Pernicious anaemia) پریشیسی انیمیا (ii)
- (Analgesic) اینالجیسک (iii)
- (Tranquilizer) سلون پیدا کرنے والا (iv)

فہرست - I

- (Valium) ولیئم (a)
- (Morphine) مورفین (b)
- (Norethindrone) نور-ٹھنڈرون (c)
- (Vitamin B₁₂) ویتامن B₁₂ (d)

Options :

70819157523. (a)-(i), (b)-(iii), (c)-(iv), (d)-(ii)

70819157524. (a)-(iv), (b)-(iii), (c)-(ii), (d)-(i)

70819157525. (a)-(iv), (b)-(iii), (c)-(i), (d)-(ii)

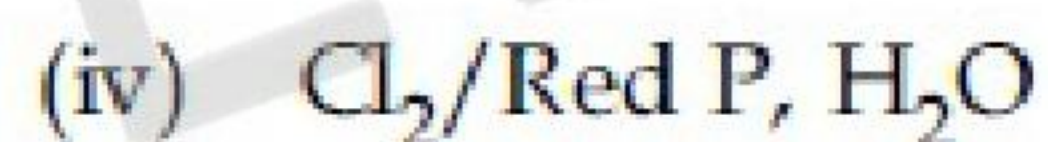
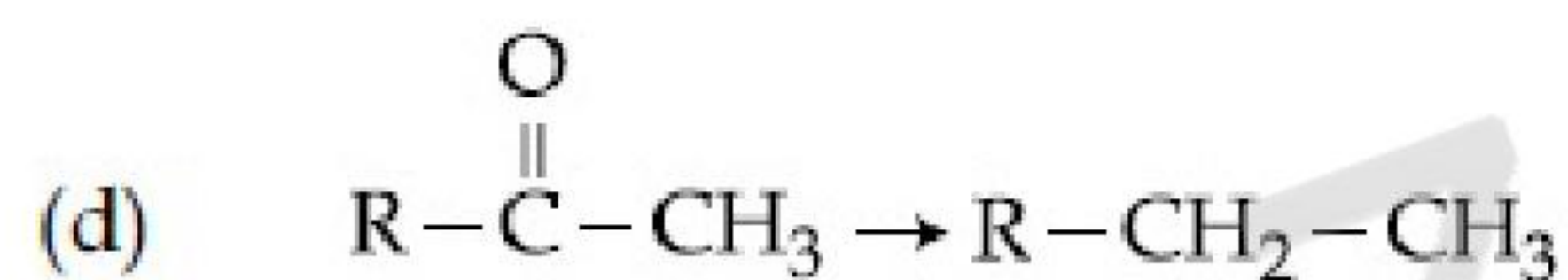
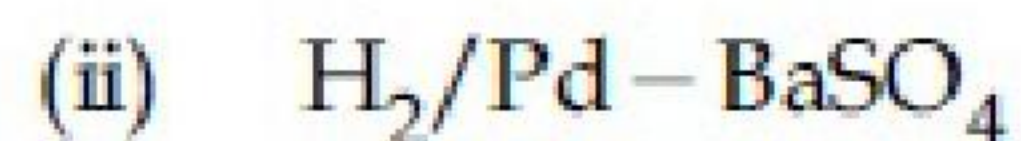
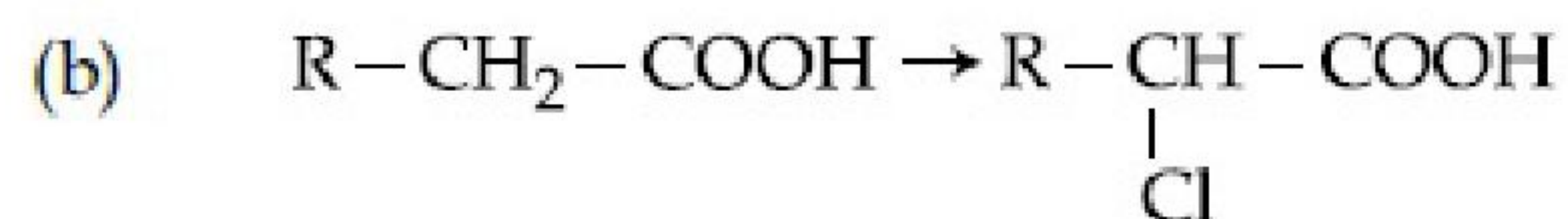
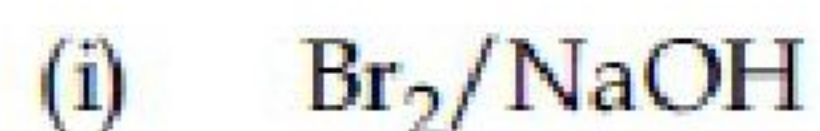
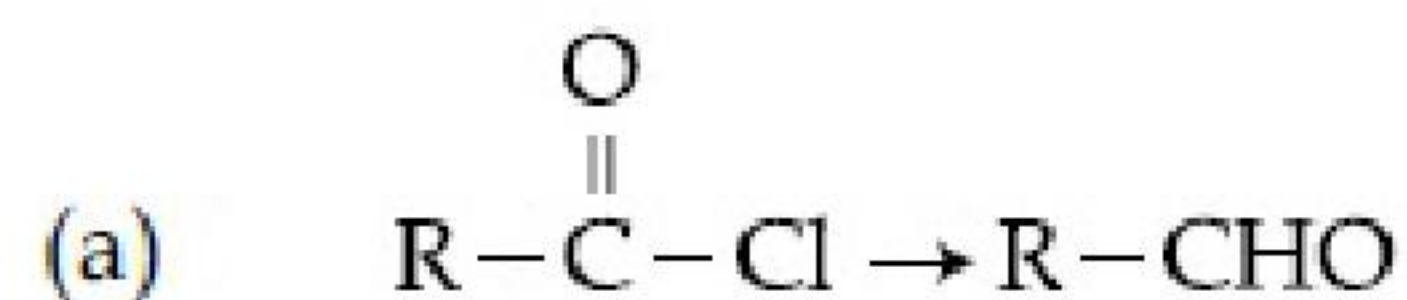
70819157526. (a)-(ii), (b)-(iv), (c)-(iii), (d)-(i)

**Question Number : 50 Question Id : 70819117453 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1**

Match List - I and List - II.

