EdLoop

EdLoop EAPCET

PHYSICS · EAPCET (EAMCET)

Rotational Motion

Previous Year Questions with answers

284 questions · **143** papers · **2010–2026** · newest paper first

Step-by-step solutions for every question: free in the EdLoop EAPCET app (Google Play) · pyq.edloop.in

What is in this PDF: every Rotational Motion question we hold from past AP and TS EAPCET (called EAMCET until 2020 in Andhra Pradesh and 2023 in Telangana) papers, with its options and answer. Where an answer comes from a source other than the official final key, it says so next to the answer.

Step-by-step solutions for every question are free in the EdLoop EAPCET app (Google Play) and on app.edloop.in. More chapters: pyq.edloop.in/free-pdfs/

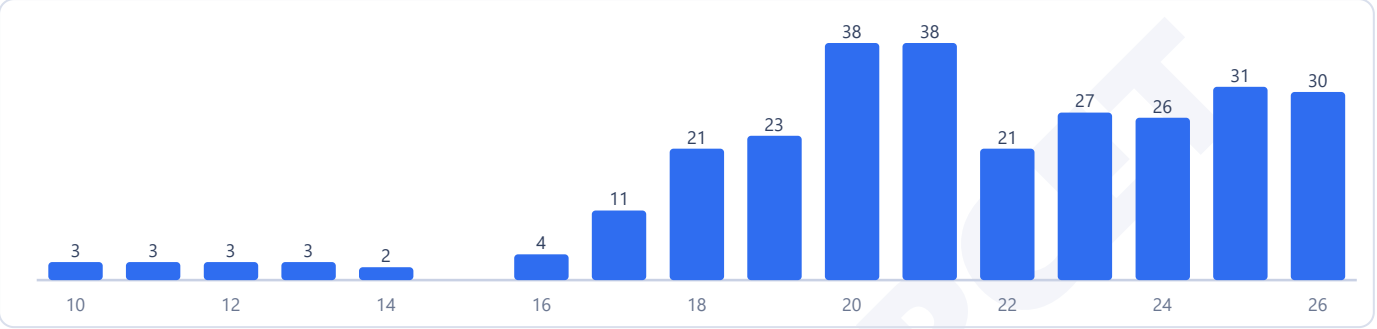
EdLoop EAPCET

Chapter at a glance

4.4%	284	75 of 77	284 / 0
of Physics questions, 2022–2026	questions, 2010–2026	papers asked it, 2022–2026	MCQ / numerical, 2010–2026

Trend. Steady: 1.9 questions per paper in 2024–2026 against 1.5 in 2022–2023.

Questions per year



Counts are the questions we hold: 284 in 143 papers. 2 questions in this chapter came back in more than one paper.

Most-asked topics in this chapter (2010–2026)

Centre of Mass	67
Moment of Inertia	64
Rolling Motion	59
Rotational Dynamics	50
Torque & Angular Momentum	44

How often it comes up

Rotational Motion holds a steady place across state entrance tests in Andhra Pradesh and Telangana. Across the papers we hold from 2022 to 2026, it contributed **135 questions in 77 papers**, which comes out to roughly **1.8 questions per paper**. During this recent five-year stretch, questions from the chapter appeared in 75 of those 77 papers. That places it as the **7th largest of 28 Physics chapters** by share of questions, accounting for 4.4% of all Physics problems asked in that period.

Taking a longer view across the papers we hold from 2010 to 2026, the archive contains 284 questions from 143 of the 149 papers, averaging 1.9 questions per paper and making up 4.8% of the subject. In the earlier testing era from 2010 to 2021, the chapter had a slightly stronger presence at 5.2% of Physics (149 questions in 72 papers). Over the last three exam years from 2024 to 2026, its weight has been 4.7% with 87 questions in 46 papers. Compared to the early years, the chapter's share has fallen, while compared to the full 2022 to 2026 window it has stayed about the same. Every year since 2022 has included problems from this chapter.

Looking at the two states separately between 2022 and 2026, AP EAPCET featured 87 questions across 48 papers (appearing in 47 papers, 1.8 per paper, 4.5% share), while TS EAPCET included 48 questions across 29 papers (appearing in 28 papers, 1.7 per paper, 4.1% share). The chapter is part of the Class 11 Intermediate syllabus and builds heavily on Newtonian dynamics and work-energy principles.

