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Question Paper Name :	B TECH EU 26th Feb 2021 Shift 1
Subject Name :	B TECH EU
Creation Date :	2021-02-25 11:54:05
Duration :	180
Number of Questions :	90
Total Marks :	300
Display Marks:	Yes

B TECH EU

Group Number :	1
Group Id :	708191227
Group Maximum Duration :	0
Group Minimum Duration :	180
Show Attended Group? :	No
Edit Attended Group? :	No
Break time :	0
Group Marks :	300
Is this Group for Examiner? :	No

Physics Section A

Section Id :	708191940
Section Number :	1
Section type :	Online

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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 : 7081911220

Question Shuffling Allowed : Yes

Question Number : 1 Question Id : 70819121004 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In a typical combustion engine the workdone by a gas molecule is given by $W = \alpha^2 \beta e^{\frac{-\beta x^2}{kT}}$, where x is the displacement, k is the Boltzmann constant and T is the temperature. If α and β are constants, dimensions of α will be :

Options :

70819168161. $[M L T^{-2}]$

70819168162. $[M^0 L T^0]$

70819168163. $[M L T^{-1}]$

70819168164. $[M^2 L T^{-2}]$

Question Number : 1 Question Id : 70819121004 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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ایک مثالی ایندھنی انجن کے لیے گیس کے کام کرنے کی مساوات $W = \alpha^2 \beta e^{\frac{-\beta x^2}{kT}}$ جہاں x ہٹاؤ، k بولٹز مین کا مستقلہ اور T تپش ہے۔ اگر

α اور β مستقل ہوں تب α کی ابعادی مساوات ہے :

Options :

70819168161. $[M L T^{-2}]$

70819168162. $[M^0 L T^0]$

70819168163. $[M L T^{-1}]$

70819168164. $[M^2 L T^{-2}]$

Question Number : 2 Question Id : 70819121005 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 : Body 'P' having mass M moving with speed 'u' has head-on collision elastically with another body 'Q' having mass 'm' initially at rest. If m << M, body 'Q' will have a maximum speed equal to '2u' after collision.

Reason R : During elastic collision, the momentum and kinetic energy are both conserved.

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

Options :

70819168165. Both A and R are correct and R is the correct explanation of A.

70819168166. Both A and R are correct but R is NOT the correct explanation of A.

70819168167. A is correct but R is not correct.

70819168168. A is not correct but R is correct.

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Question Number : 2 Question Id : 70819121005 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ذیل میں بیان اور اس کی وجہ دی گئی ہے۔

بیان۔ A : شے 'P' جس کی کمیت M ہے، وہ چال 'u' سے حرکت کرتے ہوئے دوسرے 'm' کمیت کے حالت سکون میں پائے جانے والی شے 'Q' سے آمنے سامنے سے لچکدار تصادم کرتا ہے۔ اگر M << m ہو تب شے Q کی تصادم کے بعد اعظم ترین چال '2u' ہو سکتی ہے۔

وجہ۔ R : لچکدار تصادم کے دوران اشیاء کی معیار حرکت اور توانائی بالحرکت کی بقا (conserved) رہتی ہے۔

اوپر دیئے گئے بیان اور اس کی وجہ سے متعلق متبادلات دیئے گئے ہیں۔ ان میں صحیح متبادل چنیے :

Options :

70819168165. دونوں بیان۔ A اور اس کی وجہ R صحیح ہے۔ اور وجہ R ، بیان A کا مکمل وضاحت کرتا ہے۔

70819168166. دونوں بیان۔ A اور اس کی وجہ R صحیح ہے لیکن وجہ R ، بیان A کی صحیح وضاحت نہیں کرتا ہے۔

70819168167. بیان A صحیح ہے جبکہ وجہ R غلط ہے۔

70819168168. بیان A غلط ہے جبکہ وجہ R صحیح ہے۔

Question Number : 3 Question Id : 70819121006 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A planet revolving in elliptical orbit has :

A. a constant velocity of revolution.

B. has the least velocity when it is nearest to the sun.

C. its areal velocity is directly proportional to its velocity.

D. areal velocity is inversely proportional to its velocity.

E. to follow a trajectory such that the areal velocity is constant.

Choose the correct answer from the options given below :

Options :

70819168169. A only

70819168170. C only

70819168171. D only

70819168172. E only

Question Number : 3 Question Id : 70819121006 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ایک سیارح بیضوی مدار میں حرکت کررہا ہے اس کے متعلق ذیل میں بیان دیے گئے ہیں۔

A. سیارہ کی گردش کی رفتار مستقل ہوتی ہے

B. سیارہ کی مدار میں رفتار اس وقت سب سے کم ہوتی ہے جب وہ سورج کے قریب ہوتا ہے

C. اس کی سطحی رفتار اس کی رفتار سے راست تناسب میں ہوتی ہے

D. اس کی سطحی رفتار (areal velocity) اس کی رفتار کے معکوس تناسب میں ہوتی ہے

E. سطحی رفتار (areal velocity) مستقل ہوتی ہے

ذیل میں دیے گئے متبادلات میں صحیح متبادل چنیے :

Options :

70819168169. A صرف

70819168170. C صرف

70819168171. D صرف

70819168172. E صرف

Question Number : 4 Question Id : 70819121007 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

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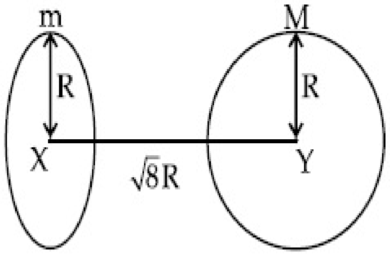
Correct Marks : 4 Wrong Marks : 1

Find the gravitational force of attraction between the ring and sphere as shown in the diagram, where the plane of the ring is perpendicular to the line joining the centres. If $\sqrt{8}R$ is the distance between the centres of a ring (of mass 'm') and a sphere (mass 'M') where both have equal radius 'R'.



Options :

70819168173. $\frac{\sqrt{8}}{27} \cdot \frac{GmM}{R^2}$

70819168174. $\frac{\sqrt{8}}{9} \cdot \frac{GmM}{R}$

70819168175. $\frac{1}{3\sqrt{8}} \cdot \frac{GMm}{R^2}$

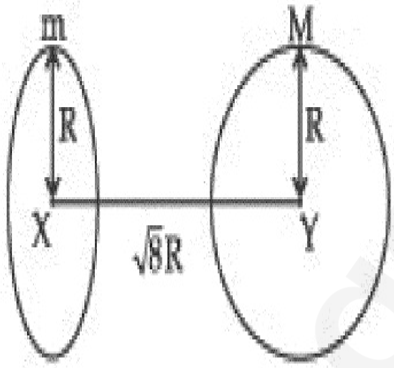
70819168176. $\frac{2\sqrt{2}}{3} \cdot \frac{GMm}{R^2}$

Question Number : 4 Question Id : 70819121007 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

شکل میں دکھائی دے رہے ایک حلقہ اور کرہ کے درمیان عامل قوت کشش معلوم کیجئے جبکہ حلقہ کی سطح مرکزوں کو جوڑنے والے خط کے عموداً ہے اور حلقہ

(کمیت m) اور کرہ (کمیت M) کے مرکزوں کے درمیان کا فاصلہ $\sqrt{8}R$ ہے۔ اور دونوں کا نصف قطر مساوی R ہے۔



Options :

70819168173. $\frac{\sqrt{8}}{27} \cdot \frac{GmM}{R^2}$

70819168174. $\frac{\sqrt{8}}{9} \cdot \frac{GmM}{R}$

70819168175. $\frac{1}{3\sqrt{8}} \cdot \frac{GMm}{R^2}$

70819168176. $\frac{2\sqrt{2}}{3} \cdot \frac{GMm}{R^2}$

Question Number : 5 Question Id : 70819121008 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Four identical solid spheres each of mass 'm' and radius 'a' are placed with their centres on the four corners of a square of side 'b'. The moment of inertia of the system about one side of square where the axis of rotation is parallel to the plane of the square is :

Options :

70819168177. $\frac{4}{5}ma^2 + 2mb^2$

70819168178. $\frac{8}{5}ma^2 + 2mb^2$

70819168179. $\frac{8}{5}ma^2 + mb^2$

70819168180. $\frac{4}{5}ma^2$

Question Number : 5 Question Id : 70819121008 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

'm' کمیت اور 'a' نصف قطر والے چار مکمل ایک طرح کے ٹھوس کروں کے مرکزوں کو 'b' ضلع کی لمبائی رکھنے والے مربع کے چار نقطہ راس کناروں پر رکھا گیا ہو تب اس نظام کا مربع کے کسی ایک ضلع سے گزرنے والے محور کے اطراف جمود کا معیارِ اثر ہوگا :

Options :

70819168177. $\frac{4}{5} ma^2 + 2mb^2$

70819168178. $\frac{8}{5} ma^2 + 2mb^2$

70819168179. $\frac{8}{5} ma^2 + mb^2$

70819168180. $\frac{4}{5} ma^2$

Question Number : 6 Question Id : 70819121009 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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A large number of water drops, each of radius r, combine to have a drop of radius R. If the surface tension is T and mechanical equivalent of heat is J, the rise in heat energy per unit volume will be :

Options :

70819168181. $\frac{2T}{J}\left(\frac{1}{r}-\frac{1}{R}\right)$

70819168182. $\frac{3T}{J}\left(\frac{1}{r}-\frac{1}{R}\right)$

70819168183. $\frac{3T}{rJ}$

70819168184. $\frac{2T}{rJ}$

Question Number : 6 Question Id : 70819121009 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

اگر r نصف قطر کے پانی کے کئی قطرات مل کر ایک R نصف قطر کا بڑا قطرہ بناتے ہیں ۔ اگر سطحی تناؤ T اور حرارت کا میکانکی معادل J ہو تب اس بڑے قطرے کی حرارتی توانائی فی اکائی حجم میں اضافہ :

Options :

70819168181. $\frac{2T}{J}\left(\frac{1}{r}-\frac{1}{R}\right)$

70819168182. $\frac{3T}{J}\left(\frac{1}{r}-\frac{1}{R}\right)$

70819168183. $\frac{3T}{rJ}$

70819168184.

$\frac{2T}{rJ}$

Question Number : 7 Question Id : 70819121010 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The normal density of a material is ρ and its bulk modulus of elasticity is K. The magnitude of increase in density of material, when a pressure P is applied uniformly on all sides, will be :

Options :

70819168185. $\frac{\rho P}{K}$

70819168186. $\frac{K}{\rho P}$

70819168187. $\frac{\rho K}{P}$

70819168188. $\frac{PK}{\rho}$

Question Number : 7 Question Id : 70819121010 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ایک شے کی کثافت ρ اور اس کا حجمی مقیاس K ہے۔ اگر اس شے کے تمام بازو سے دباؤ P لگائیں تب اس شے کی کثافت میں ہونے والا اضافہ :

Options :

70819168185. $\frac{\rho P}{K}$

70819168186. $\frac{K}{\rho P}$

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70819168187. $\frac{\rho K}{P}$

70819168188. $\frac{PK}{\rho}$

Question Number : 8 Question Id : 70819121011 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Assume that a tunnel is dug along a chord of the earth, at a perpendicular distance (R/2) from the earth's centre, where 'R' is the radius of the Earth. The wall of the tunnel is frictionless. If a particle is released in this tunnel, it will execute a simple harmonic motion with a time period :

Options :

70819168189. $\frac{2\pi R}{g}$

70819168190. $2\pi\sqrt{\frac{R}{g}}$

70819168191. $\frac{1}{2\pi}\sqrt{\frac{g}{R}}$

70819168192. $\frac{g}{2\pi R}$

Question Number : 8 Question Id : 70819121011 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

فرض کیجئے کہ زمین کے مرکز سے عمودی فاصلہ (R/2) پر ایک سُرنگ (tunnel) کھودی گئی۔ اگر زمین کا نصف قطر 'R' اور وہ سرنگ کی رگڑ کی قوت صفر ہو تب اس سرنگ میں چھوڑے گئے جسم کی سادہ ہارمونی حرکت (SHM) کا دور :

Options :

70819168189. $\frac{2\pi R}{g}$

70819168190. $2\pi\sqrt{\frac{R}{g}}$

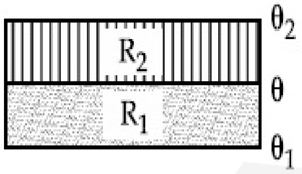
70819168191. $\frac{1}{2\pi}\sqrt{\frac{g}{R}}$

70819168192. $\frac{g}{2\pi R}$

Question Number : 9 Question Id : 70819121012 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The temperature θ at the junction of two insulating sheets, having thermal resistances R_1 and R_2 as well as top and bottom temperatures θ_1 and θ_2 (as shown in figure) is given by :



Options :