List - I

List - II



Choose the correct answer from the options given below :

Options :

70819157527. (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

70819157528. (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

70819157529. (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

70819157530. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

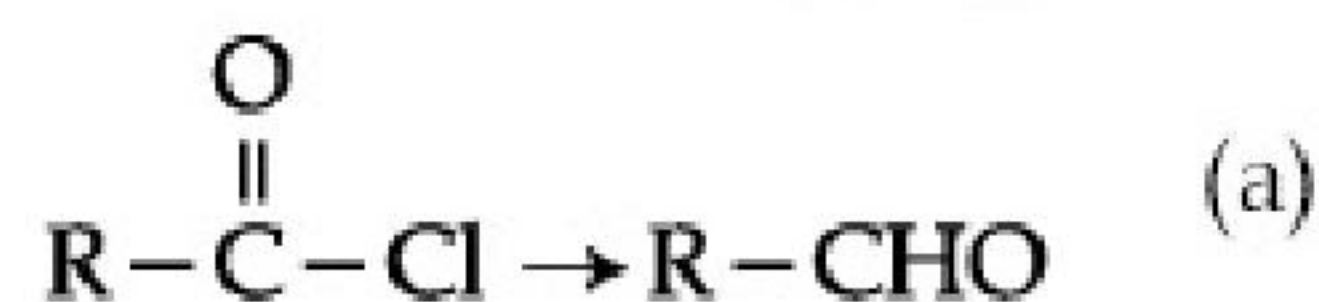
Question Number : 50 Question Id : 70819117453 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

فہرست I اور فہرست II ملائیے :

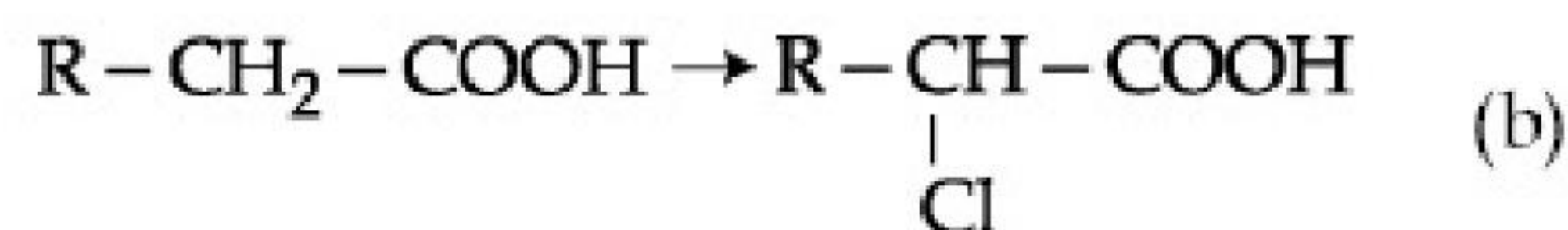
فہرست II

فہرست I

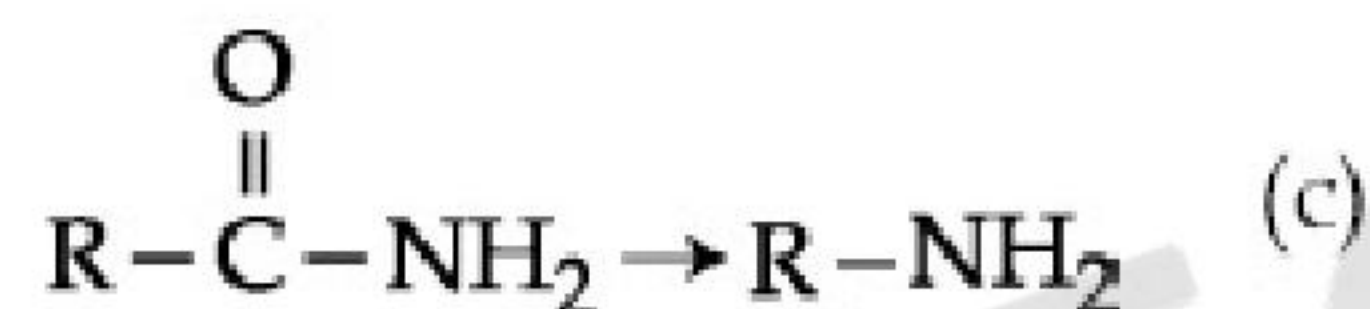
Br₂/NaOH (i)



H₂/Pd - BaSO₄ (ii)



Zn(Hg)/Conc. HCl (iii)



Cl₂/Red P, H₂O (iv)



مندرجہ ذیل میں سے صحیح جواب چن کر لکھئے :

Options :

70819157527. (a)-(iii), (b)-(iv), (c)-(i), (d)-(ii)

70819157528. (a)-(iii), (b)-(i), (c)-(iv), (d)-(ii)

70819157529. (a)-(ii), (b)-(i), (c)-(iv), (d)-(iii)

70819157530. (a)-(ii), (b)-(iv), (c)-(i), (d)-(iii)

Chemistry Section B

Section Id : 708191703
Section Number : 4
Section type : Online
Mandatory or Optional : Mandatory
Number of Questions : 10
Number of Questions to be attempted : 5
Section Marks : 20
Mark As Answered Required? : Yes
Sub-Section Number : 1
Sub-Section Id : 708191983
Question Shuffling Allowed : Yes

Question Number : 51 Question Id : 70819117454 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The formula of a gaseous hydrocarbon which requires 6 times of its own volume of O_2 for complete oxidation and produces 4 times its own volume of CO_2 is C_xH_y . The value of y is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 51 Question Id : 70819117454 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

گیسی حالت میں ہائیڈروکاربن کا ضابطہ جو کہ اپنے حجم سے 6 گنا زیادہ O_2 مکمل نمکسید کے لیے لیتا ہے اور اپنے حجم سے 4 گنا زیادہ CO_2 بناتا ہے C_xH_y کی قیمت _____ ہے۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 52 Question Id : 70819117455 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The volume occupied by 4.75 g of acetylene gas at 50°C and 740 mmHg pressure is _____ L. (Rounded off to the nearest integer)

[Given $R = 0.0826 \text{ L atm K}^{-1} \text{ mol}^{-1}$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 52 Question Id : 70819117455 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

50°C اور 740 mmHg دباؤ پر 4.75 g ایسی ٹلین (acetylene) گیس کا حجم _____ L ہے۔

[دیا گیا : $R = 0.0826 \text{ L atm K}^{-1} \text{ mol}^{-1}$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

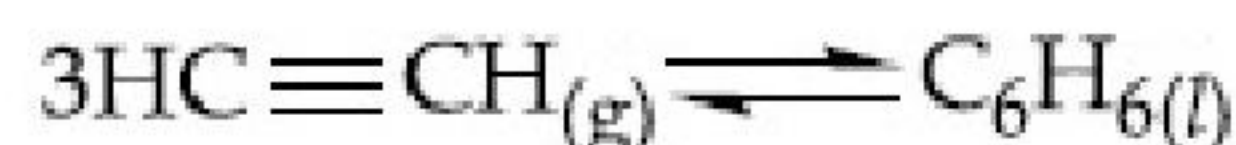
Possible Answers :

5 to 5.001

Question Number : 53 Question Id : 70819117456 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Assuming ideal behaviour, the magnitude of $\log K$ for the following reaction at 25°C is $x \times 10^{-1}$. The value of x is _____. (Integer answer)



[Given : $\Delta_f G^\circ(\text{HC}\equiv\text{CH}) = -2.04 \times 10^5 \text{ J mol}^{-1}$; $\Delta_f G^\circ(\text{C}_6\text{H}_6) = -1.24 \times 10^5 \text{ J mol}^{-1}$; $R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

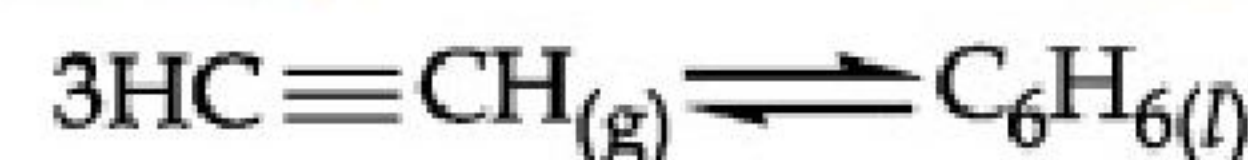
5 to 5.001

Question Number : 53 Question Id : 70819117456 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