Most-asked topics

In the papers we hold from 2022 to 2026, questions split across five key topic areas:

- **Centre of Mass**: 37 questions. Over the entire 2010 to 2026 archive, this topic accounts for 67 questions and stands as the most frequent question area in recent papers.
- **Moment of Inertia**: 32 questions recently, with 64 questions across the full archive. Standard geometries and axis theorems dominate here.
- **Rolling Motion**: 30 questions recently, and 59 questions across all years in our collection.
- **Torque & Angular Momentum**: 20 questions in the recent window, totalling 44 questions across the complete archive.
- **Rotational Dynamics**: 16 questions in recent papers, and 50 questions across the entire dataset.

Every single one of these five areas appeared in 2026 papers, meaning students cannot afford to overlook any part of the chapter.

What the questions look like

Centre of mass problems frequently test symmetric objects with portions removed. You will encounter square sheets with triangles cut out, circular discs with circular holes, or sets of point masses arranged on the vertices of a polygon. Solving these requires applying mass-weighted coordinate formulas rather than long derivations. Another common variety examines two-body systems subjected to internal gravitational attraction or explosions, where the centre of mass remains unaccelerated because external forces are absent.

Moment of inertia questions focus primarily on thin rods, circular hoops, discs, cylinders, and solid or hollow spheres. Examiners often ask for the moment of inertia about unusual axes, such as a tangent in the plane of a ring or an axis through one corner of a plate, requiring careful application of the parallel axis or perpendicular axis theorems. You will also see composite objects formed by joining or bending rods.

Rolling motion problems usually combine energy conservation with rotational kinematics. Standard set-ups ask for the linear speed or acceleration of a body descending an inclined plane without slipping, or compare which among a ring, disc, and sphere reaches the bottom first.

Rotational dynamics questions involve applying torque equals moment of inertia times angular acceleration. These often feature hanging masses connected to cord-wrapped cylinders, or rotating wheels brought to rest by frictional couples.

How to practise it

Begin by mastering centre of mass calculations for discrete particles and simple composite shapes with cut-outs. Ensure you understand how internal forces do not change the velocity of the centre of mass, as this concept yields quick marks on conceptual questions.

Next, memorize the standard moments of inertia for fundamental bodies like rods, rings, discs, and spheres. Practise using the parallel and perpendicular axis theorems until you can determine the moment of inertia about any given line without hesitation.

Once rotational inertia is solid, move on to torque and angular momentum. Work on conservation of angular momentum problems where a rotating system alters its geometry, such as a person walking on a revolving platform or an object undergoing contraction. Finally, study pure rolling on an incline by relating translational and rotational kinetic energies.

Working through the previous years' questions below year by year will help you become comfortable with the phrasing and style used in the official council papers.

EdLoop EAPCET

Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

A solid cylinder rolls down an incline without slipping. Its acceleration depends on:

(A) Only the mass of the cylinder
(B) Only gravitational acceleration
(C) Both the mass of the cylinder and the angle of inclination
(D) Both the angle of incline and gravitational acceleration

Answer: (D) Both the angle of incline and gravitational acceleration · The council's preliminary key

Q2 AP EAPCET 2026 · 18 May · Shift 1 MCQ

The moment of inertia of a rod about an axis passing through its centre and perpendicular to its length is $\frac{1}{12}ML^2$, where M is the mass and L is the length of the rod. The rod is bent in the middle, so that the two halves make an angle of 60^0. The moment of inertia of the bent rod about the same axis would be

(A) $\frac{1}{12}ML^2$
(B) $\frac{1}{8\sqrt{3}}ML^2$
(C) $\frac{1}{24}ML^2$
(D) $\frac{1}{48}ML^2$

Answer: (A) $\frac{1}{12}ML^2$ · The council's preliminary key

Q3 AP EAPCET 2026 · 18 May · Shift 2 MCQ

Three bodies A, B, and C of masses 2 kg, 3 kg, and 5 kg respectively are projected simultaneously with the same speed from the roof of a tower. The body A is thrown vertically upwards, body B is thrown vertically downwards and body C is projected horizontally. The acceleration of the centre of mass of the system of three bodies is (Acceleration due to gravity $= 10\ \mathrm{m\ s^{-2}}$)

(A) $6\ \mathrm{m\ s^{-2}}$
(B) $10\ \mathrm{m\ s^{-2}}$
(C) $8\ \mathrm{m\ s^{-2}}$
(D) $12\ \mathrm{m\ s^{-2}}$