70819168193. $\frac{\theta_1 R_2 + \theta_2 R_1}{R_1 + R_2}$

70819168194. $\frac{\theta_1 R_1 + \theta_2 R_2}{R_1 + R_2}$

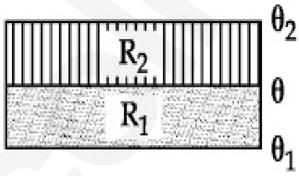
70819168195. $\frac{\theta_1 R_2 - \theta_2 R_1}{R_2 - R_1}$

70819168196. $\frac{\theta_2 R_2 - \theta_1 R_1}{R_2 - R_1}$

Question Number : 9 Question Id : 70819121012 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

دو مجوز (غیر موصل) شیٹ جن کی حرارتی مزاحمت R_1 اور R_2 ہے ان کے جوڑ کی تپش θ کیا ہوگی جبکہ ان شیٹ کے اوپر کی تپش θ_2 اور نچلے سرے کی تپش θ_1 ہے جیسا کہ شکل میں دکھایا گیا۔



Options :

70819168193. $\frac{\theta_1 R_2 + \theta_2 R_1}{R_1 + R_2}$

70819168194. $\frac{\theta_1 R_1 + \theta_2 R_2}{R_1 + R_2}$

70819168195. $\frac{\theta_1 R_2 - \theta_2 R_1}{R_2 - R_1}$

70819168196. $\frac{\theta_2 R_2 - \theta_1 R_1}{R_2 - R_1}$

Question Number : 10 Question Id : 70819121013 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A particle is moving with uniform speed along the circumference of a circle of radius R under the action of a central fictitious force F which is inversely proportional to R^3. Its time period of revolution will be given by :

Options :

70819168197. $T \propto R^{\frac{3}{2}}$

70819168198. $T \propto R^{\frac{4}{3}}$

70819168199. $T \propto R^2$

70819168200. $T \propto R^{\frac{5}{2}}$

Question Number : 10 Question Id : 70819121013 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ایک ذرہ یکساں چال سے R نصف قطر کے دائرے کے محیط پر مرکزی قوت F کے زیر اثر حرکت کر رہا ہے۔ اگر قوت F ، R^3 کے معکوس ہو تب اس حرکت کے گردش کا دور ہوگا :

Options :

70819168197. $T \propto R^{\frac{3}{2}}$

70819168198. $T \propto R^{\frac{4}{3}}$

70819168199. $T \alpha R^2$

70819168200. $T \propto R^{\frac{5}{2}}$

Question Number : 11 Question Id : 70819121014 Question Type : MCQ Option Shuffling : Yes

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Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If two similar springs each of spring constant K_1 are joined in series, the new spring constant and time period would be changed by a factor :

Options :

70819168201. $\frac{1}{2}, \sqrt{2}$

70819168202. $\frac{1}{4}, 2\sqrt{2}$

70819168203. $\frac{1}{2}, 2\sqrt{2}$

70819168204. $\frac{1}{4}, \sqrt{2}$

Question Number : 11 Question Id : 70819121014 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

دوایک جیسے اسپرنگ جن کا اسپرنگ مستقل K_1 ہے ان کو تسلسل میں جوڑا گیا تب اس جوڑ کا اسپرنگ کا مستقلہ اور اس کے اہتزاز کا دور کتنے گنا سے تبدیل ہوگا :

Options :

70819168201. $\frac{1}{2}, \sqrt{2}$

70819168202. $\frac{1}{4}, 2\sqrt{2}$

70819168203. $\frac{1}{2}, 2\sqrt{2}$

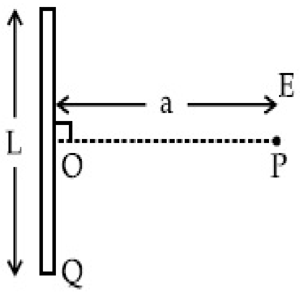
70819168204. $\frac{1}{4}, \sqrt{2}$

Question Number : 12 Question Id : 70819121015 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Find the electric field at point P (as shown in figure) on the perpendicular bisector of a uniformly charged thin wire of length L carrying a charge Q. The distance of the point P from the centre of the rod is $a = \frac{\sqrt{3}}{2} L$.



Options :

70819168205. $\frac{Q}{3\pi\varepsilon_0 L^2}$

70819168206. $\frac{Q}{4\pi\varepsilon_0 L^2}$

70819168207. $\frac{\sqrt{3}Q}{4\pi\varepsilon_0 L^2}$

70819168208. $\frac{Q}{2\sqrt{3}\pi\varepsilon_0 L^2}$

Question Number : 12 Question Id : 70819121015 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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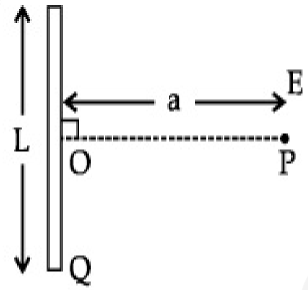
L لمبائی والے یکساں پتلے تار سے برقی بار Q گذرتا ہو تب اس کے عمودی ناصف پر پائے جانے والے نقطہ P پر برقی میدان کی حدت کیا ہوگی جبکہ نقطہ P کا تار کے مرکز سے فاصلہ L $a = \frac{\sqrt{3}}{2}$ ہے ؟



Options :

70819168205. $\frac{Q}{3\pi\varepsilon_0 L^2}$

70819168206. $\frac{Q}{4\pi\varepsilon_0 L^2}$

70819168207. $\frac{\sqrt{3}Q}{4\pi\varepsilon_0 L^2}$

70819168208. $\frac{Q}{2\sqrt{3}\pi\varepsilon_0 L^2}$

Question Number : 13 Question Id : 70819121016 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Consider the combination of 2 capacitors C_1 and C_2, with $C_2 > C_1$, when connected in parallel, the equivalent capacitance is $\frac{15}{4}$ times the equivalent capacitance of the same connected in series. Calculate the ratio of capacitors, $\frac{C_2}{C_1}$.

Options :

70819168209. $\frac{29}{15}$

70819168210. $\frac{15}{11}$

70819168211. $\frac{15}{4}$

70819168212. $\frac{111}{80}$

Question Number : 13 Question Id : 70819121016 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

C_1 اور C_2 گنجائش والے دو کپیسٹروں $(C_2 > C_1)$ کو جب متوازی جوڑیں تب ماحاصل گنجائش ان کپیسٹروں کو تسلسل میں جوڑنے پر ماحاصل گنجائش کا $\frac{15}{4}$ گنا حاصل ہوتی ہو تب $\frac{C_2}{C_1}$ کی قدر :

Options :

70819168209. $\frac{29}{15}$

70819168210. $\frac{15}{11}$

70819168211. $\frac{15}{4}$

70819168212. $\frac{111}{80}$

Question Number : 14 Question Id : 70819121017 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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An alternating current is given by the equation $i = i_1 \sin \omega t + i_2 \cos \omega t$. The rms current will be :

Options :

70819168213. $\frac{1}{\sqrt{2}}(i_1 + i_2)$

70819168214. $\frac{1}{\sqrt{2}}(i_1 + i_2)^2$

70819168215. $\frac{1}{\sqrt{2}}\left(i_1^2 + i_2^2\right)^{\frac{1}{2}}$

70819168216. $\frac{1}{2}\left(i_1^2 + i_2^2\right)^{\frac{1}{2}}$

Question Number : 14 Question Id : 70819121017 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

اگر متبادلہ برقی کرنٹ کی مساوات $i = i_1 \sin \omega t + i_2 \cos \omega t$ ہو تب اس برقی کرنٹ کی جذر اوسط مربع قدر :

Options :

70819168213. $\frac{1}{\sqrt{2}}(i_1 + i_2)$

70819168214. $\frac{1}{\sqrt{2}}(i_1 + i_2)^2$

70819168215. $\frac{1}{\sqrt{2}}\left(i_1^2 + i_2^2\right)^{\frac{1}{2}}$

70819168216. $\frac{1}{2}\left(i_1^2 + i_2^2\right)^{\frac{1}{2}}$

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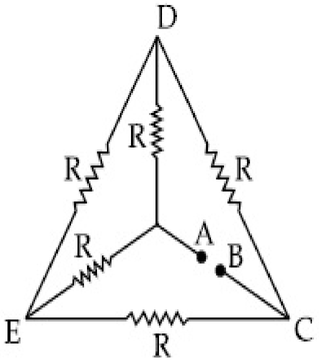
Question Number : 15 Question Id : 70819121018 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Five equal resistances are connected in a network as shown in figure. The net resistance between the points A and B is :



Options :

70819168217. $2R$

70819168218. $\frac{R}{2}$

70819168219. R

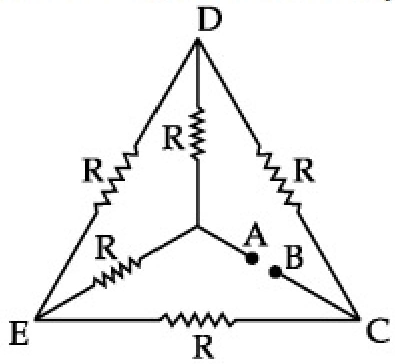
70819168220. $\frac{3R}{2}$

Question Number : 15 Question Id : 70819121018 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

پانچ مساوی مزاحمتوں کو برقی دور کے مطابق جوڑا گیا ہو تب سرے B اور A کے درمیان کی ماحصل مزاحمت :



Options :

70819168217. 2R

70819168218. $\frac{R}{2}$

70819168219. R

70819168220. $\frac{3R}{2}$

Question Number : 16 Question Id : 70819121019 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A short straight object of height 100 cm lies before the central axis of a spherical mirror whose focal length has absolute value $|f| = 40$ cm. The image of object produced by the mirror is of height 25 cm and has the same orientation of the object. One may conclude from the information :

Options :

70819168221. Image is virtual, opposite side of concave mirror.

70819168222. Image is real, same side of concave mirror.

70819168223. Image is virtual, opposite side of convex mirror.

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70819168224. Image is real, same side of convex mirror.

Question Number : 16 Question Id : 70819121019 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

100 cm بلندی والے چھوٹے سیدھے شے کو ایک کروی آئینہ کے مرکزی محور کے سامنے رکھا گیا۔ کروی آئینہ کا طول ماسکہ کی مطلق قیمت $|f| = 40$ cm ہے۔ اس آئینہ سے حاصل عکس کی بلندی 25 cm اور وہ اُسی شے کی حالت میں ہوتا ہے تب اس سے ہم یہ نتیجہ اخذ کرسکتے ہیں کہ :

Options :

70819168221. عکس مجازی اور اس مقعر آئینہ کے مخالف جانب

70819168222. عکس حقیقی اور مقعر آئینہ کے اُسی جانب

70819168223. عکس مجازی اور اسی محدب آئینہ کے مخالف سمت

70819168224. عکس حقیقی اور اس محدب آئینہ کے اُسی جانب

Question Number : 17 Question Id : 70819121020 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In a Young's double slit experiment two slits are separated by 2 mm and the screen is placed one meter away. When a light of wavelength 500 nm is used, the fringe separation will be :

Options :

70819168225. 1 mm

70819168226. 0.75 mm

70819168227. 0.50 mm

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70819168228. 0.25 mm

Question Number : 17 Question Id : 70819121020 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ینگ کے دوہرے منشور کے تجربے میں جھری کے درمیان کے فاصلہ 2 mm ، جھری سے پردے کا فاصلہ 1 m ہے۔ اگر استعمال نور کی طول موج 500 nm ہو تب حاصل پٹی کی چوڑائی :

Options :

70819168225. 1 mm

70819168226. 0.75 mm

70819168227. 0.50 mm

70819168228. 0.25 mm

Question Number : 18 Question Id : 70819121021 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 : An electron microscope can achieve better resolving power than an optical microscope.

Reason R : The de Broglie's wavelength of the electrons emitted from an electron gun is much less than wavelength of visible light.

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

Options :

70819168229. Both A and R are true and R is the correct explanation of A.

70819168230. Both A and R are true but R is NOT the correct explanation of A.

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70819168231. A is true but R is false.