25°C پر $x \times 10^{-1}$ مندرجہ ذیل تعامل کی بہت $\log K$ (Magnitude) ہوتی ہے۔ فرض کیجئے کہ مثالی گیس کا برتاؤ مثالی ہے تو x کی

قیمت _____ ہے۔ (جواب عدد میں)



[دیا گیا : $\Delta_f G^\circ(\text{C}_6\text{H}_6) = -1.24 \times 10^5 \text{ J mol}^{-1}$; $\Delta_f G^\circ(\text{HC}\equiv\text{CH}) = -2.04 \times 10^5 \text{ J mol}^{-1}$;

$R = 8.314 \text{ J K}^{-1} \text{ mol}^{-1}$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 54 Question Id : 70819117457 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

C_6H_6 freezes at $5.5^\circ C$. The temperature at which a solution of 10 g of C_4H_{10} in 200 g of C_6H_6 freeze is _____ $^\circ C$. (The molal freezing point depression constant of C_6H_6 is $5.12^\circ C/m$.)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 54 Question Id : 70819117457 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$5.5^\circ C$ پر C_6H_6 منجمد ہوتا ہے۔ 10 گرام C_4H_{10} ، 200 گرام C_6H_6 میں منجمد ہوتا ہے۔ اس کا درجہ حرارت _____
 $^\circ C$ ہے۔ (مولل نقطہ انجماد کی C_6H_6 $5.12^\circ C/m$)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 55 Question Id : 70819117458 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The solubility product of PbI_2 is 8.0×10^{-9} . The solubility of lead iodide in 0.1 molar solution of lead nitrate is $x \times 10^{-6}$ mol/L. The value of x is _____. (Rounded off to the nearest integer)

[Given $\sqrt{2} = 1.41$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 55 Question Id : 70819117458 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

PbI_2 کا حل پذیری کا حاصل 8.0×10^{-9} ہے تو لیڈ نائٹریٹ (lead nitrate solution) میں 0.1 molar لیڈ آئیوڈائیڈ کا حل

پذیری محلول $x \times 10^{-6}$ mol/L ہے۔ x کی قیمت _____ ہے۔

(مکمل عدد میں جواب) [دیا گیا $\sqrt{2} = 1.41$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 56 Question Id : 70819117459 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The magnitude of the change in oxidising power of the $\text{MnO}_4^-/\text{Mn}^{2+}$ couple is $x \times 10^{-4}$ V, if the H^+ concentration is decreased from 1 M to 10^{-4} M at 25°C . (Assume concentration of MnO_4^- and Mn^{2+} to be same on change in H^+ concentration). The value of x is _____. (Rounded off to the nearest integer)

$$\left[\text{Given : } \frac{2.303 RT}{F} = 0.059 \right]$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 56 Question Id : 70819117459 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$\text{MnO}_4^-/\text{Mn}^{2+}$ جوڑی کی تکسیدی طاقت میں تبدیلی کی قیمت $x \times 10^{-4}$ V ہے۔ اگر 25°C پر H^+ کا ارتکاز 1 M سے کم ہو کر 10^{-4} M ہوتا ہے۔ (H^+ کے بدلتے ارتکاز پر MnO_4^- اور Mn^{2+} کے ارتکاز کو یکساں فرض کیجئے) تب x کی قیمت _____

$$\left[\frac{2.303 RT}{F} = 0.059 \text{ : دیا گیا} \right] \text{ ہے۔ (جواب مکمل عدد میں)}$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 57 Question Id : 70819117460 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Sucrose hydrolyses in acid solution into glucose and fructose following first order rate law with a half-life of 3.33 h at 25°C. After 9 h, the fraction of sucrose remaining is f . The value

of $\log_{10}\left(\frac{1}{f}\right)$ is _____ $\times 10^{-2}$. (Rounded off to the nearest integer)

[Assume : $\ln 10 = 2.303$, $\ln 2 = 0.693$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 57 Question Id : 70819117460 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

پہلے درجہ کہ تعامل کے قانون کے مطابق 33 h نصف زندگی کے ساتھ سکروز کی تیزابی ماحول میں آب پائیدگی ہوتی ہے تو گلوکوز اور فروکٹوز حاصل ہوتا ہے۔

9 گھنٹے کے بعد سکروز کا باقی حصہ f ہے۔ $\log_{10}\left(\frac{1}{f}\right)$ کی قیمت $\times 10^{-2}$ ہے۔

(قریب ترین عدد میں)

[فرض کیجئے : $\ln 10 = 2.303$, $\ln 2 = 0.693$]

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 58 Question Id : 70819117461 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Among the following allotropic forms of sulphur, the number of allotropic forms, which will show paramagnetism is _____.

(A) α -sulphur (B) β -sulphur (C) S_2 -form

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 58 Question Id : 70819117461 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

سلفر کی مندرجہ ذیل الوٹروپک اشکال میں سے _____ اسکال پیرامقناطیسیت (Paramagnetism) ظاہر کرتی ہے۔

α -sulphur (A)

β -sulphur (B)

S_2 -form (C)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

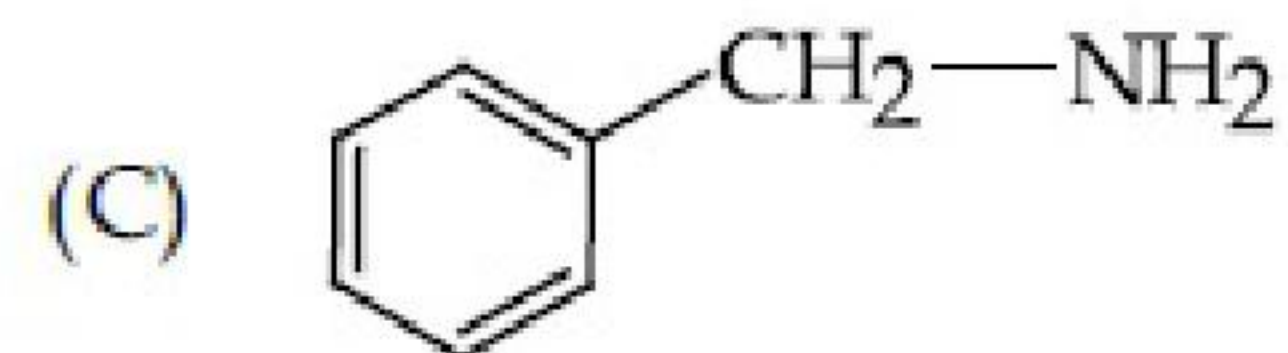
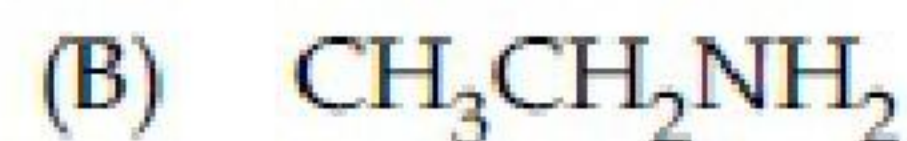
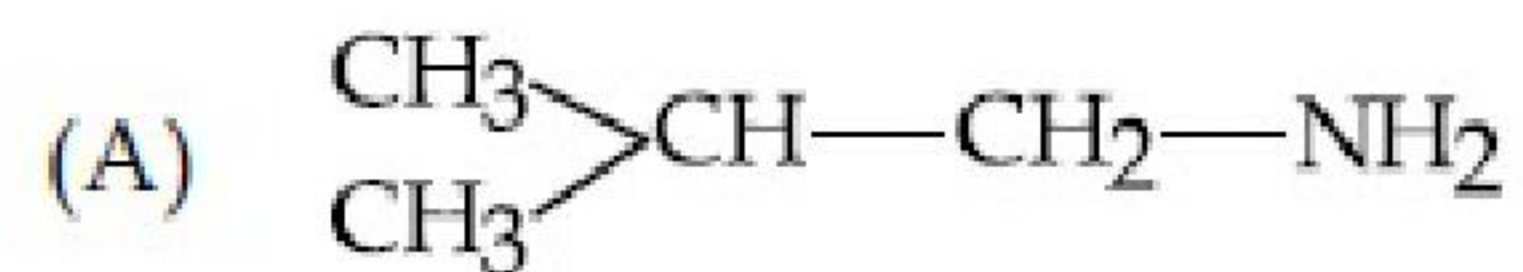
Possible Answers :