Answer: (B) $10\ \mathrm{m\ s^{-2}}$ · The council's preliminary key

Q4 AP EAPCET 2026 · 18 May · Shift 2 MCQ

If the moment of inertia of solid sphere of mass 2 kg and radius 10 cm about its tangent is I, then the moment of inertia of a uniform disc of mass 3.5 kg and radius 20 cm about its diameter is

EdLoop EAPCET

(A) 3.75 I
(B) 2.25 I
(C) 1.25 I
(D) 1.75 I

Answer: (C) 1.25 I · The council's preliminary key

Q5 AP EAPCET 2026 · 15 May · Shift 1 MCQ

I_1 represents moment of inertia of a thin, uniform rod about an axis perpendicular to its length and passing through its centre of mass. The same rod is bent into the shape of a ring. If I_2 is moment of inertia of ring about an axis that is tangent to the ring and perpendicular to its plane, then $\frac{I_1}{I_2} =$

(A) $\frac{\pi^2}{6}$
(B) $\frac{\pi}{6}$
(C) $6\pi^2$
(D) 6π

Answer: (A) $\frac{\pi^2}{6}$ · The council's preliminary key

Q6 AP EAPCET 2026 · 15 May · Shift 1 MCQ

A particle is moving in a circular path with constant angular velocity. Its initial angular momentum is L. If the radius of the circle is tripled by keeping angular velocity same, the new angular momentum is

(A) $3L$
(B) $6L$
(C) $9L$
(D) $\frac{L}{3}$

Answer: (C) $9L$ · The council's preliminary key

Q7 AP EAPCET 2026 · 15 May · Shift 2 MCQ

A particle executes uniform circular motion with an angular momentum L. Its kinetic energy is doubled and the angular frequency is halved, then its angular momentum becomes

(A) $2L$
(B) $4L$
(C) $L/2$
(D) $L/4$

Answer: (B) $4L$ · The council's preliminary key

EdLoop EAPCET

Q8 AP EAPCET 2026 · 15 May · Shift 2 MCQ

Two identical particles move towards each other with velocity $2V$ and V respectively. The velocity of center of mass of this system is

(A) V
(B) $\frac{V}{3}$
(C) $\frac{V}{2}$
(D) $\frac{V}{4}$

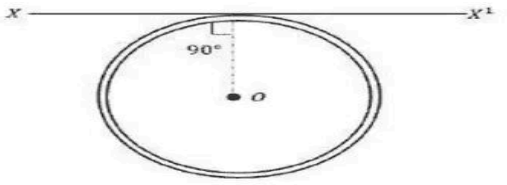
Answer: (C) $\frac{V}{2}$ · The council's preliminary key

Q9 AP EAPCET 2026 · 14 May · Shift 1 MCQ

A thin wire of length L and uniform linear mass density 'ρ' is bent into a circular loop with centre at 'O' as shown. The moment of inertia of the loop about the axis XX^1 is

(see the figure above)

A thin wire of length L and uniform linear mass density 'ρ' is bent into a circular loop with centre at 'O' as shown. The moment of inertia of the loop about the axis XX^1 is



పొడవు L మరియు ఏకరీతి రేఖీయ ద్రవ్యసాంద్రత 'ρ' గల ఒక సన్నని తీగను పటంలో చూపినట్లు 'O' కేంద్రంగా గల వృత్తాకార లూప్ వలె వంచినారు. అయితే, XX^1 అక్షం పరంగా ఈ లూప్ యొక్క జడత్వ భ్రామకం విలువ

Options :

1. $\frac{\rho L^3}{8\pi^2}$
2. $\frac{\rho L^3}{16\pi^2}$
3. $\frac{5\rho L^3}{16\pi^2}$
4. $\frac{3\rho L^3}{8\pi^2}$

(A) $\frac{\rho L^3}{8\pi^2}$
(B) $\frac{\rho L^3}{16\pi^2}$
(C) $\frac{5\rho L^3}{16\pi^2}$
(D) $\frac{3\rho L^3}{8\pi^2}$

Answer: (D) $\frac{3\rho L^3}{8\pi^2}$ · The council's preliminary key

Q10 AP EAPCET 2026 · 14 May · Shift 2 MCQ

The rotational kinetic energy of a solid sphere of mass 3 kg and radius 0.2 m rolling down an inclined plane of height 7m is (nearer to)