70819168232. A is false but R is true.

Question Number : 18 Question Id : 70819121021 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ذیل میں دو بیان دیے گئے ہیں۔ پہلے کو بیان۔A اور دوسرے کو اس کی وجہ۔R کے نام دیے گئے ہیں۔

بیان۔A : ایک الیکٹرون مائکرواسکوپ کی مدد سے ہم بہتر تحلیلی طاقت حاصل کرتے ہیں بمقابلہ نوری مائکرواسکوپ کے

وجہ۔R : الیکٹرون گن سے خارج ہونے والے الیکٹرون شعاع کی ڈی بروگلی طول لہر دکھائی دینے والی نوری طول لہر سے بہت کم ہوتی ہے۔

اوپر دیے گئے بیان اور اس کی وجہ سے متعلق متبادلات دیے گئے ہیں۔ ان میں صحیح متبادل کو چنیے۔

Options :

70819168229. دونوں بیان۔A اور اس کی وجہ R صحیح ہے اور وجہ R، بیان۔A کا مکمل وضاحت کرتا ہے۔

70819168230. دونوں بیان۔A اور اس کی وجہ R صحیح ہے لیکن وجہ R، بیان۔A کا مکمل وضاحت نہیں کرتا ہے۔

70819168231. بیان۔A صحیح ہے جبکہ وجہ R غلط ہے۔

70819168232. بیان۔A غلط ہے جبکہ وجہ R صحیح ہے۔

Question Number : 19 Question Id : 70819121022 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If λ_1 and λ_2 are the wavelengths of the third member of Lyman and first member of the Paschen series respectively, then the value of $\lambda_1 : \lambda_2$ is :

Options :

70819168233. 7 : 108

70819168234. 7 : 135

70819168235. 1 : 3

70819168236. 1 : 9

Question Number : 19 Question Id : 70819121022 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

اگر λ_1 اور λ_2 بالترتیب لائمن سلسلہ طیف کے تیسرے خط اور پاشن سلسلہ طیف کے پہلے خط کی طول لہر ہو تب $\lambda_1 : \lambda_2$ کی قدر :

Options :

70819168233. 7 : 108

70819168234. 7 : 135

70819168235. 1 : 3

70819168236. 1 : 9

Question Number : 20 Question Id : 70819121023 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

LED is constructed from Ga-As-P semiconducting material. The energy gap of this LED is 1.9 eV. Calculate the wavelength of light emitted and its colour.
[$h = 6.63 \times 10^{-34}$ Js and $c = 3 \times 10^{8}$ ms^{-1}]

Options :

70819168237. 654 nm and red colour

70819168238. 654 nm and orange colour

70819168239. 1046 nm and blue colour

70819168240. 1046 nm and red colour

Question Number : 20 Question Id : 70819121023 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ایک Ga-As-P کے بنے LED میں توانائی پٹی کا فرق (energy gap) 1.9 eV ہے۔ بتایئے اس سے خارج ہونے والی نور کی طول لہر اور رنگ کیا ہوگا۔

[$h = 6.63 \times 10^{-34}$ Js اور $c = 3 \times 10^{8}$ ms^{-1}]

Options :

70819168237. 654 nm اور سرخ رنگ

70819168238. 654 nm اور نارنگی رنگ

70819168239. 1046 nm اور نیلا رنگ

70819168240. 1046 nm اور سرخ رنگ

Physics Section B

Section Id : 708191941

Section Number : 2

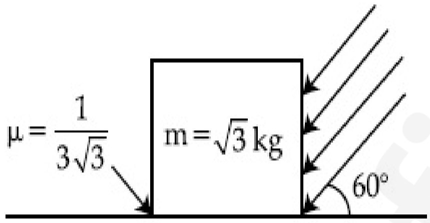
Section type :	Online
Mandatory or Optional :	Mandatory
Number of Questions :	10
Number of Questions to be attempted :	5
Section Marks :	20
Mark As Answered Required? :	Yes
Sub-Section Number :	1
Sub-Section Id :	7081911221
Question Shuffling Allowed :	Yes

Question Number : 21 Question Id : 70819121024 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

As shown in the figure, a block of mass $\sqrt{3}$ kg is kept on a horizontal rough surface of coefficient of friction $\frac{1}{3\sqrt{3}}$. The critical force to be applied on the vertical surface as shown at an angle 60° with horizontal such that it does not move, will be $3x$. The value of x will be ________.

$[g = 10\ m/s^2 ;\ \sin 60° = \frac{\sqrt{3}}{2};\ \cos 60° = \frac{1}{2}]$



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

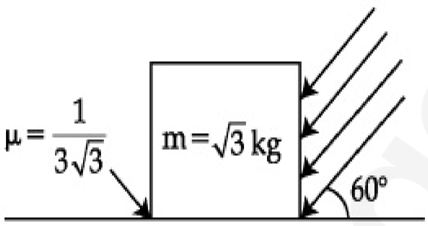
5 to 5.001

Question Number : 21 Question Id : 70819121024 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

شکل میں دکھائے گئے انداز میں $\sqrt{3}$ kg کمیت کے ایک کندے کو مسطح کھردری سطح پر رکھا گیا جس کے رگڑ کا ضریب $\frac{1}{3\sqrt{3}}$ ہے۔ اس کی عمودی سطح پر وہ اعظم ترین قوت 3x ہو جو کہ سطح کے ساتھ 60° کا زاویہ بناتے ہوئے اس طرح لگائی جائے کہ کندہ کوئی حرکت نہ کرے۔ تب x کی قدر ہوگی :

$[g = 10\ m/s^2 ;\ \sin 60^\circ = \frac{\sqrt{3}}{2} ;\ \cos 60^\circ = \frac{1}{2}]$



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 : 22 Question Id : 70819121025 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A boy pushes a box of mass 2 kg with a force $\vec{F} = \left(20\hat{i} + 10\hat{j}\right)$ N on a frictionless surface. If the box was initially at rest, then ________ m is displacement along the x-axis after 10 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 : 22 Question Id : 70819121025 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ایک لڑکا 2 kg کمیت کے ایک ڈبے کو مسطح بے رگڑ سطح پر $\vec{F} = (20\hat{i} + 10\hat{j})$ N کی قوت سے دھکیل رہا ہے۔ اگر ابتداء میں وہ ڈبہ حالت سکون میں ہو تب بتایئے 10 s کے وقفہ کے بعد x محوری سطح میں ڈبہ کے ہٹاؤ کی قدر ________ m (قریب ترین مکمل عدد) 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 : 23 Question Id : 70819121026 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A person standing on a spring balance inside a stationary lift measures 60 kg. The weight of that person if the lift descends with uniform downward acceleration of 1.8 m/s^2 will be ________ N. $[g = 10\ m/s^2]$

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 : 70819121026 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

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ایک شخص ساکن حالت میں پائی جانے والی لفٹ میں لگے اسپرنگ ترازو میں اپنا وزن 60 kg نوٹ کرتا ہے۔ بتایئے اگر وہ لفٹ $1.8\ m/s^2$ کے اسراع سے نیچے کی جانب حرکت کرتی ہو تب اس شخص کا وزن N _________ ہوگا۔

$[g = 10\ m/s^2]$

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 : 24 Question Id : 70819121027 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The mass per unit length of a uniform wire is 0.135 g/cm. A transverse wave of the form $y = -0.21 \sin(x + 30t)$ is produced in it, where x is in meter and t is in second. Then, the expected value of tension in the wire is $x \times 10^{-2}$ N. Value of x is _________. (Round-off to the nearest integer)

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 : 70819121027 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ایک تار کی کمیت فی اکائی طول 0.135 g/cm ہے۔ اس پر پیدا ایک عرضی لہر کے حرکت کی مساوات $y = -0.21 \sin(x + 30t)$ ہے۔ جہاں x میٹر میں اور t سیکنڈ ہے۔ اس تار پر موجود تناؤ $x \times 10^{-2}$ N ہے۔ تب x کی قدر _______ ہوگی :

(قریب ترین سالم عدد تک محسوب کریں)

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 : 70819121028 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A container is divided into two chambers by a partition. The volume of first chamber is 4.5 litre and second chamber is 5.5 litre. The first chamber contain 3.0 moles of gas at pressure 2.0 atm and second chamber contain 4.0 moles of gas at pressure 3.0 atm. After the partition is removed and the mixture attains equilibrium, then, the common equilibrium pressure existing in the mixture is $x \times 10^{-1}$ atm. 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 : 25 Question Id : 70819121028 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ایک برتن کو ایک دیوار کے ذریعے دو حصوں میں تقسیم کیا گیا۔ پہلے حصے کا حجم 4.5 litre اور دوسرے حصہ کا حجم 5.5 litre ہے۔ پہلے حصے میں 3.0 mole کمیت کی گیس 2.0 atm کے دباؤ پر پائی جاتی ہے۔ جب کہ دوسرے حصے میں 4.0 mole کمیت کی گیس 3.0 atm کے دباؤ پر پائی جاتی ہے۔ اگر دیوار کو نکال دیں تب توازن کی حالت میں اس آمیزہ کا دباؤ $x \times 10^{-1}$ atm 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 : 26 Question Id : 70819121029 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A radiation is emitted by 1000 W bulb and it generates an electric field and magnetic field at P, placed at a distance of 2 m. The efficiency of the bulb is 1.25%. The value of peak electric field at P is $x \times 10^{-1}$ V/m. Value of x is ________. (Rounded-off to the nearest integer)
[Take $\varepsilon_0 = 8.85 \times 10^{-12}\ C^2\ N^{-1}\ m^{-2}$, $c = 3 \times 10^8\ ms^{-1}$]

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 : 26 Question Id : 70819121029 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ایک 1000 W کے برقی بلب کی مدد سے 2 m کے فاصلے پر P نقطہ پر برقی اور مقناطیسی میدان کو تیار کیا گیا۔ اگر برقی بلب کی صلاحیت (efficiency) 1.25% ہو تب اس نقطہ P پر حاصل اعظم برقی میدان $x \times 10^{-1}$ V/m ہے۔ تب x کی قدر ________ ہوگی۔

[جب کہ $\varepsilon_0 = 8.85 \times 10^{-12}\ C^2\ N^{-1}\ m^{-2}$, $c = 3 \times 10^8\ ms^{-1}$]

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 : 27 Question Id : 70819121030 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

In an electrical circuit, a battery is connected to pass 20 C of charge through it in a certain given time. The potential difference between two plates of the battery is maintained at 15 V. The workdone by the battery is __________ J.

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 : 70819121030 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ایک برقی دور میں دیے گئے برقی خانے کو اس طرح سے جوڑا گیا کہ وہ دیے گئے وقفہ میں 20 C کا برقی بار گذارتا ہے۔ اگر برقی خانے کی تختیوں کے درمیان کا قوی کا فرق 15 V ہو تب اس دوران برقی خانے کے ذریعہ کیا گیا کام J __________ ہوگا۔

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

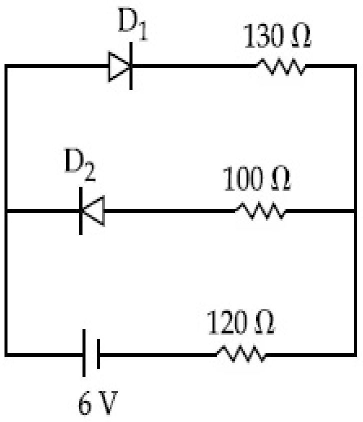
Possible Answers :

5 to 5.001

Question Number : 28 Question Id : 70819121031 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The circuit contains two diodes each with a forward resistance of 50 Ω and with infinite reverse resistance. If the battery voltage is 6 V, the current through the 120 Ω resistance is __________ mA.



Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

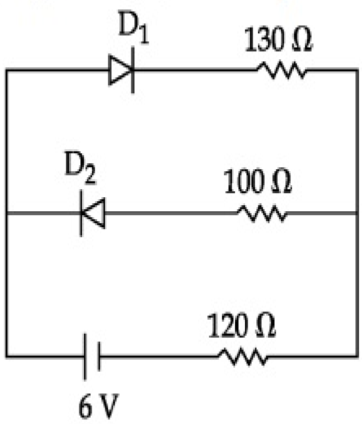
Possible Answers :

5 to 5.001

Question Number : 28 Question Id : 70819121031 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

دیے گئے برقی دور میں جوڑے گئے ڈایوڈ کی آگے کے رجحان میں مزاحمت 50 Ω اور مخالف رجحان میں مزاحمت لامتناہی ہے۔ اگر برقی خانے کا قوی 6 V ہو تب 120 Ω کی مزاحمت سے بہنے والی برقی کرنٹ mA __________ 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 : 70819121032 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The maximum and minimum amplitude of an amplitude modulated wave is 16 V and 8 V respectively. The modulation index for this amplitude modulated wave is $x \times 10^{-2}$. 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 : 29 Question Id : 70819121032 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

حیطہ موڈولیٹڈ (amplitude modulated) موج کے اعظم ترین حیطہ اور اقل ترین حیطہ کی قیمت بالترتیب 16 V اور 8 V ہو تب اس حیطہ موڈولیٹڈ موج کا موڈولیشن کا ٹ (modulation index) $x \times 10^{-2}$ 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

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Question Number : 30 Question Id : 70819121033 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

In a series LCR resonant circuit, the quality factor is measured as 100. If the inductance is increased by two fold and resistance is decreased by two fold, then the quality factor after this change 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 : 30 Question Id : 70819121033 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ایک تسلسل LCR گمگی برقی سرکٹ کے معیارِ (quality factor) کی قدر 100 ہے۔ اگر لگائے لچھے کی امالیت کو دوگنا کردیں اور مزاحمت کو دوگنے سے کم کردیں تب اس تبدیلی کے بعد معیارِ (quality factor) 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

Chemistry Section A

Section Id :	708191942
Section Number :	3

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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 : 7081911222

Question Shuffling Allowed : Yes

Question Number : 31 Question Id : 70819121034 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The orbital having two radial as well as two angular nodes is :

Options :

70819168251. 3p

70819168252. 4d

70819168253. 4f

70819168254. 5d

Question Number : 31 Question Id : 70819121034 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

کس مدار (orbital) میں دو نیم قدریائی نوڈ اور دو زاویائی نوڈ پائے جاتے ہے:

Options :

70819168251. 3p

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70819168252. 4d

70819168253. 4f

70819168254. 5d

Question Number : 32 Question Id : 70819121035 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 : Dipole-dipole interactions are the only non-covalent interactions, resulting in hydrogen bond formation.