5 to 5.001

Question Number : 59 Question Id : 70819117462 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The total number of amines among the following which can be synthesized by Gabriel synthesis is _____.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

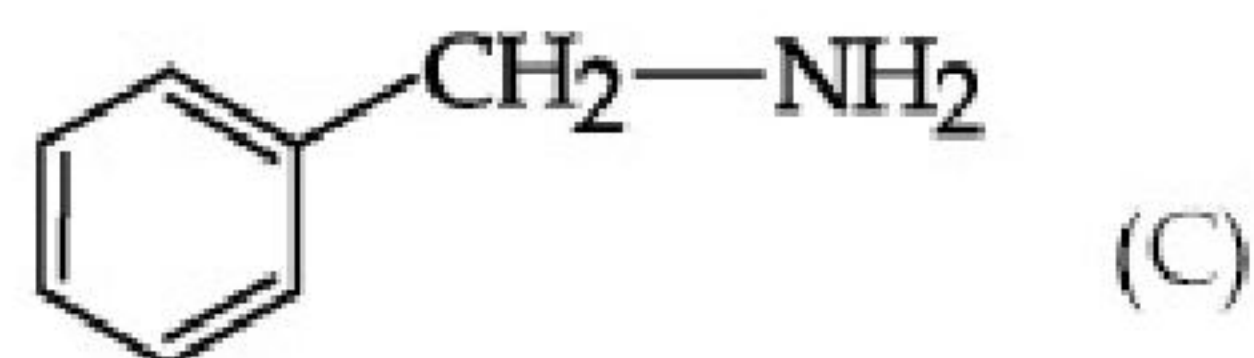
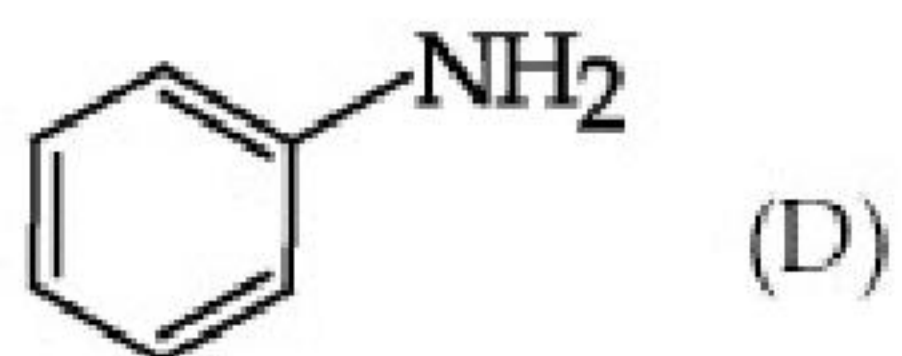
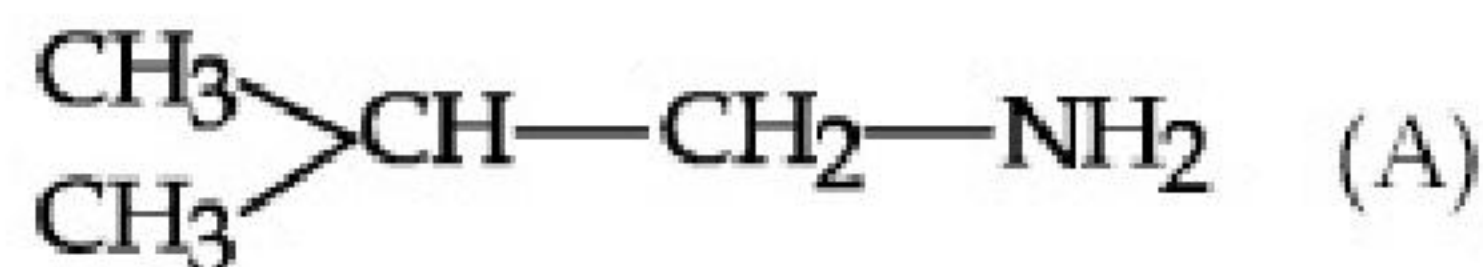
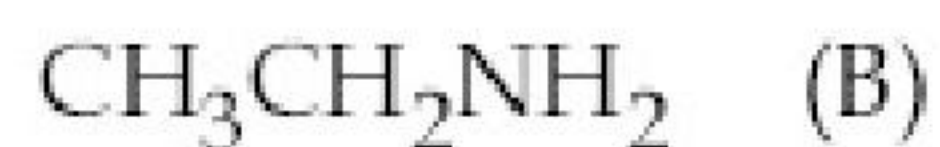
Possible Answers :

5 to 5.001

Question Number : 59 Question Id : 70819117462 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

مندرجہ ذیل امائنس میں سے _____ امائنس گبریل تالیف (Gabriel synthesis) کے ذریعے بنے ہیں۔



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 60 **Question Id :** 70819117463 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

1.86 g of aniline completely reacts to form acetanilide. 10% of the product is lost during purification. Amount of acetanilide obtained after purification (in g) is _____ $\times 10^{-2}$.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 60 **Question Id :** 70819117463 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

1.86 گرام انیلین پوری طرح عمل کر کے acetanilide دیتا ہے۔ خالص کرنے کے عمل (purification) کے دوران 10% حاصل شدہ acetanilide کی مقدار گرام میں $\times 10^{-2}$ ہے۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Mathematics Section A

Section Id :	708191704
Section Number :	5
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	20
Number of Questions to be attempted :	20
Section Marks :	80
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	708191984
Question Shuffling Allowed :	Yes

Question Number : 61 Question Id : 70819117464 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Let $a, b \in \mathbb{R}$. If the mirror image of the point $P(a, 6, 9)$ with respect to the line

$\frac{x-3}{7} = \frac{y-2}{5} = \frac{z-1}{-9}$ is $(20, b, -a-9)$, then $|a+b|$ is equal to :

Options :

70819157541. 84

70819157542. 86

70819157543. 88

70819157544. 90

Question Number : 61 Question Id : 70819117464 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