(A) 80 J
(B) 36 J
(C) 40 J
(D) 60 J

Answer: (D) 60 J · The council's preliminary key

Q11 AP EAPCET 2026 · 14 May · Shift 2 MCQ

Two particles of masses 4 g and 2 g are separated by a distance of 60 cm. The center of mass of the system of these two particles is

(A) Lies at a distance of 30 cm from 4 g particle
(B) Lies at a distance of 40 cm from 4 g particle
(C) Lies at a distance of 40 cm from 2 g particle
(D) Lies at a distance of 20 cm from 2 g particle

Answer: (C) Lies at a distance of 40 cm from 2 g particle · The council's preliminary key

Q12 AP EAPCET 2026 · 13 May · Shift 1 MCQ

If three particles of masses $2m$, m and $4m$ are moving in three mutually perpendicular directions with velocities $3\ ms^{-1}$, $4\ ms^{-1}$ and $3\ ms^{-1}$ respectively, then the magnitude of the velocity of the center of mass of the system of three particles is

(A) $3.5\ ms^{-1}$
(B) $2\ ms^{-1}$
(C) $2.5\ ms^{-1}$
(D) $3\ ms^{-1}$

Answer: (B) $2\ ms^{-1}$ · The council's preliminary key

Q13 AP EAPCET 2026 · 13 May · Shift 1 MCQ

The acceleration of a uniform disc rolling down an inclined plane of length 1.75 m is 1/3 times the acceleration due to gravity. If a solid sphere is rolling down from the top of the same inclined plane, then the velocity with which it reaches the bottom of the plane is

EdLoop EAPCET

(A) $2.5\ ms^{-1}$

(B) $5\ ms^{-1}$

(C) $3.5\ ms^{-1}$

(D) $7\ ms^{-1}$

Answer: (C) $3.5\ ms^{-1}$ · The council's preliminary key

Q14 AP EAPCET 2026 · 13 May · Shift 2 MCQ

Two particles A and B initially at rest move towards each other under a mutual force of attraction. At the instant, the speed of A is V and the speed of B is 2V, find the speed of centre of mass of the system, if the masses of A and B are in the ratio of 2 : 1

(A) Zero

(B) $\frac{4V}{3}$

(C) $\frac{3V}{4}$

(D) $\frac{3V}{2}$

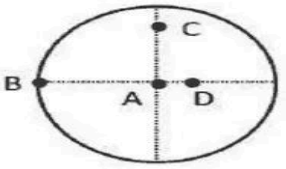
Answer: (A) Zero · The council's preliminary key

Q15 AP EAPCET 2026 · 13 May · Shift 2 MCQ

The moment of Inertia of a uniform circular disc is maximum about an axis perpendicular to the disc and passing through which of the following points?

(see the figure above)

The moment of Inertia of a uniform circular disc is maximum about an axis perpendicular to the disc and passing through which of the following points?



పటంలో చూపిన ఏకరీతి వృత్తాకార బిళ్ళ తలానికి లంబంగా వుంటూ ఏ బిందువు గుండా పోయే అక్షం పరంగా దానికి గరిష్ఠ జడత్వ భ్రామకం వుంటుంది?

Options :

1. B
2. C
3. D
4. A

(A) B
(B) C
(C) D
(D) A

Answer: (A) B · The council's preliminary key

Q16 AP EAPCET 2026 · 12 May · Shift 1 MCQ

A body A is projected with a velocity of $40\ ms^{-1}$ at an angle of 60^0 with the horizontal. At some other time, another body B is thrown vertically upwards with a velocity of $40\sqrt{3}\ \mathrm{ms}^{-1}$ such that it collides body A at a height of 60 m. If the velocity of centre of mass of the system of the two bodies after collision is $20\ ms^{-1}$, then the ratio of the masses of the bodies A and B is (Acceleration due to gravity = $10\ ms^{-2}$)

(A) 1:3
(B) 1:2
(C) 4:1
(D) 3:2

Answer: (C) 4:1 · The council's preliminary key

Q17 AP EAPCET 2026 · 12 May · Shift 1 MCQ

A ring of mass 1.5 kg and radius 35 cm is rolling without slipping on a horizontal floor. If the translational kinetic energy of the ring is 100 J, then its rotational kinetic energy is

(A) 150 J
(B) 50 J
(C) 100 J
(D) 200 J

Answer: (C) 100 J · The council's preliminary key

Q18 AP EAPCET 2026 · 12 May · Shift 2 MCQ

A torque 'T' produces angular acceleration α in a circular disc. If radius of disc is doubled keeping the mass constant, angular acceleration becomes