Reason R : Fluorine is the most electronegative element and hydrogen bonds in HF are symmetrical.

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

Options :

70819168255. Both **A** and **R** are true and **R** is the correct explanation of **A**

70819168256. Both **A** and **R** are true but **R** is NOT the correct explanation of **A**

70819168257. **A** is true but **R** is false

70819168258. **A** is false but **R** is true

Question Number : 32 Question Id : 70819121035 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

مندرجہ ذیل میں دو بیانات دیے ہوئے ہیں : پہلے کو A-Assertion سے اور دوسرے کو R-Reason سے نامزد کیا گیا ہے۔

(Assertion) دعویٰ A : قطبی، قطبی باہمی عمل، ہائیڈروجن بندش میں ہونے والے واحد غیر رفت باہمی عمل ہیں ۔

(Reason) وجہ R : فلورین سب سے زیادہ منفی برقیت رکھنے والا عنصر ہے۔اور HF ہائیڈروجن بندشیں مساوی ہوتی ہے۔

مندرجہ بالا بیانات کی روشنی میں مندرج ذیل میں صحیح جواب چن کر لکھیے :

Options :

70819168255. A اور R دونوں صحیح ہیں اور A کے بارے میں R کی وضاحت کرتا ہے۔

70819168256. A اور R دونوں صحیح ہیں اور A کے بارے میں R کی وضاحت نہیں کرتا۔

70819168257. A صحیح ہے لیکن R غلط ہے۔

70819168258. A غلط ہے لیکن R صحیح ہے۔

Question Number : 33 Question Id : 70819121036 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Match List-I with List-II.

	List-I Electronic configuration of elements		List-II $\Delta_i H$ in kJ mol^{-1}
(a)	$1s^2 2s^2$	(i)	801
(b)	$1s^2 2s^2 2p^4$	(ii)	899
(c)	$1s^2 2s^2 2p^3$	(iii)	1314
(d)	$1s^2 2s^2 2p^1$	(iv)	1402

Choose the most appropriate answer from the options given below :

Options :

70819168259. (a) → (i), (b) → (iv), (c) → (iii), (d) → (ii)

70819168260. (a) → (iv), (b) → (i), (c) → (ii), (d) → (iii)

70819168261. (a) → (ii), (b) → (iii), (c) → (iv), (d) → (i)

70819168262. (a) → (i), (b) → (iii), (c) → (iv), (d) → (ii)

Question Number : 33 Question Id : 70819121036 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

فہرست-I کو فہرست-II کے ساتھ موازنہ کیجئے :

فہرست-II ($\Delta_i H$ in kJ mol^{-1})		فہرست-I (عناصروں کی الیکٹرانک تشکیل)	
801	(i)	$1s^2 2s^2$	(a)
899	(ii)	$1s^2 2s^2 2p^4$	(b)
1314	(iii)	$1s^2 2s^2 2p^3$	(c)
1402	(iv)	$1s^2 2s^2 2p^1$	(d)

مندرجہ ذیل متبادلات میں سے صحیح جواب چن کر لکھئے :

Options :

70819168259. (a) → (i), (b) → (iv), (c) → (iii), (d) → (ii)

70819168260. (a) → (iv), (b) → (i), (c) → (ii), (d) → (iii)

70819168261. (a) → (ii), (b) → (iii), (c) → (iv), (d) → (i)

70819168262. (a) → (i), (b) → (iii), (c) → (iv), (d) → (ii)

Question Number : 34 Question Id : 70819121037 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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Match List-I with List-II.

	List-I (Ore)		List-II (Element Present)
(a)	Kernite	(i)	Tin
(b)	Cassiterite	(ii)	Boron
(c)	Calamine	(iii)	Fluorine
(d)	Cryolite	(iv)	Zinc

Choose the most appropriate answer from the options given below :

Options :

70819168263. (a) → (ii), (b) → (i), (c) → (iv), (d) → (iii)

70819168264. (a) → (iii), (b) → (i), (c) → (ii), (d) → (iv)

70819168265. (a) → (ii), (b) → (iv), (c) → (i), (d) → (iii)

70819168266. (a) → (i), (b) → (iii), (c) → (iv), (d) → (ii)

Question Number : 34 Question Id : 70819121037 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

فہرست-I کو فہرست-II کے ساتھ موازنہ کیجئے :

	فہرست-I (Ore) کچ دھات		فہرست-II (عناصر کی موجودگی)
(a)	Kernite	(i)	Tin
(b)	Cassiterite	(ii)	Boron
(c)	Calamine	(iii)	Fluorine
(d)	Cryolite	(iv)	Zinc

ذیل میں سے صحیح جواب اخذ کیجئے :

Options :

70819168263. (a) → (ii), (b) → (i), (c) → (iv), (d) → (iii)

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70819168264. (a) → (iii), (b) → (i), (c) → (ii), (d) → (iv)

70819168265. (a) → (ii), (b) → (iv), (c) → (i), (d) → (iii)

70819168266. (a) → (i), (b) → (iii), (c) → (iv), (d) → (ii)

Question Number : 35 Question Id : 70819121038 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Statements about heavy water are given below.

A. Heavy water is used in exchange reactions for the study of reaction mechanisms.

B. Heavy water is prepared by exhaustive electrolysis of water.

C. Heavy water has higher boiling point than ordinary water.

D. Viscosity of H_2O is greater than D_2O.

Choose the most appropriate answer from the options given below :

Options :

70819168267. A and B only

70819168268. A and C only

70819168269. A and D only

70819168270. A, B and C only

Question Number : 35 Question Id : 70819121038 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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وزنی پانی کے تعلق سے بیانات دیے گئے ہیں :

A. تعمل کے میکانکی عمل کے مطالعے میں وزنی پانی کو متبادل تعمل (exchange reactions) کے لیے استعمال کرتے ہیں۔

B. پانی کی برق پاشیدگی سے وزنی پانی کی تیاری ہوتی ہے۔

C. وزنی پانی کے نقطۂ جوش زیادہ ہوتا ہے بمقابلے عام پانی کے۔

D. پانی کی لزوجیت (Viscosity) D_2O سے زیادہ ہوتی ہے۔

مندرجہ ذیل میں سے صحیح جواب چن کر لکھیے :

Options :

70819168267. A اور B صرف

70819168268. A اور C صرف

70819168269. A اور D صرف

70819168270. A, B اور C صرف

Question Number : 36 Question Id : 70819121039 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Find A, B and C in the following reactions :

$NH_3 + A + CO_2 \rightarrow (NH_4)_2CO_3$

$(NH_4)_2CO_3 + H_2O + B \rightarrow NH_4HCO_3$

$NH_4HCO_3 + NaCl \rightarrow NH_4Cl + C$

Options :

70819168271. $A - H_2O$; $B - O_2$; $C - Na_2CO_3$

70819168272. $A - H_2O$; $B - O_2$; $C - NaHCO_3$

70819168273. $A - H_2O$; $B - CO_2$; $C - NaHCO_3$

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70819168274. $A - O_2$; $B - CO_2$; $C - Na_2CO_3$

Question Number : 36 Question Id : 70819121039 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

مندرجہ ذیل تعمل میں سے A، B اور C کو بتایئے :

$$NH_3 + A + CO_2 \rightarrow (NH_4)_2CO_3$$

$$(NH_4)_2CO_3 + H_2O + B \rightarrow NH_4HCO_3$$

$$NH_4HCO_3 + NaCl \rightarrow NH_4Cl + C$$

Options :

70819168271. $A - H_2O$; $B - O_2$; $C - Na_2CO_3$

70819168272. $A - H_2O$; $B - O_2$; $C - NaHCO_3$

70819168273. $A - H_2O$; $B - CO_2$; $C - NaHCO_3$

70819168274. $A - O_2$; $B - CO_2$; $C - Na_2CO_3$

Question Number : 37 Question Id : 70819121040 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Compound A used as a strong oxidizing agent is amphoteric in nature. It is the part of lead storage batteries. Compound A is :

Options :

70819168275. PbO

70819168276. PbO_2

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70819168277. Pb_3O_4

70819168278. $PbSO_4$

Question Number : 37 Question Id : 70819121040 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

مرکب A جو کہ ایک طاقتور تکسیدی متعامل ہے، دو رو خیہ نوعیت رکھتا ہے۔ یہ مرکب ذخیرہ خانہ بیٹری (lead storage battery) کا حصہ ہوتا ہے
تو مرکب A ہے۔

Options :

70819168275. PbO

70819168276. PbO_2

70819168277. Pb_3O_4

70819168278. $PbSO_4$

Question Number : 38 Question Id : 70819121041 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which one of the following lanthanoids does not form MO_2 ?
[M is lanthanoid metal]

Options :

70819168279. Nd

70819168280. Dy

70819168281. Pr

70819168282. Yb

Question Number : 38 Question Id : 70819121041 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

مندرجہ ذیل میں کونسا ایک lanthanoids MO_2 نہیں بناتا ؟

[M ایک لینتھنائڈ دھات ہے]

Options :

70819168279. Nd

70819168280. Dy

70819168281. Pr

70819168282. Yb

Question Number : 39 Question Id : 70819121042 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The presence of ozone in troposphere :

Options :

70819168283. protects us from the UV radiation

70819168284. protects us from the X-ray radiation

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70819168285. generates photochemical smog

70819168286. protects us from greenhouse effect

Question Number : 39 Question Id : 70819121042 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Troposphere میں اوزون کی موجودگی :

Options :

70819168283. ہمیں UV کے اشعاع سے محفوظ رکھتی

70819168284. ہمیں X-ray کے اشعاع سے محفوظ رکھتی

70819168285. فوٹو کیمیائی کُہر (smog) پیدا کرتی ہے۔

70819168286. ہمیں سبز گھر کے اثر سے محفوظ رکھتی ہے۔

Question Number : 40 Question Id : 70819121043 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : A mixture of chloroform and aniline can be separated by simple distillation.

Statement II : When separating aniline from a mixture of aniline and water by steam distillation aniline boils below its boiling point.

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

Options :

70819168287. Both Statement I and Statement II are true

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70819168288. Both Statement I and Statement II are false

70819168289. Statement I is true but Statement II is false

70819168290. Statement I is false but Statement II is true

Question Number : 40 Question Id : 70819121043 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ذیل میں دو بیانات دیے گئے ہیں۔

بیان۔ I : سادہ کشیدگی سے کلوفارم اور انیلین کے آمیزے کو علیحدہ کر سکتے

بیان۔II : جب انیلین اور پانی کے آمیزے سے انیلین کو علیحدہ بھاپ کی کشیدگی سے کیا جاتا ہے تو، انیلین اس کے نقطے جوش سے کم پر ابلنے لگتا ہے۔

مندرجہ بالا بیان کی روشنی میں مندرج ذیل میں سے صحیح جواب چن کر لکھیے :

Options :

70819168287. بیان۔I اور بیان۔ II دونوں صحیح ہیں۔

70819168288. بیان۔I اور بیان۔II دونوں غلط ہیں۔

70819168289. بیان۔I صحیح ہے لیکن بیان۔II غلط ہے۔

70819168290. بیان۔I غلط ہے لیکن بیان۔II صحیح ہے۔

Question Number : 41 Question Id : 70819121044 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the following is 'a' FALSE statement ?

Options :

70819168291. Carius tube is used in the estimation of sulphur in an organic compound.

70819168292. Carius method is used for the estimation of nitrogen in an organic compound.

70819168293. Kjeldahl's method is used for the estimation of nitrogen in an organic compound.

70819168294. Phosphoric acid produced on oxidation of phosphorus present in an organic compound is precipitated as $Mg_2P_2O_7$ by adding magnesia mixture.

Question Number : 41 Question Id : 70819121044 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

مندرجہ ذیل میں کونسا بیان غلط ہے ؟

Options :

70819168291. نامیاتی مرکب سے سلفر کی تخمین کے لیے Carius ٹیوب استعمال کرتے ہیں۔

70819168292. نامیاتی مرکب سے نائٹروجن کی تخمین کے لیے Carius کا طریقہ استعمال کرتے ہیں۔

70819168293. نامیاتی مرکب سے نائٹروجن کی تخمین کے لیے Kjeldahl کا طریقہ استعمال کرتے ہیں۔

70819168294. فاسفورس کی تکسید سے فاسفورک ایسڈ حاصل ہوتا ہے جس میں ایک رسوب $Mg_2P_2O_7$ ملتا ہے، جسے میگنیشیا (magnesia) آمیزہ ملانے سے حاصل کیا جاتا ہے۔

Question Number : 42 Question Id : 70819121045 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

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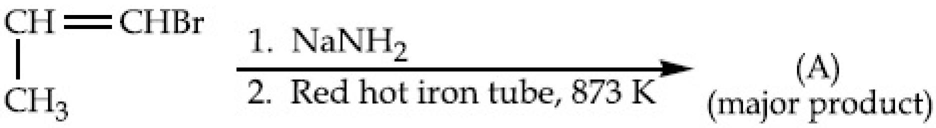
Correct Marks : 4 Wrong Marks : 1

For the given reaction :

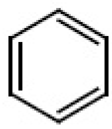


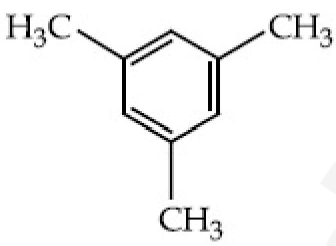
What is 'A' ?