فرض کیجئے : $a, b \in \mathbb{R}$ ۔ اگر نقطہ $P(a, 6, 9)$ کا خط $\frac{x-3}{7} = \frac{y-2}{5} = \frac{z-1}{-9}$ کے لحاظ سے آئینہ عکس (mirror image) $(20, b, -a-9)$ ہے تو $|a+b|$ کے برابر ہے۔

Options :

70819157541. 84

70819157542. 86

70819157543. 88

70819157544. 90

Question Number : 62 Question Id : 70819117465 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Let a, b, c be in arithmetic progression. Let the centroid of the triangle with vertices $(a, c), (2, b)$ and (a, b) be $\left(\frac{10}{3}, \frac{7}{3}\right)$. If α, β are the roots of the equation $ax^2 + bx + 1 = 0$, then the value of $\alpha^2 + \beta^2 - \alpha\beta$ is :

Options :

70819157545. $-\frac{69}{256}$

70819157546. $-\frac{71}{256}$

$$70819157547. \frac{69}{256}$$

$$70819157548. \frac{71}{256}$$

Question Number : 62 Question Id : 70819117465 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

فرض کیجئے a, b, c حسابی سلسلہ (arithmetic progression) میں ہے۔ فرض کیجئے مثلث جس کے راس $(2, b), (a, c)$ اور (a, b) ہیں اور اس کا وسطی نقطہ (centroid) $\left(\frac{10}{3}, \frac{7}{3}\right)$ ہے۔ اگر α اور β مساوات $ax^2 + bx + 1 = 0$ کے جذر (roots) ہیں تو $\alpha^2 + \beta^2 - \alpha\beta$ کی قیمت _____ ہے۔

Options :

$$70819157545. -\frac{69}{256}$$

$$70819157546. -\frac{71}{256}$$

$$70819157547. \frac{69}{256}$$

$$70819157548. \frac{71}{256}$$

Question Number : 63 Question Id : 70819117466 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

If P is a point on the parabola $y = x^2 + 4$ which is closest to the straight line $y = 4x - 1$, then the co-ordinates of P are :

Options :

70819157549. (3, 13)

70819157550. (2, 8)

70819157551. (-2, 8)

70819157552. (1, 5)

Question Number : 63 Question Id : 70819117466 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

اگر نقطہ P، شیبی $y = x^2 + 4$ پر اس طرح ہے کہ وہ خط $y = 4x - 1$ کے بہت قریب (closest) ہے تو P کے محدد (co-ordinate)

..... ہیں۔

Options :

70819157549. (3, 13)

70819157550. (2, 8)

70819157551. (-2, 8)

70819157552. (1, 5)

Question Number : 64 Question Id : 70819117467 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

For which of the following curves, the line $x + \sqrt{3}y = 2\sqrt{3}$ is the tangent at the point

$$\left(\frac{3\sqrt{3}}{2}, \frac{1}{2}\right) ?$$

Options :

70819157553. $x^2 + y^2 = 7$

70819157554. $x^2 + 9y^2 = 9$

70819157555. $y^2 = \frac{1}{6\sqrt{3}}x$

70819157556. $2x^2 - 18y^2 = 9$

Question Number : 64 Question Id : 70819117467 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

مندرجہ ذیل میں سے کون سے منحنی پر خط $x + \sqrt{3}y = 2\sqrt{3}$ نقطہ $\left(\frac{3\sqrt{3}}{2}, \frac{1}{2}\right)$ پر مماس ہے ؟

Options :

70819157553. $x^2 + y^2 = 7$

70819157554. $x^2 + 9y^2 = 9$

70819157555. $y^2 = \frac{1}{6\sqrt{3}}x$

70819157556. $2x^2 - 18y^2 = 9$

Question Number : 65 Question Id : 70819117468 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The value of the integral, $\int_1^3 [x^2 - 2x - 2]dx$, where $[x]$ denotes the greatest integer less than or equal to x , is :

Options :

70819157557. -5

70819157558. -4

70819157559. $-\sqrt{2} - \sqrt{3} - 1$

70819157560. $-\sqrt{2} - \sqrt{3} + 1$

Question Number : 65 Question Id : 70819117468 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

تکمیل (Integral) $\int_1^3 [x^2 - 2x - 2]dx$ کی قیمت _____ ہے جہاں پر $[x]$ سب سے بڑا صحیح عدد ہے جو x سے چھوٹا یا اس کے برابر ہے۔

Options :

70819157557. -5

70819157558. -4

70819157559. $-\sqrt{2} - \sqrt{3} - 1$

70819157560. $-\sqrt{2} - \sqrt{3} + 1$

Question Number : 66 Question Id : 70819117469 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

The negation of the statement

$\sim p \wedge (p \vee q)$ is :

Options :

70819157561. $\sim p \vee q$

70819157562. $\sim p \wedge q$

70819157563. $p \wedge \sim q$

70819157564. $p \vee \sim q$

Question Number : 66 Question Id : 70819117469 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

بیان $\sim p \wedge (p \vee q)$ کا نفی (negation) _____ ہے۔

Options :

70819157561. $\sim p \vee q$

70819157562. $\sim p \wedge q$

70819157563. $p \wedge \sim q$

70819157564. $p \vee \sim q$

Question Number : 67 Question Id : 70819117470 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Let A and B be 3×3 real matrices such that A is symmetric matrix and B is skew-symmetric matrix. Then the system of linear equations $(A^2B^2 - B^2A^2)X = O$, where X is a 3×1 column matrix of unknown variables and O is a 3×1 null matrix, has :

Options :

70819157565. no solution

70819157566. a unique solution

70819157567. exactly two solutions

70819157568. infinitely many solutions

Question Number : 67 Question Id : 70819117470 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

فرض کیجئے A اور B ، 3×3 حقیقی میٹرکس اس طرح ہیں کہ A تشاگل میٹرکس (Symmetric matrix) اور B خمیدہ تشاگل میٹرکس (skew-symmetric matrix) ہے تو یک درجی مساوات کے نظام $(A^2B^2 - B^2A^2)X = O$ ہو سکتا ہے جہاں پر X نامعلوم متغیر کا 3×1 کالم میٹرکس ہے اور O 3×1 null matrix ہے۔

Options :

70819157565. کوئی بھی حل نہیں (no solution)

70819157566. منفرد حل (a unique solution)

70819157567. صرف دو حل (exactly two solutions)

70819157568. لامحدود حل (infinitely many solutions)

Question Number : 68 Question Id : 70819117471 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Let $f(x)$ be a differentiable function defined on $[0, 2]$ such that $f'(x) = f'(2-x)$ for all

$x \in (0, 2)$, $f(0) = 1$ and $f(2) = e^2$. Then the value of $\int_0^2 f(x) dx$ is :

Options :

70819157569. $1 - e^2$

70819157570. $1 + e^2$

70819157571. $2(1 + e^2)$

70819157572. $2(1 - e^2)$

Question Number : 68 Question Id : 70819117471 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

فرض کیجئے $f(x)$ یہ تفریقی تفاعل (differentiable function) وقفہ $[0, 2]$ میں اس طرح بیان کیا گیا ہے کہ $f'(x) = f'(2 - x)$ سب
کیلئے $x \in (0, 2)$ ، $f(0) = 1$ اور $f(2) = e^2$ تو $\int_0^2 f(x) dx$ کی قیمت _____ ہے۔

Options :