(A) α
(B) $\alpha/2$
(C) $\alpha/4$
(D) 4α

Answer: (C) $\alpha/4$ · The council's preliminary key

Q19 AP EAPCET 2026 · 12 May · Shift 2 MCQ

Hollow sphere rolls on an inclined plane of height h without slipping. If it starts from rest, its speed at the bottom is

(A) $\sqrt{2gh}$
(B) $\sqrt{\frac{10gh}{7}}$
(C) $\sqrt{\frac{6gh}{5}}$
(D) $\sqrt{\frac{4gh}{3}}$

Answer: (C) $\sqrt{\frac{6gh}{5}}$ · The council's preliminary key

Q20 TS EAPCET 2026 · 11 May · Shift 1 MCQ

A body P of mass 3 kg at rest is dropped from a height of 250 m from the ground. At the same moment another body Q of mass 2 kg is thrown vertically upwards from the ground with a velocity of $50\ \text{ms}^{-1}$. Both the bodies travel along the same straight line in opposite directions. The velocity of body Q when the centre of mass of the system of the bodies P and Q reaches the maximum height is (Acceleration due to gravity $= 10\ \text{ms}^{-2}$)

(A) $25\ \text{ms}^{-1}$
(B) $30\ \text{ms}^{-1}$
(C) $40\ \text{ms}^{-1}$
(D) $20\ \text{ms}^{-1}$

Answer: (B) $30\ \text{ms}^{-1}$ · The council's preliminary key

Q21 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If the kinetic energy of a solid sphere when it rolls without slipping is 700 J, then its kinetic energy when it slips without rolling with same velocity is

(A) 700 J
(B) 500 J
(C) 300 J
(D) 400 J

Answer: (B) 500 J · The council's preliminary key

Q22 TS EAPCET 2026 · 11 May · Shift 2 MCQ

Two solid spheres of radii 10 cm and 5 cm are in contact with each other. If the density of the material of the smaller sphere is twice the density of the material of the larger sphere, then the distance of the centre of mass of the system of the two spheres from the centre of the smaller sphere is

EdLoop EAPCET

(A) 6 cm
(B) 9 cm
(C) 12 cm
(D) 8 cm

Answer: (C) 12 cm · The council's preliminary key

Q23 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If a solid sphere of mass $2\ \mathrm{kg}$ is rolling without slipping on a surface with a velocity of $10\ \mathrm{ms}^{-1}$, then the total kinetic energy of the sphere is

(A) $70\ \mathrm{J}$
(B) $140\ \mathrm{J}$
(C) $280\ \mathrm{J}$
(D) $350\ \mathrm{J}$

Answer: (B) $140\ \mathrm{J}$ · The council's preliminary key

Q24 TS EAPCET 2026 · 10 May · Shift 1 MCQ

Four particles P, Q, R and S of masses m, m, m and 2m respectively are kept at the four corners of a square of side $\sqrt{2}\,\mathrm{m}$. The distance of centre of mass of the system of particles from the particle S is

(A) 1.2 m
(B) 0.8 m
(C) 0.6 m
(D) 0.4 m

Answer: (B) 0.8 m · The council's preliminary key

Q25 TS EAPCET 2026 · 10 May · Shift 1 MCQ

A wire of length L and mass 100 g is bent in the form of a circular ring. If the moment of inertia of the ring about its diameter is $98 \times 10^{-5}\ \mathrm{kg\,m^2}$, then the value of L is

(A) 176 cm
(B) 88 cm
(C) 44 cm
(D) 22 cm

Answer: (B) 88 cm · The council's preliminary key

Q26 TS EAPCET 2026 · 10 May · Shift 2 MCQ

Two bodies A and B of masses 2 kg and 3 kg respectively are moving along the same straight line such that the linear momentum of body A is greater than the linear momentum of body B. The velocity of centre of mass of the system of the two bodies when they are moving in the same

EdLoop EAPCET

direction is 9 times the velocity of centre of mass when they are moving in opposite directions. The ratio of the velocities of the bodies A and B is

(A) $15 : 8$
(B) $8 : 15$
(C) $3 : 7$
(D) $7 : 3$

Answer: (A) $15 : 8$ · The council's preliminary key

Q27 TS EAPCET 2026 · 10 May · Shift 2 MCQ

The radius of gyration of a solid sphere of mass M and radius R about its diameter is K. The radius of gyration of a uniform circular disc of mass 2M and radius $\frac{R}{2}$ about its diameter is