Options :

70819168295. $\underset{\displaystyle CH_3}{\underset{|}{CH}}=CH-NH_2$

70819168296. $CH_3CH_2CH_2NH_2$

70819168297. 

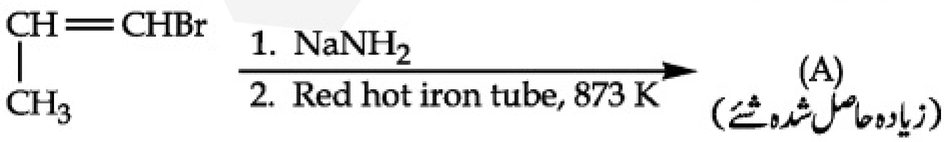
70819168298. 

Question Number : 42 Question Id : 70819121045 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

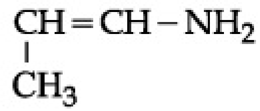
دی گئی ہوئی تعامل میں ________.



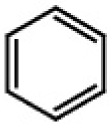
تو 'A' کیا ہے ؟

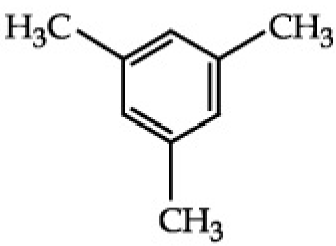
Options :

70819168295.



70819168296. $CH_3CH_2CH_2NH_2$

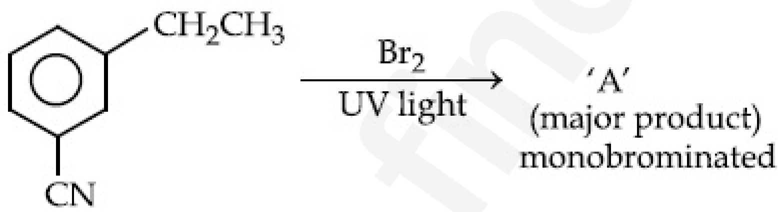
70819168297. 

70819168298. 

Question Number : 43 Question Id : 70819121046 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

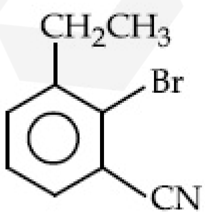
Correct Marks : 4 Wrong Marks : 1

For the given reaction :

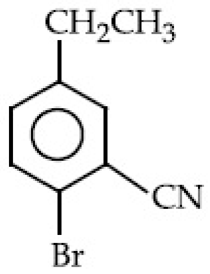


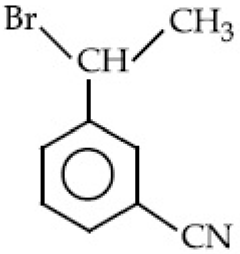
What is 'A'?

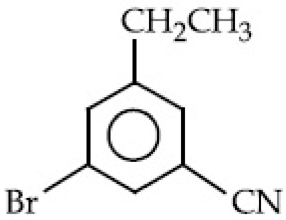
Options :

70819168299. 

70819168300.



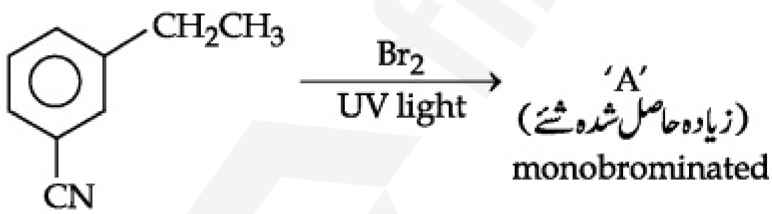
70819168301. 

70819168302. 

Question Number : 43 Question Id : 70819121046 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

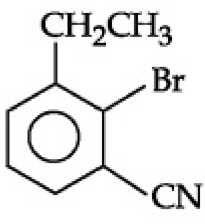
Correct Marks : 4 Wrong Marks : 1

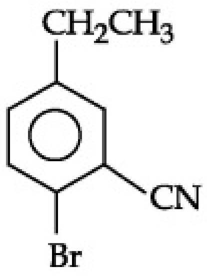
دی گئی ہوئی تعمل میں

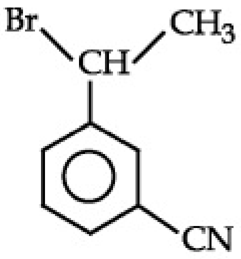


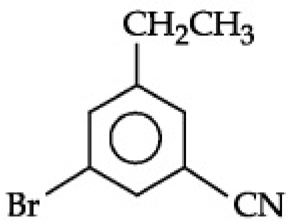
تو 'A' کیا ہے ؟

Options :

70819168299. 

70819168300. 

70819168301. 

70819168302. 

Question Number : 44 Question Id : 70819121047 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$$\underset{(C_4H_8Cl_2)}{A} \xrightarrow[373\ K]{Hydrolysis} \underset{(C_4H_8O)}{B}$$

B reacts with Hydroxyl amine but does not give Tollen's test. Identify A and B.

Options :

70819168303. 1,1-Dichlorobutane and Butanal

70819168304. 2,2-Dichlorobutane and Butanal

70819168305. 1,1-Dichlorobutane and 2-Butanone

70819168306. 2,2-Dichlorobutane and Butan-2-one

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Question Number : 44 Question Id : 70819121047 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$$\underset{(C_4H_8Cl_2)}{A} \xrightarrow[373\ K]{\text{آب پاشیدگی}} \underset{(C_4H_8O)}{B}$$

B ہائیڈروآکسیل امائن کے ساتھ عمل کرتا۔لیکن ان سے Tollen's test نہیں حاصل ہوتی۔ A اور B کی شناخت کیجئے :

Options :

70819168303. 1, 1-Dichlorobutane and Butanal

70819168304. 2, 2-Dichlorobutane and Butanal

70819168305. 1, 1-Dichlorobutane and 2-Butanone

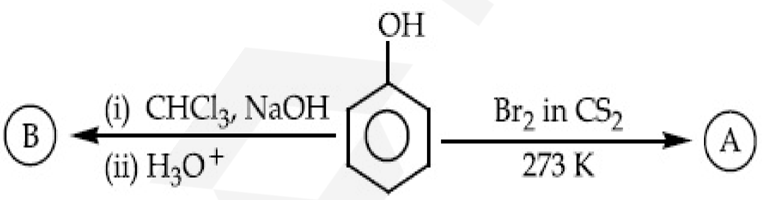
70819168306. 2, 2-Dichlorobutane and Butan-2-one

Question Number : 45 Question Id : 70819121048 Question Type : MCQ Option Shuffling : Yes

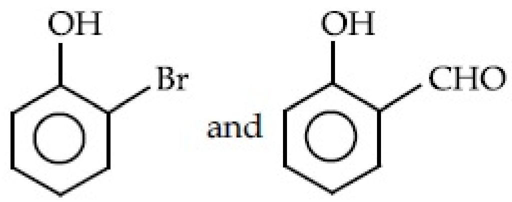
Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Identify the major products A and B respectively in the following reactions of phenol :



Options :

70819168307. 

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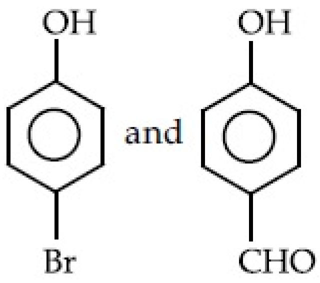
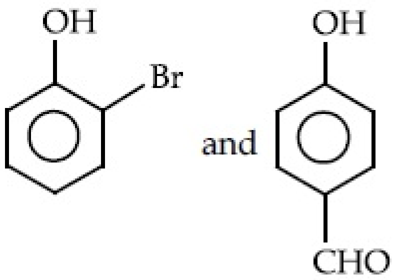
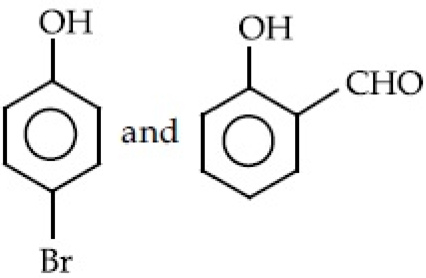
70819168308. 

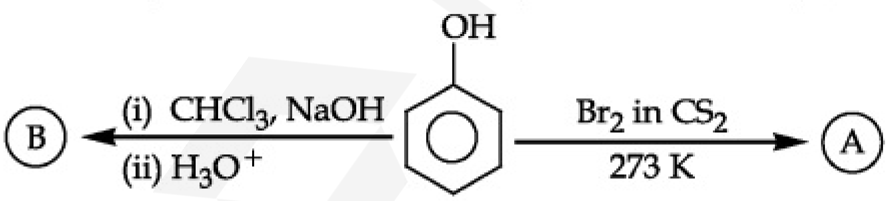
70819168309. 

70819168310. 

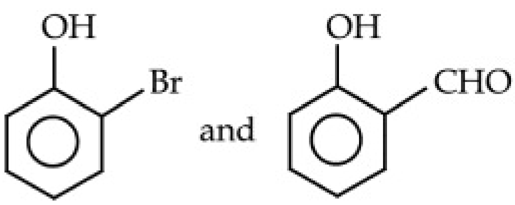
Question Number : 45 Question Id : 70819121048 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

مندرجہ ذیل میں فنال کے تعامل میں زیادہ حاصل شدہ A اور B کی شناخت کیجئے :



Options :

70819168307. 

70819168308.

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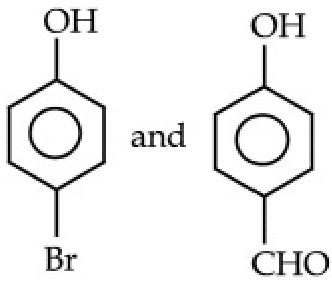
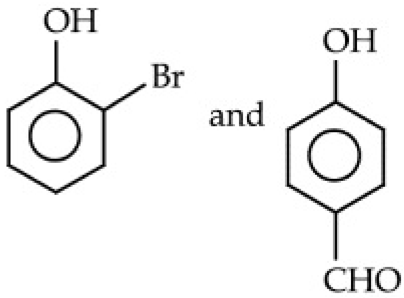
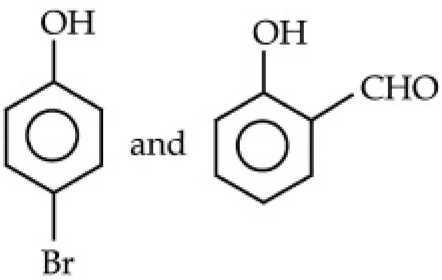


70819168309. 

70819168310. 

Question Number : 46 Question Id : 70819121049 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Given below are two statements :

Statement I : *o*-Nitrophenol is steam volatile due to intramolecular hydrogen bonding.

Statement II : *o*-Nitrophenol has high melting due to hydrogen bonding.

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

Options :

70819168311. Both Statement I and Statement II are true

70819168312. Both Statement I and Statement II are false

70819168313. Statement I is true but Statement II is false

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70819168314. Statement I is false but Statement II is true

Question Number : 46 Question Id : 70819121049 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

مندرج ذیل میں دو بیانات دیے گئے ہوئے ہیں۔

بیان۔ I : دو رسالمائی ہائیڈروجن بندش کی وجہ سے *o*-Nitrophenol تغیر پزیر ہوتا ہے۔

بیان۔II : ہائیڈروجن بندش کے وجہ سے *o*-Nitrophenol میں نقطۂ پگھلاؤ بہت زیادہ پایا جاتا ہے۔

مندرجہ بالا بیانات کی روشنی میں مندرجہ ذیل میں سے مناسب جواب چن کر لکھیے :

Options :

70819168311. بیان۔I اور بیان۔ II دونوں صحیح ہیں۔

70819168312. بیان۔I اور بیان۔ II دونوں غلط ہیں۔

70819168313. بیان۔I صحیح ہے لیکن بیان۔II غلط ہے۔

70819168314. بیان۔I غلط ہے لیکن بیان۔II صحیح ہے۔

Question Number : 47 Question Id : 70819121050 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

An amine on reaction with benzenesulphonyl chloride produces a compound insoluble in alkaline solution. This amine can be prepared by ammonolysis of ethyl chloride. The correct structure of amine is :

Options :

70819168315. $CH_3CH_2CH_2NHCH_3$

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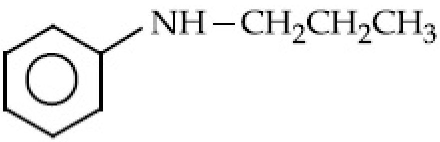
70819168316. $CH_3CH_2CH_2\overset{H}{N}-CH_2CH_3$

70819168317. 