70819157569. $1 - e^2$

70819157570. $1 + e^2$

70819157571. $2(1 + e^2)$

70819157572. $2(1 - e^2)$

Question Number : 69 Question Id : 70819117472 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Let f be a twice differentiable function defined on $\mathbb{R}$ such that $f(0) = 1$, $f'(0) = 2$ and $f'(x) \neq 0$ for all $x \in \mathbb{R}$. If $\begin{vmatrix} f(x) & f'(x) \\ f'(x) & f''(x) \end{vmatrix} = 0$, for all $x \in \mathbb{R}$, then the value of $f(1)$ lies in the interval :

Options :

70819157573. (0, 3)

70819157574. (3, 6)

70819157575. (6, 9)

70819157576. (9, 12)

Question Number : 69 Question Id : 70819117472 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

فرض کیجئے 'f' دو مرتبہ تفریقی تفاعل (differentiable function) ہے جو کہ $\mathbb{R}$ پر اس طرح متعرف ہے کہ $f'(0) = 2$ ، $f(0) = 1$ اور $f'(x) \neq 0$ سب کے لیے $x \in \mathbb{R}$ ۔ اگر سب کیلئے $\begin{vmatrix} f(x) & f'(x) \\ f'(x) & f''(x) \end{vmatrix} = 0$ ، $x \in \mathbb{R}$ تو $f(1)$ کی قیمت _____ وقفہ میں شامل ہے۔

Options :

70819157573. (0, 3)

70819157574. (3, 6)

70819157575. (6, 9)

70819157576. (9, 12)

Question Number : 70 Question Id : 70819117473 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

If the curve $y = ax^2 + bx + c$, $x \in \mathbb{R}$, passes through the point (1, 2) and the tangent line to this curve at origin is $y = x$, then the possible values of a, b, c are :

Options :

70819157577. $a=1, b=1, c=0$

70819157578. $a=1, b=0, c=1$

70819157579. $a=-1, b=1, c=1$

70819157580. $a = \frac{1}{2}, b = \frac{1}{2}, c = 1$

Question Number : 70 Question Id : 70819117473 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

اگر منحنی $y = ax^2 + bx + c$ (curve) $x \in \mathbb{R}$ نقطہ (1, 2) میں سے گزرتی ہے اور اس منحنی کے اوپر مبدأ پر خط مماس (tangent line) کی مساوات $y = x$ ہے تو a, b, c کے ممکنہ قیمتیں _____ ہیں۔

Options :

70819157577. $a=1, b=1, c=0$

70819157578. $a = 1, b = 0, c = 1$

70819157579. $a = -1, b = 1, c = 1$

70819157580. $a = \frac{1}{2}, b = \frac{1}{2}, c = 1$

Question Number : 71 Question Id : 70819117474 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

If $n \geq 2$ is a positive integer, then the sum of the series

${}^{n+1}C_2 + 2({}^2C_2 + {}^3C_2 + {}^4C_2 + \dots + {}^nC_2)$ is :

Options :

70819157581. $\frac{n(n-1)(2n+1)}{6}$

70819157582. $\frac{n(n+1)(2n+1)}{6}$

70819157583. $\frac{n(2n+1)(3n+1)}{6}$

70819157584. $\frac{n(n+1)^2(n+2)}{12}$

Question Number : 71 Question Id : 70819117474 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

اگر $n \geq 2$ ایک مثبت حقیقی عدد ہے تو ${}^{n+1}C_2 + 2({}^2C_2 + {}^3C_2 + {}^4C_2 + \dots + {}^nC_2)$ مربوط تسلسل (series) کا مجموعہ _____ ہے۔

Options :

70819157581. $\frac{n(n-1)(2n+1)}{6}$

70819157582. $\frac{n(n+1)(2n+1)}{6}$

70819157583. $\frac{n(2n+1)(3n+1)}{6}$

70819157584. $\frac{n(n+1)^2(n+2)}{12}$

Question Number : 72 Question Id : 70819117475 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

For the system of linear equations :

$$x - 2y = 1, x - y + kz = -2, ky + 4z = 6, k \in \mathbb{R},$$

consider the following statements :

- (A) The system has unique solution if $k \neq 2, k \neq -2$.
- (B) The system has unique solution if $k = -2$.
- (C) The system has unique solution if $k = 2$.
- (D) The system has no-solution if $k = 2$.
- (E) The system has infinite number of solutions if $k \neq -2$.

Which of the following statements are correct ?

Options :

70819157585. (A) and (D) only

70819157586. (A) and (E) only

70819157587. (C) and (D) only

70819157588. (B) and (E) only

Question Number : 72 Question Id : 70819117475 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

خطی مساوات نظام کے لئے :

$$k \in \mathbf{R}, ky + 4z = 6, x - y + kz = -2, x - 2y = 1$$

درج ذیل بیانات پر غور کریں :

(A) نظام میں منفرد حل ہے اگر $k \neq -2, k \neq 2$

(B) نظام میں منفرد حل ہے اگر $k = -2$

(C) نظام میں منفرد حل ہے اگر $k = 2$

(D) نظام میں کوئی حل نہیں ہے اگر $k = 2$

(E) نظام میں لامحدود حل ہیں اگر $k \neq -2$

درج ذیل میں سے کون سے بیانات صحیح ہیں ؟

Options :

70819157585. (A) اور (D) صرف

70819157586. (A) اور (E) صرف

70819157587. (C) اور (D) صرف

70819157588. (B) اور (E) صرف

Question Number : 73 Question Id : 70819117476 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be defined as

$$f(x) = \begin{cases} -55x, & \text{if } x < -5 \\ 2x^3 - 3x^2 - 120x, & \text{if } -5 \leq x \leq 4 \\ 2x^3 - 3x^2 - 36x - 336, & \text{if } x > 4, \end{cases}$$

Let $A = \{x \in \mathbb{R} : f \text{ is increasing}\}$. Then A is equal to :

Options :

70819157589. $(-\infty, -5) \cup (4, \infty)$

70819157590. $(-5, -4) \cup (4, \infty)$

70819157591. $(-\infty, -5) \cup (-4, \infty)$

70819157592. $(-5, \infty)$

Question Number : 73 Question Id : 70819117476 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

فرض کیجئے : $f: \mathbb{R} \rightarrow \mathbb{R}$ اس طرح بیان کیا گیا ہے

$$f(x) = \begin{cases} -55x, & \text{if } x < -5 \\ 2x^3 - 3x^2 - 120x, & \text{if } -5 \leq x \leq 4 \\ 2x^3 - 3x^2 - 36x - 336, & \text{if } x > 4. \end{cases}$$

فرض کیجئے {بڑھتے ہوئے f کے لئے} $A = \{x \in \mathbb{R} : \dots\}$ تو A مساوی ہے :

Options :

70819157589. $(-\infty, -5) \cup (4, \infty)$

70819157590. $(-5, -4) \cup (4, \infty)$

70819157591. $(-\infty, -5) \cup (-4, \infty)$

70819157592. $(-5, \infty)$

Question Number : 74 Question Id : 70819117477 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

A possible value of $\tan\left(\frac{1}{4}\sin^{-1}\frac{\sqrt{63}}{8}\right)$ is :

Options :

70819157593. $\frac{1}{\sqrt{7}}$

70819157594. $\frac{1}{2\sqrt{2}}$

70819157595. $\sqrt{7} - 1$

70819157596. $2\sqrt{2} - 1$

Question Number : 74 Question Id : 70819117477 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