(A) $\frac{4K}{\sqrt{5}}$
(B) $\frac{K\sqrt{5}}{4}$
(C) $\frac{K\sqrt{10}}{8}$
(D) $\frac{8K}{\sqrt{10}}$

Answer: (C) $\frac{K\sqrt{10}}{8}$ · The council's preliminary key

Q28 TS EAPCET 2026 · 9 May · Shift 1 MCQ

The shift (in metre) in center of mass when the largest possible equilateral triangular plate is removed from a uniform square plate of side 2 m with one of their sides coinciding is

(A) $\left[\frac{\sqrt{3}-4}{\sqrt{3}-2}\right]$
(B) $\frac{(\sqrt{3}-1)}{(4-\sqrt{3})}$
(C) $\frac{2-\sqrt{3}}{4-\sqrt{3}}$
(D) $\frac{\sqrt{3}-1}{\sqrt{3}-4}$

Answer: (B) $\frac{(\sqrt{3}-1)}{(4-\sqrt{3})}$ · The council's preliminary key

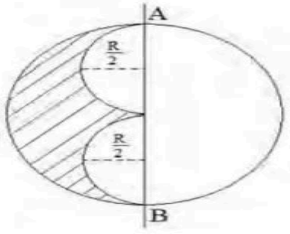
Q29 TS EAPCET 2026 · 9 May · Shift 1 MCQ

A uniform thin circular disc of mass M and radius R is shown in the figure. The moment of inertia of the shaded region about the diameter AB of the disc is

(see the figure above)

EdLoop EAPCET

A uniform thin circular disc of mass M and radius R is shown in the figure. The moment of inertia of the shaded region about the diameter AB of the disc is
ద్రవ్యరాశి M మరియు వ్యాసార్ధం R గల ఒక ఏకరీతి పలుచని వృత్తాకార బిళ్ళ పటంలో చూపబడింది. ఆ బిళ్ళ వ్యాసం AB పరంగా ఛాయ ఉన్న ప్రాంతం యొక్క జడత్వ భ్రామకం



Options :

1. $\frac{7MR^2}{16}$
2. $\frac{7MR^2}{64}$
3. $\frac{7MR^2}{32}$
4. $\frac{MR^2}{16}$

(A) $\frac{7MR^2}{16}$
(B) $\frac{7MR^2}{64}$
(C) $\frac{7MR^2}{32}$
(D) $\frac{MR^2}{16}$

Answer: (B) $\frac{7MR^2}{64}$ · The council's preliminary key

Q30 TS EAPCET 2026 · 9 May · Shift 2 MCQ

A solid sphere rolls down without slipping on an inclined plane of angle of inclination 30°. If the angle of inclination of the plane is increased to 45°, then the percentage increase in the acceleration of the sphere is nearly

(A) 73.2
(B) 41.4
(C) 21.2
(D) 36.6

Answer: (B) 41.4 · The council's preliminary key

Q31 AP EAPCET 2025 · 27 May · Shift 1 MCQ

Two bodies of masses M and 4M initially at rest, start moving towards each other due to their mutual attraction. The velocity of their centre of mass when the first body attains a velocity v_0 is

(A) zero
(B) $-v_0$
(C) $2v_0$
(D) $-4v_0$

Answer: (A) zero · The council's preliminary key

Q32 AP EAPCET 2025 · 27 May · Shift 1 MCQ

The angular velocity of a body changes from 6 rad s^{-1} to 21 rad s^{-1} in a time of 1.5 s. If the moment of inertia of the body is 100 g m^2, then the rate of change of angular momentum of the body is

(A) 0.12 N m
(B) 0.6 N m
(C) 1 N m
(D) 0.8 N m

Answer: (C) 1 N m · The council's preliminary key

Q33 AP EAPCET 2025 · 26 May · Shift 1 MCQ

The moment of inertia of a solid cylinder of mass 2.5 kg and radius 10 cm about its axis is

(A) $0.0725\ \mathrm{kg\,m^2}$
(B) $12500\ \mathrm{kg\,m^2}$
(C) $0.0125\ \mathrm{kg\,m^2}$
(D) $72500\ \mathrm{kg\,m^2}$

Answer: (C) $0.0125\ \mathrm{kg\,m^2}$ · The council's preliminary key

Q34 AP EAPCET 2025 · 26 May · Shift 1 MCQ

A body of mass 2 kg is moving towards north with a velocity of 20 m s^{-1} and another body of mass 3 kg is moving towards east with a velocity of 10 m s^{-1}. The magnitude of the velocity of the centre of mass of the system of the two bodies is