70819168318. $CH_3CH_2NH_2$

Question Number : 47 Question Id : 70819121050 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ایک امائن کو benzenesulphonyl chloride کے ساتھ تعمل کرنے پر ایک مرکب حاصل ہوتا ہے جو اساسی محلول میں نہ حل پذیر ہوتا۔ اس
امائن کو ایتھائل کلورائیڈ سے ammonolyis سے تیار کیا جا سکتا ہے تو امائن کی صحیح ساخت بتلایئے۔

Options :

70819168315. $CH_3CH_2CH_2NHCH_3$

70819168316. $CH_3CH_2CH_2\overset{H}{N}-CH_2CH_3$

70819168317.

70819168318. $CH_3CH_2NH_2$

Question Number : 48 Question Id : 70819121051 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

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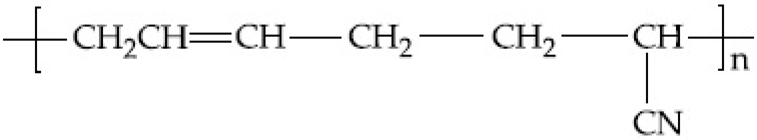
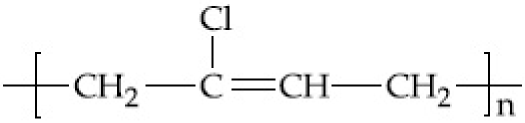
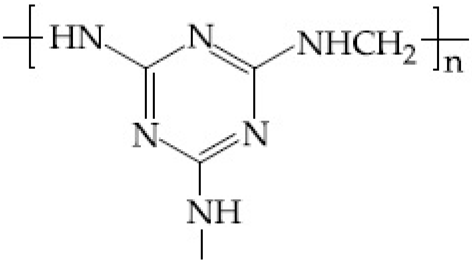
Correct Marks : 4 Wrong Marks : 1

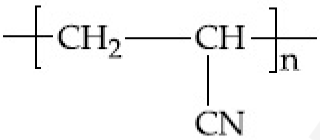
The structure of Neoprene is :

Options :

70819168319. 

70819168320. 

70819168321. 

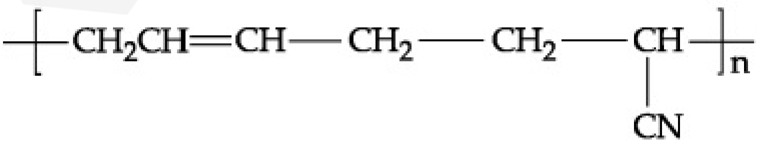
70819168322. 

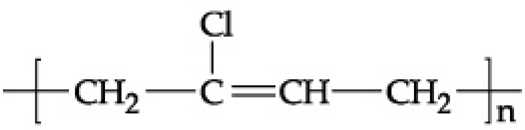
Question Number : 48 Question Id : 70819121051 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Neoprene کی ساخت ہے :

Options :

70819168319. 

70819168320. 

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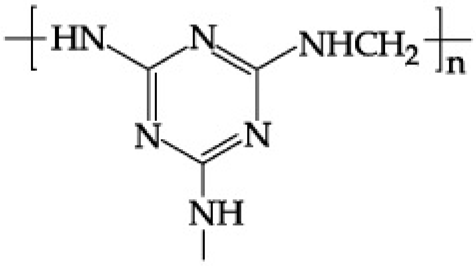
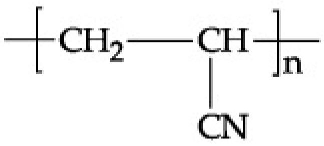
70819168321. 

70819168322. 

Question Number : 49 Question Id : 70819121052 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Which of the following vitamin is helpful in delaying the blood clotting ?

Options :

70819168323. Vitamin B

70819168324. Vitamin C

70819168325. Vitamin E

70819168326. Vitamin K

Question Number : 49 Question Id : 70819121052 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

مندرجہ ذیل میں کونسا وٹامن خون کے جمنے (blood clotting) کی رکاوٹ میں مددگار ثابت ہوتا ہے ؟

Options :

70819168323. Vitamin B

70819168324. Vitamin C

70819168325. Vitamin E

70819168326. Vitamin K

Question Number : 50 Question Id : 70819121053 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

On treating a compound with warm dil. H_2SO_4, gas X is evolved which turns $K_2Cr_2O_7$ paper acidified with dil. H_2SO_4 to a green compound Y. X and Y respectively are :

Options :

70819168327. $X = SO_3$, $Y = Cr_2(SO_4)_3$

70819168328. $X = SO_2$, $Y = Cr_2O_3$

70819168329. $X = SO_3$, $Y = Cr_2O_3$

70819168330. $X = SO_2$, $Y = Cr_2(SO_4)_3$

Question Number : 50 Question Id : 70819121053 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ایک مرکب کو ہلکا یہ سلفیورک ایسڈ (H_2SO_4) کے ساتھ گرم کیا جائے تو اس میں سے ایک X گیس خارج ہوتی ہے جو ہلکا یہ H_2SO_4 سے تیزابی کیے گئے $K_2Cr_2O_7$ کاغذ کے ساتھ عمل کرنے پر ہرے رنگ کا مرکب آدیتی ہے تو X اور Y بالترتیب :

Options :

70819168327. $X = SO_3$, $Y = Cr_2(SO_4)_3$

70819168328. $X = SO_2$, $Y = Cr_2O_3$

70819168329. $X = SO_3$, $Y = Cr_2O_3$

70819168330. $X = SO_2$, $Y = Cr_2(SO_4)_3$

Chemistry Section B

Section Id :	708191943
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 :	7081911223
Question Shuffling Allowed :	Yes

Question Number : 51 Question Id : 70819121054 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The number of significant figures in 50000.020×10^{-3} 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 : 70819121054 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

50000.020×10^{-3} میں اہم اعداد (significant figure) 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

Question Number : 52 Question Id : 70819121055 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A certain gas obeys $P(V_m - b) = RT$. The value of $\left(\frac{\partial Z}{\partial P}\right)_T$ is $\frac{xb}{RT}$. The value of x is ________.

(Integer answer) (Z : compressibility factor)

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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Question Number : 52 Question Id : 70819121055 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ایک مخصوص گیس $P(V_m - b) = RT$ پر عمل پیراں کرتی $\left(\frac{\partial Z}{\partial P}\right)_T$ کی قیمت $\frac{xb}{RT}$ ہے۔تو x کی ______ قیمت ہے۔

(جواب مکمل عدد میں) (Z : compressibility factor)

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 : 70819121056 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

For a chemical reaction $A + B \rightleftharpoons C + D$
$(\Delta_r H^\ominus = 80\ \text{kJ mol}^{-1})$ the entropy change $\Delta_r S^\ominus$ depends on the temperature T(in K) as $\Delta_r S^\ominus = 2T\ (\text{J K}^{-1}\text{mol}^{-1})$.
Minimum temperature at which it will become spontaneous is ________ K. (Integer)

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 : 70819121056 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ایک کیمیائی تعمل $A + B \rightleftharpoons C + D$

$(\Delta_r H^{\ominus} = 80 \text{ kJ mol}^{-1})$

$\Delta_r S^{\ominus}$ انٹروپی درجہ حرارت پر $T(\text{in K})$ پر منحصر ہوتا جبکہ $\Delta_r S^{\ominus} = 2T. (\text{J K}^{-1}\text{mol}^{-1})$

وہ کم سے کم درجہ حرارت جس پر یہ از خود کار ہو جائے K __________ ہے۔ (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 : 54 Question Id : 70819121057 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

224 mL of $SO_{2(g)}$ at 298 K and 1 atm is passed through 100 mL of 0.1 M NaOH solution. The non-volatile solute produced is dissolved in 36 g of water. The lowering of vapour pressure of solution (assuming the solution is dilute) $\left(P^{\circ}_{(H_2O)} = 24 \text{ mm of Hg}\right)$ is $x \times 10^{-2}$ mm of Hg, the value of x is ________. (Integer answer)

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 : 70819121057 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

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298 K اور 1 atm پر 224 mL $SO_{2(g)}$ کو 0.1 M NaOH کے 100 mL سے گذارا گیا تو غیر تغیر پذیر محلل حاصل ہوتا جس کو
36 g پانی میں حل کیا جاتا ہے۔ محلول کو ہلکا یا فرض کرتے ہوئے بھاپ کے دباؤ کی کمی (lowering of vapour pressure) $x \times 10^{-2}$
mm of Hg ہے۔ $\left(P^{\circ}_{(H_2O)} = 24 \text{ mm of Hg}\right)$ ۔ x کی قیمت ________ ہے۔
(قریب ترین 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 : 55 Question Id : 70819121058 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

A homogeneous ideal gaseous reaction $AB_{2(g)} \rightleftharpoons A_{(g)} + 2B_{(g)}$ is carried out in a 25 litre flask at 27°C. The initial amount of AB_2 was 1 mole and the equilibrium pressure was 1.9 atm. The value of K_p is $x \times 10^{-2}$. The value of x is ________. (Integer answer)
$[R = 0.08206 \text{ dm}^3 \text{atm K}^{-1} \text{mol}^{-1}]$

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 : 55 Question Id : 70819121058 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

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27°C پر ایک ہم جنس مثالی گیسی حالت کا تعمل $AB_{2(g)} \rightleftharpoons A_{(g)} + 2B_{(g)}$ کو 25 litre کے فلاسک میں عمل کرایا جاتا ہے AB_2 کا ابتدائی مقدار 1 مول ہے اور متوازن دباؤ 1.9 (atm) فضائی تھا۔ K_p کی قیمت $x \times 10^{-2}$ ہے۔ x کی قیمت ________ ہے۔

$[R = 0.08206\ dm^3 atm\ K^{-1}\ mol^{-1}]$ (قریب ترین عدد)

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 : 70819121059 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Consider the following reaction

$$MnO_4^- + 8H^+ + 5e^- \rightarrow Mn^{+2} + 4H_2O,\ E^o = 1.51\ V.$$

The quantity of electricity required in Faraday to reduce five moles of MnO_4^- is ________.
(Integer answer)

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 : 70819121059 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

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مندرجہ ذیل عمل کو فرض کیجیے :

$$MnO_4^- + 8H^+ + 5e^- \rightarrow Mn^{+2} + 4H_2O,\ E^\circ = 1.51\ V.$$

5 مول MnO_4^- کی تحویل کے لیے درکار برق کی مقدار (فراڈے میں) ________ ہے۔ (قریب ترین عدد)

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 : 70819121060 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

An exothermic reaction $X \rightarrow Y$ has an activation energy 30 kJ mol^{-1}. If energy change ΔE during the reaction is -20 kJ, then the activation energy for the reverse reaction in kJ is ________. (Integer answer)

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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Question Number : 57 Question Id : 70819121060 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ایک حرارت زا تعمل (exothermic reaction) $X \rightarrow Y$ میں کارکردگی کی توانائی 30 kJ mol^{-1} ہے۔ اگر تعمل کے دوران توانائی میں تبدیلی (ΔE) -20 kJ ہے، تو معکوس تعمل میں کارکردگی کی توانائی kJ میں ________ ہے۔ (قریب ترین 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 : 58 Question Id : 70819121061 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

3.12 g of oxygen is adsorbed on 1.2 g of platinum metal. The volume of oxygen adsorbed per gram of the adsorbent at 1 atm and 300 K in L is ________.