_____ کے ممکنہ قیمت $\tan\left(\frac{1}{4}\sin^{-1}\frac{\sqrt{63}}{8}\right)$ (possible value)

Options :

70819157593. $\frac{1}{\sqrt{7}}$

70819157594. $\frac{1}{2\sqrt{2}}$

70819157595. $\sqrt{7} - 1$

70819157596. $2\sqrt{2} - 1$

Question Number : 75 Question Id : 70819117478 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The angle of elevation of a jet plane from a point A on the ground is 60° . After a flight of 20 seconds at the speed of 432 km/hour, the angle of elevation changes to 30° . If the jet plane is flying at a constant height, then its height is :

Options :

70819157597. $3600\sqrt{3}$ m

70819157598. $2400\sqrt{3}$ m

70819157599. $1800\sqrt{3}$ m

70819157600. $1200\sqrt{3}$ m

Question Number : 75 Question Id : 70819117478 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

جیٹ جہاز (jet plane) سے زمین (ground) پر ایک نقطہ A کے ساتھ 60° کا صعودی زاویہ (angle of elevation) بنتا ہے۔ 20 سیکنڈ میں 432 km/hour کی رفتار سے اڑنے کے بعد صعودی زاویہ میں 30° کا فرق ہوتا ہے۔ اگر جیٹ جہاز ایک مستقل اونچائی (constant height) پر اڑ رہا ہے تو اس کی اونچائی _____ ہے۔

Options :

70819157597. $3600\sqrt{3}$ m

70819157598. $2400\sqrt{3}$ m

70819157599. $1800\sqrt{3}$ m

70819157600. $1200\sqrt{3} \text{ m}$

Question Number : 76 Question Id : 70819117479 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The vector equation of the plane passing through the intersection of the planes

$\vec{r} \cdot (\hat{i} + \hat{j} + \hat{k}) = 1$ and $\vec{r} \cdot (\hat{i} - 2\hat{j}) = -2$, and the point (1, 0, 2) is :

Options :

70819157601. $\vec{r} \cdot (3\hat{i} + 7\hat{j} + 3\hat{k}) = 7$

70819157602. $\vec{r} \cdot (\hat{i} + 7\hat{j} + 3\hat{k}) = 7$

70819157603. $\vec{r} \cdot (\hat{i} - 7\hat{j} + 3\hat{k}) = \frac{7}{3}$

70819157604. $\vec{r} \cdot (\hat{i} + 7\hat{j} + 3\hat{k}) = \frac{7}{3}$

Question Number : 76 Question Id : 70819117479 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

مستوی کی سمتی مساوات (vector equation) _____ ہے جو مستویوں $\vec{r} \cdot (\hat{i} + \hat{j} + \hat{k}) = 1$ اور

$\vec{r} \cdot (\hat{i} - 2\hat{j}) = -2$ کے انقطاع (intersection) میں سے اور نقطہ (1, 0, 2) میں سے گذرتی ہے۔

Options :

70819157601. $\vec{r} \cdot (3\hat{i} + 7\hat{j} + 3\hat{k}) = 7$

70819157602. $\vec{r} \cdot (\hat{i} + 7\hat{j} + 3\hat{k}) = 7$

70819157603. $\vec{r} \cdot (\hat{i} - 7\hat{j} + 3\hat{k}) = \frac{7}{3}$

70819157604. $\vec{r} \cdot (\hat{i} + 7\hat{j} + 3\hat{k}) = \frac{7}{3}$

Question Number : 77 Question Id : 70819117480 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

For the statements p and q, consider the following compound statements :

(a) $(\sim q \wedge (p \rightarrow q)) \rightarrow \sim p$

(b) $((p \vee q) \wedge \sim p) \rightarrow q$

Then which of the following statements is correct ?

Options :

70819157605. (a) is a tautology but not (b).

70819157606. (b) is a tautology but not (a).

70819157607. (a) and (b) both are tautologies.

70819157608. (a) and (b) both are not tautologies.

Question Number : 77 Question Id : 70819117480 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

بیانات p اور q کے مندرجہ ذیل مرکب بیانات فرض کیجئے :

$$(\sim q \wedge (p \rightarrow q)) \rightarrow \sim p \quad (a)$$

$$((p \vee q) \wedge \sim p) \rightarrow q \quad (b)$$

تو مندرجہ ذیل میں سے کون سے بیانات صحیح ہے ؟

Options :

70819157605. (a) بامعنی (tautology) ہے لیکن (b) نہیں

70819157606. (b) بامعنی ہے لیکن (a) نہیں۔

70819157607. (a) اور (b) دونوں بامعنی ہیں۔

70819157608. (a) اور (b) دونوں بامعنی نہیں ہیں۔

Question Number : 78 Question Id : 70819117481 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

If a curve $y=f(x)$ passes through the point (1, 2) and satisfies $x \frac{dy}{dx} + y = bx^4$, then for

what value of b, $\int_1^2 f(x)dx = \frac{62}{5}$?

Options :

70819157609. 10

70819157610. $\frac{31}{5}$

70819157611. 5

70819157612. $\frac{62}{5}$

Question Number : 78 Question Id : 70819117481 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

اگر منحنی $y=f(x)$ (curve) نقطہ $(1, 2)$ میں سے گذرتی ہے اور $x \frac{dy}{dx} + y = bx^4$ کو مطمئن کرتی ہے تو b کی کس قیمت پر

$$\int_1^2 f(x) dx = \frac{62}{5} \text{ ہوگا؟}$$

Options :

70819157609. 10

70819157610. $\frac{31}{5}$

70819157611. 5

70819157612. $\frac{62}{5}$

Question Number : 79 Question Id : 70819117482 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

The probability that two randomly selected subsets of the set {1, 2, 3, 4, 5} have exactly two elements in their intersection, is :

Options :

70819157613. $\frac{65}{2^7}$

70819157614. $\frac{65}{2^8}$

70819157615. $\frac{135}{2^9}$

70819157616. $\frac{35}{2^7}$

Question Number : 79 Question Id : 70819117482 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No
Correct Marks : 4 Wrong Marks : 1

سیٹ {1, 2, 3, 4, 5} میں سے بغیر سوچے سمجھے دو ضمنی سیٹ (subsets) اس طرح منتخب کئے گئے کہ ان کے تقاطع (intersection) میں صرف دو رکن (elements) ہوں۔ اس کا احتمال _____ ہے۔

Options :

70819157613. $\frac{65}{2^7}$

70819157614. $\frac{65}{2^8}$

70819157615. $\frac{135}{2^9}$

70819157616. $\frac{35}{2^7}$

Question Number : 80 Question Id : 70819117483 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

The area of the region : $R = \{(x, y) : 5x^2 \leq y \leq 2x^2 + 9\}$ is :

Options :

70819157617. $6\sqrt{3}$ square units

70819157618. $9\sqrt{3}$ square units

70819157619. $11\sqrt{3}$ square units

70819157620. $12\sqrt{3}$ square units

Question Number : 80 Question Id : 70819117483 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No Correct Marks : 4 Wrong Marks : 1

$$R = \{(x, y) : 5x^2 \leq y \leq 2x^2 + 9\}$$

علاقہ (region) کا رقبہ (area) _____ ہے۔

Options :