(A) $20\ \mathrm{m\ s^{-1}}$
(B) $10\ \mathrm{m\ s^{-1}}$
(C) $15\ \mathrm{m\ s^{-1}}$
(D) $2\sqrt{5}\ \mathrm{m\ s^{-1}}$

Answer: (B) $10\ \mathrm{m\ s^{-1}}$ · The council's preliminary key

Q35 AP EAPCET 2025 · 26 May · Shift 2 MCQ

A circular disc of diameter 0.8 m and mass 4 kg is rolling on a smooth horizontal plane. If 2.56 N m torque is acting on the disc, then its angular acceleration is

(A) 8 rad s^{-2}
(B) 4 rad s^{-2}
(C) 2 rad s^{-2}
(D) 16 rad s^{-2}

Answer: (A) 8 rad s^{-2} · The council's preliminary key

Q36 AP EAPCET 2025 · 26 May · Shift 2 MCQ

A solid sphere and a solid cylinder have same mass and same radius. The ratio of the moment of inertia of the solid sphere about its diameter and the moment of inertia of the solid cylinder about its axis is

(A) $3:5$
(B) $4:5$
(C) $3:1$
(D) $2:1$

Answer: (B) $4:5$ · The council's preliminary key

Q37 AP EAPCET 2025 · 24 May · Shift 1 MCQ

If a solid sphere is rolling without slipping on a horizontal plane, then the ratio of its rotational and total kinetic energies is

(A) $2:5$
(B) $2:7$
(C) $4:3$
(D) $1:2$

Answer: (B) $2:7$ · The council's preliminary key

Q38 AP EAPCET 2025 · 24 May · Shift 1 MCQ

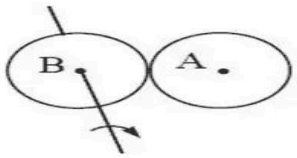
As shown in the figure, two thin coplanar circular discs A and B each of mass 'M' and radius 'r' are attached to form a rigid body. The moment of inertia of this system about an axis perpendicular to the plane of disc B and passing through its centre is

(see the figure above)

EdLoop EAPCET

As shown in the figure, two thin coplanar circular discs A and B each of mass 'M' and radius 'r' are attached to form a rigid body. The moment of inertia of this system about an axis perpendicular to the plane of disc B and passing through its centre is

పటంలో చూపిన విధంగా ఒక్కొక్కటి 'M' ద్రవ్యరాశి, 'r' వ్యాసార్ధం గల A మరియు B అనే రెండు పలుచని ఏకతలీయ వృత్తాకార బిళ్ళలను కలిపి దృఢ వస్తువుగా మలిచారు. వృత్తాకార బిళ్ళ B కేంద్రం ద్వారా పోతూ దాని తలానికి లంబంగా గల అక్షం పరంగా ఈ వ్యవస్థ యొక్క జడత్వ భ్రామకం



Options :

1. $2Mr^2$
2. $3Mr^2$
3. $4Mr^2$
4. $5Mr^2$

(A) $2Mr^2$
(B) $3Mr^2$
(C) $4Mr^2$
(D) $5Mr^2$

Answer: (D) $5Mr^2$ · The council's preliminary key

Q39 AP EAPCET 2025 · 23 May · Shift 1 MCQ

Radius of gyration of a thin uniform rod of length 'L' about an axis passing through its centre and perpendicular to its length is

(A) $\frac{L}{\sqrt{12}}$
(B) $\frac{L}{12}$
(C) $L\sqrt{12}$
(D) $12L$

Answer: (A) $\frac{L}{\sqrt{12}}$ · The council's preliminary key

Q40 AP EAPCET 2025 · 23 May · Shift 1 MCQ

A thin circular ring and a circular disc of equal mass are rolling without sliding. If their linear velocities are equal and the total kinetic energy of the disc is 6 J, then the total kinetic energy of the ring is