$[R = 0.0821 \text{ L atm K}^{-1} \text{ mol}^{-1}]$

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 : 58 Question Id : 70819121061 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

3.12 گرام آکسیجن 1.2 گرام پلاٹینم پر جذب (adsorb) ہوتی ہے۔ adsorbent کے فی گرام پر 1 atm اور 300 K پر آکسیجن کا انجذاب (adsorb) ہونے والا حجم لیٹر میں ________ ہے۔

$[R = 0.0821 \text{ L atm K}^{-1} \text{ mol}^{-1}]$

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 : 59 Question Id : 70819121062 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Dichromate ion is treated with base, the oxidation number of Cr in the product formed 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 : 70819121062 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

ڈائی کرومیٹ آین کو اساس کے ساتھ تعامل کرتے ہیں۔ بننے والے حاصل شدہ (product) میں Cr کا تکسیدی نمبر ________ 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 : 60 Question Id : 70819121063 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Number of bridging CO ligands in $[Mn_2(CO)_{10}]$ 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 : 60 Question Id : 70819121063 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

$[Mn_2(CO)_{10}]$ میں بالترتیب پل لگینڈ (bridging ligands) 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

Mathematics Section A

Section Id :	708191944
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

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Sub-Section Number : 1

Sub-Section Id : 7081911224

Question Shuffling Allowed : Yes

Question Number : 61 Question Id : 70819121064 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If $\vec{a}$ and $\vec{b}$ are perpendicular, then $\vec{a} \times \left(\vec{a} \times \left(\vec{a} \times \left(\vec{a} \times \vec{b}\right)\right)\right)$ is equal to :

Options :

70819168341. $\vec{0}$

70819168342. $\frac{1}{2}\left|\vec{a}\right|^4 \vec{b}$

70819168343. $\left|\vec{a}\right|^4 \vec{b}$

70819168344. $\vec{a} \times \vec{b}$

Question Number : 61 Question Id : 70819121064 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

اگر $\vec{a}$ اور $\vec{b}$ ایک دوسرے پر عمود ہیں تو $\vec{a} \times \left(\vec{a} \times \left(\vec{a} \times \left(\vec{a} \times \vec{b}\right)\right)\right)$ ________ کے برابر ہے۔

Options :

70819168341. $\vec{0}$

70819168342. $\frac{1}{2}\left|\vec{a}\right|^4 \vec{b}$

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70819168343. $\left|\vec{a}\right|^4 \vec{b}$

70819168344. $\vec{a} \times \vec{b}$

Question Number : 62 Question Id : 70819121065 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If (1, 5, 35), (7, 5, 5), (1, λ, 7) and (2λ, 1, 2) are coplanar, then the sum of all possible values of λ is :

Options :

70819168345. $\frac{39}{5}$

70819168346. $-\frac{39}{5}$

70819168347. $-\frac{44}{5}$

70819168348. $\frac{44}{5}$

Question Number : 62 Question Id : 70819121065 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

اگر (1, 5, 35)، (7, 5, 5)، (1, λ, 7) اور (2λ, 1, 2) ہم مستوی (coplanar) ہیں تو λ کے تمام ممکن قیمتوں کا مجموعہ

______ ہے۔

Options :

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70819168345. $\frac{39}{5}$

70819168346. $-\frac{39}{5}$

70819168347. $-\frac{44}{5}$

70819168348. $\frac{44}{5}$

Question Number : 63 Question Id : 70819121066 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The intersection of three lines $x-y=0$, $x+2y=3$ and $2x+y=6$ is a :

Options :

70819168349. Right angled triangle

70819168350. Isosceles triangle

70819168351. Equilateral triangle

70819168352. None of the above

Question Number : 63 Question Id : 70819121066 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

تین خطوط $x-y=0$، $x+2y=3$ اور $2x+y=6$ کا تقطع (intersection) ________ ہے۔

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Options :

70819168349. قائمۃ الزاویہ مثلث

70819168350. مساوی الساقین مثلث

70819168351. مثلث متساوی الاضلاع

70819168352. اوپر میں سے کوئی نہیں

Question Number : 64 Question Id : 70819121067 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of $\begin{vmatrix} (a+1)(a+2) & a+2 & 1 \\ (a+2)(a+3) & a+3 & 1 \\ (a+3)(a+4) & a+4 & 1 \end{vmatrix}$ is :

Options :

70819168353. $(a+1)(a+2)(a+3)$

70819168354. $(a+2)(a+3)(a+4)$

70819168355. -2

70819168356. 0

Question Number : 64 Question Id : 70819121067 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$$\begin{vmatrix} (a+1)(a+2) & a+2 & 1 \\ (a+2)(a+3) & a+3 & 1 \\ (a+3)(a+4) & a+4 & 1 \end{vmatrix}$$ کی قیمت ______ ہے۔

Options :

70819168353. $(a+1)(a+2)(a+3)$

70819168354. $(a+2)(a+3)(a+4)$

70819168355. -2

70819168356. 0

Question Number : 65 Question Id : 70819121068 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The rate of growth of bacteria in a culture is proportional to the number of bacteria present and the bacteria count is 1000 at initial time t=0. The number of bacteria is increased by 20% in 2 hours. If the population of bacteria is 2000 after $\frac{k}{\log_e\left(\frac{6}{5}\right)}$ hours, then $\left(\frac{k}{\log_e 2}\right)^2$ is equal to :

Options :

70819168357. 2

70819168358. 4

70819168359. 8

70819168360. 16

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Question Number : 65 Question Id : 70819121068 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ایک سائنسی مطالعے کے وقت دیکھا گیا کہ بیکٹر یا (bacteria) کی بڑھنے کی شرح (rate of growth) اس کے موجود تعداد کے تناسب (proportional) میں ہے۔ ابتدائی وقت $t=0$ پر بیکٹیریا کی کل تعداد 1000 ہے۔ 2 گھنٹے بعد بیکٹیریا کی تعداد میں 20% کا اضافہ (increased) ہوتا ہے۔ اگر $\frac{k}{\log_e\left(\frac{6}{5}\right)}$ گھنٹے کے بعد بیکٹر یا کی آبادی 2000 ہوتی ہے تو $\left(\frac{k}{\log_e 2}\right)^2$ ______ کے برابر ہے۔

Options :

70819168357. 2

70819168358. 4

70819168359. 8

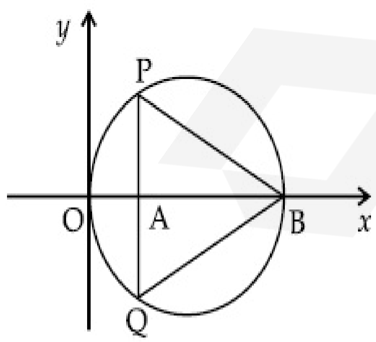
70819168360. 16

Question Number : 66 Question Id : 70819121069 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

In the circle given below, let OA = 1 unit, OB = 13 unit and $PQ \perp OB$. Then, the area of the triangle PQB (in square units) is :



Options :

70819168361. $24\sqrt{2}$

70819168362. $24\sqrt{3}$

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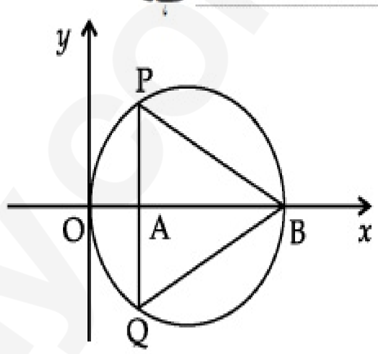
70819168363. $26\sqrt{2}$

70819168364. $26\sqrt{3}$

Question Number : 66 Question Id : 70819121069 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

نیچے دیے ہوئے دائرہ میں فرض کیجئے اکائی $OA = 1$، اکائی $OB = 13$ اور $PQ \perp OB$ تب مثلث PQB کا رقبہ (مربع اکائی میں) ہے۔



Options :

70819168361. $24\sqrt{2}$

70819168362. $24\sqrt{3}$

70819168363. $26\sqrt{2}$

70819168364. $26\sqrt{3}$

Question Number : 67 Question Id : 70819121070 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

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The value of $\lim_{h\to 0} 2\left\{\frac{\sqrt{3}\sin\left(\frac{\pi}{6}+h\right)-\cos\left(\frac{\pi}{6}+h\right)}{\sqrt{3}h\left(\sqrt{3}\cos h-\sin h\right)}\right\}$ is :

Options :

70819168365. $\frac{2}{3}$

70819168366. $\frac{4}{3}$

70819168367. $\frac{2}{\sqrt{3}}$

70819168368. $\frac{3}{4}$

Question Number : 67 Question Id : 70819121070 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\lim_{h\to 0} 2\left\{\frac{\sqrt{3}\sin\left(\frac{\pi}{6}+h\right)-\cos\left(\frac{\pi}{6}+h\right)}{\sqrt{3}h\left(\sqrt{3}\cos h-\sin h\right)}\right\}$ کی قیمت ______ ہے۔

Options :

70819168365. $\frac{2}{3}$

70819168366. $\frac{4}{3}$

70819168367. $\frac{2}{\sqrt{3}}$

70819168368. $\frac{3}{4}$

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Question Number : 68 Question Id : 70819121071 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The maximum slope of the curve $y = \frac{1}{2}x^4 - 5x^3 + 18x^2 - 19x$ occurs at the point :

Options :

70819168369. $(0, 0)$

70819168370. $(2, 2)$

70819168371. $\left(3, \frac{21}{2}\right)$

70819168372. $(2, 9)$

Question Number : 68 Question Id : 70819121071 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

منحنی $y = \frac{1}{2}x^4 - 5x^3 + 18x^2 - 19x$ کی اعظم ڈھلان (maximum slope) ________ نقطہ پر حاصل ہوتی ہے۔

Options :

70819168369. $(0, 0)$

70819168370. $(2, 2)$

70819168371. $\left(3, \frac{21}{2}\right)$

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70819168372. $(2, 9)$

Question Number : 69 Question Id : 70819121072 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of $\int_{-\pi/2}^{\pi/2} \frac{\cos^2 x}{1 + 3^x} dx$ is :

Options :

70819168373. $\frac{\pi}{2}$

70819168374. 2π

70819168375. $\frac{\pi}{4}$

70819168376. 4π

Question Number : 69 Question Id : 70819121072 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\int_{-\pi/2}^{\pi/2} \frac{\cos^2 x}{1 + 3^x} dx$ کی قیمت ______ ہے۔

Options :

70819168373. $\frac{\pi}{2}$

70819168374. 2π

70819168375. $\frac{\pi}{4}$

70819168376. 4π

Question Number : 70 Question Id : 70819121073 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The number of seven digit integers with sum of the digits equal to 10 and formed by using the digits 1, 2 and 3 only is :

Options :

70819168377. 42

70819168378. 35

70819168379. 77

70819168380. 82

Question Number : 70 Question Id : 70819121073 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

1، 2 اور 3 کا استعمال کر کے تیار کیا ہوا 7 ہندسی عدد جس میں ہندسوں کا مجموعہ 10 کے برابر ہے ایسے کل اعداد ________ ہیں۔

Options :

70819168377. 42

70819168378. 35

70819168379.

70819168380. 82

Question Number : 71 Question Id : 70819121074 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The maximum value of the term independent of 't' in the expansion of $\left(tx^{\frac{1}{5}} + \frac{(1-x)^{\frac{1}{10}}}{t}\right)^{10}$ where $x \in (0, 1)$ is :

Options :

70819168381. $\frac{10!}{\sqrt{3}(5!)^2}$

70819168382. $\frac{2.10!}{3\sqrt{3}(5!)^2}$

70819168383. $\frac{2.10!}{3(5!)^2}$

70819168384. $\frac{10!}{3(5!)^2}$

Question Number : 71 Question Id : 70819121074 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

توسیع $\left(tx^{\frac{1}{5}} + \frac{(1-x)^{\frac{1}{10}}}{t}\right)^{10}$ میں 't' سے آزاد رکن (independent of t) کی اعظم قیمت (maximum value)

جہاں پر $x \in (0, 1)$ ہے ______

Options :

70819168381. $\frac{10!}{\sqrt{3}(5!)^2}$

70819168382. $\frac{2.10!}{3\sqrt{3}(5!)^2}$

70819168383. $\frac{2.10!}{3(5!)^2}$

70819168384. $\frac{10!}{3(5!)^2}$

Question Number : 72 Question Id : 70819121075 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let $R = \{(P, Q) \mid P \text{ and } Q \text{ are at the same distance from the origin}\}$ be a relation, then the equivalence class of $(1, -1)$ is the set :

Options :

70819168385. $S = \{(x, y) \mid x^2 + y^2 = 4\}$

70819168386. $S = \{(x, y) \mid x^2 + y^2 = 2\}$

70819168387. $S = \{(x, y) \mid x^2 + y^2 = 1\}$

70819168388. $S = \{(x, y) \mid x^2 + y^2 = \sqrt{2}\}$

Question Number : 72 Question Id : 70819121075 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

فرض کیجئے {R = (P, Q) | P جہاں اور Q مبداء سے یکساں فاصلہ پر ہیں} ایک تعلق ہے تو (1, −1) کے برابری کلاس (equivalence class) سیٹ ہے۔

Options :

70819168385. $S = \{(x, y) \mid x^2 + y^2 = 4\}$

70819168386. $S = \{(x, y) \mid x^2 + y^2 = 2\}$

70819168387. $S = \{(x, y) \mid x^2 + y^2 = 1\}$

70819168388. $S = \{(x, y) \mid x^2 + y^2 = \sqrt{2}\}$

Question Number : 73 Question Id : 70819121076 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let A be a symmetric matrix of order 2 with integer entries. If the sum of the diagonal elements of A^2 is 1, then the possible number of such matrices is :

Options :

70819168389. 1

70819168390. 4

70819168391. 6

70819168392. 12

Question Number : 73 Question Id : 70819121076 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

فرض کیجئے A ایک تشاکل میٹرکس (symmetric matrix) ہے جس کا رتبہ (order) 2 ہے اور ارکان صحیح عدد ہیں۔ اگر A^2 کے وتری ارکان (diagonal elements) کا مجموعہ 1 ہو تو ایسے میٹرکس کی ممکن تعداد ________ ہے۔

Options :