70819157617. $6\sqrt{3}$ مربع اکائی

70819157618. $9\sqrt{3}$ مربع اکائی

70819157619. $11\sqrt{3}$ مربع اکائی

70819157620. $12\sqrt{3}$ مربع اکائی

Mathematics Section B

Section Id :	708191705
Section Number :	6
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	708191985
Question Shuffling Allowed :	Yes

Question Number : 81 Question Id : 70819117484 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If the variance of 10 natural numbers $1, 1, 1, \dots, 1, k$ is less than 10, then the maximum possible value of k is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 81 Question Id : 70819117484 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

اگر دس قدرتی نمبرات $1, 1, 1, \dots, 1, k$ (natural numbers) کا تغیر (variance) 10 سے کم ہے تو k کی زیادہ سے زیادہ ممکن قیمت (maximum possible value) _____ ہے۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 82 Question Id : 70819117485 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let a point P be such that its distance from the point $(5, 0)$ is thrice the distance of P from the point $(-5, 0)$. If the locus of the point P is a circle of radius r , then $4r^2$ is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 82 Question Id : 70819117485 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

فرض کیجئے ایک نقطہ P اس طرح ہے کہ نقطہ $(5, 0)$ سے اس کا فاصلہ (distance) نقطہ $(-5, 0)$ سے اس کے فاصلے کے تین گنا (thrice) ہے۔ اگر نقطہ P کے locus کی مساوات دائرہ جس کا نصف قطر r ہے تو $4r^2$ کے برابر ہے۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 83 Question Id : 70819117486 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If the area of the triangle formed by the positive x -axis, the normal and the tangent to the circle $(x-2)^2 + (y-3)^2 = 25$ at the point $(5, 7)$ is A, then $24A$ is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 83 Question Id : 70819117486 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

اگر x محور، دائرہ $(x-2)^2 + (y-3)^2 = 25$ پر نقطہ $(5, 7)$ پر (normal) نارمل اور مماس سے بننے والے مثلث کا رقبہ A ہو تو

24 A کے برابر ہے۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 84 Question Id : 70819117487 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let $i = \sqrt{-1}$. If $\frac{(-1 + i\sqrt{3})^{21}}{(1 - i)^{24}} + \frac{(1 + i\sqrt{3})^{21}}{(1 + i)^{24}} = k$, and $n = [|k|]$ be the greatest integral part

of $|k|$. Then $\sum_{j=0}^{n+5} (j+5)^2 - \sum_{j=0}^{n+5} (j+5)$ is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 84 Question Id : 70819117487 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

فرض کیجئے $i = \sqrt{-1}$

اگر $\frac{(-1 + i\sqrt{3})^{21}}{(1 - i)^{24}} + \frac{(1 + i\sqrt{3})^{21}}{(1 + i)^{24}} = k$ اور $n = [|k|]$ کا سب سے بڑا انکیلی حصہ (the greatest integral part) ہے تو _____ کے برابر ہے۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 85 Question Id : 70819117488 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The students $S_1, S_2, \dots, S_{10}$ are to be divided into 3 groups A, B and C such that each group has at least one student and the group C has at most 3 students. Then the total number of possibilities of forming such groups is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 85 Question Id : 70819117488 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

دس طالبات $S_1, S_2, \dots, S_{10}$ (students) کو تین جماعتوں A, B, C (groups) میں اس طرح تقسیم کیا گیا کہ ہر ایک جماعت میں کم سے کم ایک (at least one) طالب علم اور جماعت C میں زیادہ سے زیادہ تین (at most three) طالب علم ہوں۔ ایسی جماعت بنانے کی ممکن کل تعداد _____ ہے۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 86 **Question Id :** 70819117489 **Question Type :** SA

Correct Marks : 4 **Wrong Marks :** 0

For integers n and r , let $\binom{n}{r} = \begin{cases} nC_r, & \text{if } n \geq r \geq 0 \\ 0, & \text{otherwise} \end{cases}$

The maximum value of k for which the sum

$\sum_{i=0}^k \binom{10}{i} \binom{15}{k-i} + \sum_{i=0}^{k+1} \binom{12}{i} \binom{13}{k+1-i}$ exists, is equal to _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 86 Question Id : 70819117489 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

n اور r حقیقی اعداد کے لئے

$$\binom{n}{r} = \begin{cases} {}^nC_r, & \text{if } n \geq r \geq 0 \\ 0, & \text{اس کے علاوہ} \end{cases} \quad \text{فرض کیجئے}$$

k کی زیادہ سے زیادہ قیمت جس کے لئے مجموعہ

$$\sum_{i=0}^k \binom{10}{i} \binom{15}{k-i} + \sum_{i=0}^{k+1} \binom{12}{i} \binom{13}{k+1-i}$$

موجود ہے۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 87 Question Id : 70819117490 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If $a + \alpha = 1$, $b + \beta = 2$ and $af(x) + \alpha f\left(\frac{1}{x}\right) = bx + \frac{\beta}{x}$, $x \neq 0$, then the value of the expression

$$\frac{f(x) + f\left(\frac{1}{x}\right)}{x + \frac{1}{x}} \text{ is } \underline{\hspace{2cm}}.$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 87 Question Id : 70819117490 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$$af(x) + \alpha f\left(\frac{1}{x}\right) = bx + \frac{\beta}{x}, x \neq 0 \text{ اور } b + \beta = 2, a + \alpha = 1$$

تو مجموعہ (expression) کی قیمت _____ ہے۔

$$\frac{f(x) + f\left(\frac{1}{x}\right)}{x + \frac{1}{x}}$$

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 88 Question Id : 70819117491 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let λ be an integer. If the shortest distance between the lines $x - \lambda = 2y - 1 = -2z$ and

$x = y + 2\lambda = z - \lambda$ is $\frac{\sqrt{7}}{2\sqrt{2}}$, then the value of $|\lambda|$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 88 Question Id : 70819117491 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

فرض کیجئے λ صحیح عدد ہے۔ اگر خطوط $x = y + 2\lambda = z - \lambda$ اور $x - \lambda = 2y - 1 = -2z$ کے درمیان کا مختصر فاصلہ (shortest distance) ہے تو $|\lambda|$ کی قیمت _____ ہے۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 89 Question Id : 70819117492 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The sum of first four terms of a geometric progression (G.P.) is $\frac{65}{12}$ and the sum of their respective reciprocals is $\frac{65}{18}$. If the product of first three terms of the G.P. is 1, and the third term is α , then 2α is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 89 Question Id : 70819117492 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ہندسی سلسلہ (geometric progression) کے پہلے چار ارکان (terms) کا مجموعہ (sum) $\frac{65}{12}$ ہے۔ اور ان کے بالترتیب معکوس کا

مجموعہ $\frac{65}{18}$ ہے۔ اگر G.P. کے پہلے تین ارکان کا حاصل ضرب (product) 1 ہے اور تیسرا رکن α (third term) ہے تو 2α

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 90 Question Id : 70819117493 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The number of the real roots of the equation $(x+1)^2 + |x-5| = \frac{27}{4}$ is _____.

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 90 Question Id : 70819117493 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

مسوات $(x+1)^2 + |x-5| = \frac{27}{4}$ کے حقیقی جذر (real roots) کی تعداد _____ ہے۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

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