70819168389. 1

70819168390. 4

70819168391. 6

70819168392. 12

Question Number : 74 Question Id : 70819121077 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Let f be any function defined on R and let it satisfy the condition :

$$|f(x)-f(y)| \leq |(x-y)^2|, \forall (x, y) \in \mathbf{R}$$

If $f(0) = 1$, then :

Options :

70819168393. $f(x) > 0, \forall x \in \mathbf{R}$

70819168394. $f(x) < 0, \forall x \in \mathbf{R}$

70819168395. $f(x) = 0, \forall x \in \mathbf{R}$

70819168396. $f(x)$ can take any value in R

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Question Number : 74 Question Id : 70819121077 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

فرض کیجئے 'f' کوئی بھی تفاعل ہے جو $\mathbf{R}$ پر بیان کیا گیا ہے اور فرض کیجئے کہ یہ شرط (condition)

$|f(x) - f(y)| \leq |(x-y)^2|, \forall (x, y) \in \mathbf{R}$ کو مطمئن کرتا ہے۔ اگر $f(0) = 1$ ہو تو __________

Options :

70819168393. $f(x) > 0, \forall x \in \mathbf{R}$

70819168394. $f(x) < 0, \forall x \in \mathbf{R}$

70819168395. $f(x) = 0, \forall x \in \mathbf{R}$

70819168396. $f(x)$ یہ $\mathbf{R}$ کی کوئی بھی قیمت لے سکتا ہے۔

Question Number : 75 Question Id : 70819121078 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

A fair coin is tossed a fixed number of times. If the probability of getting 7 heads is equal to probability of getting 9 heads, then the probability of getting 2 heads is :

Options :

70819168397. $\frac{15}{2^8}$

70819168398. $\frac{15}{2^{12}}$

70819168399. $\frac{15}{2^{13}}$

70819168400. $\frac{15}{2^{14}}$

Question Number : 75 Question Id : 70819121078 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ایک بے نقص سکہ مقرر مرتبہ اچھالا گیا ہے۔ اگر 7 سر (heads) حاصل ہونے کی احتمال 9 سر حاصل ہونے کی احتمال کے برابر ہے تو دو سر (heads) حاصل ہونے کی احتمال ________ ہے۔

Options :

70819168397. $\frac{15}{2^{8}}$

70819168398. $\frac{15}{2^{12}}$

70819168399. $\frac{15}{2^{13}}$

70819168400. $\frac{15}{2^{14}}$

Question Number : 76 Question Id : 70819121079 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

If $\frac{\sin^{-1} x}{a} = \frac{\cos^{-1} x}{b} = \frac{\tan^{-1} y}{c}$; $0 < x < 1$, then the value of $\cos\left(\frac{\pi c}{a+b}\right)$ is :

Options :

70819168401. $1 - y^2$

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70819168402. $\frac{1-y^2}{y\sqrt{y}}$

70819168403. $\frac{1-y^2}{1+y^2}$

70819168404. $\frac{1-y^2}{2y}$

Question Number : 76 Question Id : 70819121079 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

اگر $0<x<1$; $\frac{\sin^{-1}x}{a}=\frac{\cos^{-1}x}{b}=\frac{\tan^{-1}y}{c}$ تو $\cos\left(\frac{\pi c}{a+b}\right)$ کی قیمت ______ ہے۔

Options :

70819168401. $1-y^2$

70819168402. $\frac{1-y^2}{y\sqrt{y}}$

70819168403. $\frac{1-y^2}{1+y^2}$

70819168404. $\frac{1-y^2}{2y}$

Question Number : 77 Question Id : 70819121080 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

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Correct Marks : 4 Wrong Marks : 1

In an increasing geometric series, the sum of the second and the sixth term is $\frac{25}{2}$ and the product of the third and fifth term is 25. Then, the sum of 4^{th}, 6^{th} and 8^{th} terms is equal to :

Options :

70819168405. 26

70819168406. 30

70819168407. 32

70819168408. 35

Question Number : 77 Question Id : 70819121080 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

ایک بڑھتی ہوئی جیومیٹری تسلسل (geometric series) میں دوسرا(second) اور چھٹا (sixth) ارکان کا مجموعہ $\frac{25}{2}$ ہے۔اور تیسرے (third) اور پانچویں (fifth) ارکان کا حاصل ضرب 25 ہے تو چوتھے (4^{th}) ، چھٹے (6^{th}) اور آٹھویں (8^{th}) ارکان کا مجموعہ ________ کے برابر ہے۔

Options :

70819168405. 26

70819168406. 30

70819168407. 32

70819168408. 35

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Question Number : 78 Question Id : 70819121081 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The sum of the infinite series $1 + \frac{2}{3} + \frac{7}{3^2} + \frac{12}{3^3} + \frac{17}{3^4} + \frac{22}{3^5} + \ldots\ldots$ is equal to :

Options :

70819168409. $\frac{9}{4}$

70819168410. $\frac{11}{4}$

70819168411. $\frac{13}{4}$

70819168412. $\frac{15}{4}$

Question Number : 78 Question Id : 70819121081 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

لامحدود تسلسل (infinite series) $1 + \frac{2}{3} + \frac{7}{3^2} + \frac{12}{3^3} + \frac{17}{3^4} + \frac{22}{3^5} + \ldots\ldots$ کا مجموعہ ________ کے برابر ہے۔

Options :

70819168409. $\frac{9}{4}$

70819168410. $\frac{11}{4}$

70819168411. $\frac{13}{4}$

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70819168412. $\frac{15}{4}$

Question Number : 79 Question Id : 70819121082 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

Consider the three planes

$P_1 : 3x + 15y + 21z = 9,$

$P_2 : x - 3y - z = 5,$ and

$P_3 : 2x + 10y + 14z = 5$

Then, which one of the following is true ?

Options :

70819168413. P_1 and P_2 are parallel.

70819168414. P_1 and P_3 are parallel.

70819168415. P_1, P_2 and P_3 all are parallel.

70819168416. P_2 and P_3 are parallel.

Question Number : 79 Question Id : 70819121082 Question Type : MCQ Option Shuffling : Yes

Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

تین مستویوں کو سمجھئے :

$P_1 : 3x + 15y + 21z = 9$

$P_2 : x - 3y - z = 5$

$P_3 : 2x + 10y + 14z = 5$ اور

تو مندرجہ ذیل میں سے کوئی ایک صحیح ہے :

Options :

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70819168413. P_1 اور P_2 متوازی ہیں۔

70819168414. P_1 اور P_3 متوازی ہیں۔

70819168415. P_1, P_2 اور P_3 متوازی ہیں۔

70819168416. P_2 اور P_3 متوازی ہیں۔

Question Number : 80 Question Id : 70819121083 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

The value of $\sum_{n=1}^{100} \int_{n-1}^{n} e^{x-[x]}\, dx$, where $[x]$ is the greatest integer $\leq x$, is :

Options :

70819168417. $100(1-e)$

70819168418. $100(1+e)$

70819168419. $100e$

70819168420. $100(e-1)$

Question Number : 80 Question Id : 70819121083 Question Type : MCQ Option Shuffling : Yes Is Question Mandatory : No

Correct Marks : 4 Wrong Marks : 1

$\sum_{n=1}^{100} \int_{n-1}^{n} e^{x-[x]} \, dx$ کی قیمت ______ ہے۔

جہاں پر $[x]$ یہ سب سے بڑا صحیح عدد $x \leq$ ہے۔

Options :

70819168417. $100(1-e)$

70819168418. $100(1+e)$

70819168419. $100e$

70819168420. $100(e-1)$

Mathematics Section B

Section Id :	708191945
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 :	7081911225
Question Shuffling Allowed :	Yes

Question Number : 81 Question Id : 70819121084 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

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The difference between degree and order of a differential equation that represents the family of curves given by $y^2 = a\left(x + \frac{\sqrt{a}}{2}\right)$, $a > 0$ 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 : 70819121084 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

خاندانی منحنی اس طرح ہے کہ $y^2 = a\left(x + \frac{\sqrt{a}}{2}\right)$, $a > 0$ کے تفریقی مساوات (differential equation) کا

درجہ (degree) اور رتبہ (order) کافرق ________ 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 : 70819121085 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The sum of 162^{th} power of the roots of the equation $x^3 - 2x^2 + 2x - 1 = 0$ 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 : 82 Question Id : 70819121085 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

مساوات $x^3-2x^2+2x-1=0$ کے جذرکا 162^{th} قوت (power) کا مجموعہ ________ 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 : 70819121086 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The area bounded by the lines $y=||x-1|-2|$ 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 : 83 Question Id : 70819121086 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

خطوط $y = ||x-1|-2|$ کے ذریعے گھرے ہوئے علاقہ کا رقبہ ________ 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 : 70819121087 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If $y = y(x)$ is the solution of the equation $e^{\sin y}\cos y\dfrac{dy}{dx} + e^{\sin y}\cos x = \cos x$, $y(0) = 0$; then

$1 + y\left(\frac{\pi}{6}\right) + \frac{\sqrt{3}}{2}y\left(\frac{\pi}{3}\right) + \frac{1}{\sqrt{2}}y\left(\frac{\pi}{4}\right)$ 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 : 70819121087 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

اگر $y = y(x)$ یہ مساوات $e^{\sin y}\cos y\dfrac{dy}{dx} + e^{\sin y}\cos x = \cos x$ ، $y(0) = 0$ کا حل ہے۔ تو

$1 + y\left(\frac{\pi}{6}\right) + \frac{\sqrt{3}}{2}y\left(\frac{\pi}{3}\right) + \frac{1}{\sqrt{2}}y\left(\frac{\pi}{4}\right)$ ________ کے برابر ہے۔

Response Type : Numeric

Evaluation Required For SA : Yes

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Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 85 Question Id : 70819121088 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The number of solutions of the equation $\log_4(x-1)=\log_2(x-3)$ 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 : 70819121088 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

مساوات $\log_4(x-1)=\log_2(x-3)$ کے حل 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

Question Number : 86 Question Id : 70819121089 Question Type : SA

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Correct Marks : 4 Wrong Marks : 0

The number of integral values of 'k' for which the equation $3\sin x + 4\cos x = k + 1$ has a solution, $k \in R$ 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 : 86 Question Id : 70819121089 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

'k' کی تکمیلی قیمت (Integral values) کی تعداد ________ ہے جس کے لئے مساوات $3\sin x + 4\cos x = k + 1$ کا حل $k \in R$ 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 : 70819121090 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let $(\lambda, 2, 1)$ be a point on the plane which passes through the point $(4, -2, 2)$. If the plane is perpendicular to the line joining the points $(-2, -21, 29)$ and $(-1, -16, 23)$, then $\left(\frac{\lambda}{11}\right)^2 - \frac{4\lambda}{11} - 4$ is equal to ________.

Response Type : Numeric

Evaluation Required For SA : Yes

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Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001

Question Number : 87 Question Id : 70819121090 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

فرض کیجئے $(\lambda, 2, 1)$ مستوی پر کوئی ایک نقطہ ہے جو نقطہ $(4, -2, 2)$ سے گذرتی ہے۔ اگر مستوی، نقاط $(-2, -21, 29)$ اور $(-1, -16, 23)$ میں سے گذرنے والے خط پر عمود (perpendicular) ہے تو $\left(\frac{\lambda}{11}\right)^2 - \frac{4\lambda}{11} - 4$ ________ 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 : 88 Question Id : 70819121091 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

The value of the integral $\int_0^{\pi} |\sin 2x|\, dx$ 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

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Question Number : 88 Question Id : 70819121091 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

تکمیل (integral) $\int_{0}^{\pi} |\sin 2x|\, dx$ 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 : 70819121092 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

If $\sqrt{3}(\cos^2 x) = (\sqrt{3} - 1)\cos x + 1$, the number of solutions of the given equation when $x \in \left[0, \frac{\pi}{2}\right]$ 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 : 70819121092 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

اگر $\sqrt{3}(\cos^2 x) = (\sqrt{3} - 1)\cos x + 1$ تو دی ہوئی مساوات کے حل کی تعداد ______ ہے جبکہ $x \in \left[0, \frac{\pi}{2}\right]$.

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 : 90 Question Id : 70819121093 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

Let $m, n \in N$ and $\gcd(2, n) = 1$. If $30\binom{30}{0} + 29\binom{30}{1} + \ldots + 2\binom{30}{28} + 1\binom{30}{29} = n \cdot 2^m$, then

$n + m$ is equal to ________.

$\left(\text{Here } \binom{n}{k} = {}^nC_k\right)$

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 : 90 Question Id : 70819121093 Question Type : SA

Correct Marks : 4 Wrong Marks : 0

فرض کیجیے $(m, n) \in N$ اور $\gcd(2, n) = 1$ اگر $30\binom{30}{0} + 29\binom{30}{1} + \ldots + 2\binom{30}{28} + 1\binom{30}{29} = n \cdot 2^m$ تو

$n + m$ ________ کے برابر ہے۔

(یہاں پر $\binom{n}{k} = {}^nC_k$)

Response Type : Numeric

Evaluation Required For SA : Yes

Show Word Count : Yes

Answers Type : Range

Text Areas : PlainText

Possible Answers :

5 to 5.001