(A) 6 J
(B) 3 J
(C) 8 J
(D) 4 J

Answer: (C) 8 J · The council's preliminary key

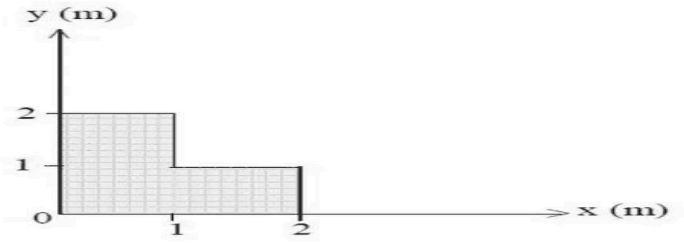
Q41 AP EAPCET 2025 · 23 May · Shift 2 MCQ

The coordinates of the centre of mass of a uniform L shaped plate of mass 3 kg shown in the figure is

(see the figure above)

The coordinates of the centre of mass of a uniform L shaped plate of mass 3 kg shown in the figure is

పటంలో చూపిన 3 kg ద్రవ్యరాశి ఉన్న L ఆకారంలో గల ఒక ఏకరీతి పలక యొక్క ద్రవ్యరాశి కేంద్రం నిరూపకాలు



Options :

1. $\left(\frac{5}{6}\,\mathrm{m}, \frac{5}{6}\,\mathrm{m}\right)$
2. $\left(\frac{3}{2}\,\mathrm{m}, \frac{3}{2}\,\mathrm{m}\right)$
3. $\left(\frac{1}{2}\,\mathrm{m}, \frac{1}{2}\,\mathrm{m}\right)$
4. $\left(\frac{6}{5}\,\mathrm{m}, \frac{6}{5}\,\mathrm{m}\right)$

(A) $\left(\frac{5}{6}\,\mathrm{m}, \frac{5}{6}\,\mathrm{m}\right)$
(B) $\left(\frac{3}{2}\,\mathrm{m}, \frac{3}{2}\,\mathrm{m}\right)$
(C) $\left(\frac{1}{2}\,\mathrm{m}, \frac{1}{2}\,\mathrm{m}\right)$
(D) $\left(\frac{6}{5}\,\mathrm{m}, \frac{6}{5}\,\mathrm{m}\right)$

Answer: (A) $\left(\frac{5}{6}\,\mathrm{m}, \frac{5}{6}\,\mathrm{m}\right)$ · The council's preliminary key

Q42 AP EAPCET 2025 · 23 May · Shift 2 MCQ

A circular disc of mass 20 kg and radius 1 m is rotating about an axis passing through its center and perpendicular to its plane with an angular velocity of $2\ \mathrm{rad\ s^{-1}}$. Then the rotational kinetic energy of the disc is

(A) 100 J
(B) 50 J
(C) 75 J
(D) 20 J

Answer: (D) 20 J · The council's preliminary key

Q43 AP EAPCET 2025 · 22 May · Shift 1 MCQ

A thin uniform circular disc rolls with a constant velocity without slipping on a horizontal surface. Its total kinetic energy is

(A) three times its rotational kinetic energy
(B) three times its translational kinetic energy
(C) one and half times its rotational kinetic energy
(D) twice its translational kinetic energy

Answer: (A) three times its rotational kinetic energy · The council's preliminary key

Q44 AP EAPCET 2025 · 22 May · Shift 1 MCQ

Three thin uniform rods each of mass M and length L are placed along the three axes of a cartesian coordinate system with one end of all the rods at origin. The moment of inertia of the system of the rods about z-axis is

(A) $\frac{ML^2}{3}$
(B) $\frac{2ML^2}{3}$
(C) $\frac{ML^2}{2}$
(D) ML^2

Answer: (B) $\frac{2ML^2}{3}$ · The council's preliminary key

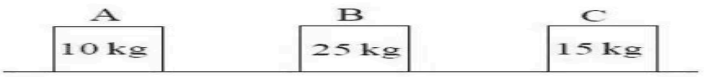
Q45 AP EAPCET 2025 · 22 May · Shift 2 MCQ

Three blocks A, B and C are arranged as shown in the figure such that the distance between two successive blocks is 10 m. Block A is displaced towards block B by 2 m and block C is displaced towards block B by 3 m. The distance through which the block B should be moved so that the centre of mass of the system does not change is

(see the figure above)

Three blocks A, B and C are arranged as shown in the figure such that the distance between two successive blocks is 10 m. Block A is displaced towards block B by 2 m and block C is displaced towards block B by 3 m. The distance through which the block B should be moved so that the centre of mass of the system does not change is

పటంలో చూపిన విధంగా A, B మరియు C అనే మూడు దిమ్మెలను, రెండు ప్రక్క ప్రక్క దిమ్మెల మధ్య దూరం 10 m ఉండే విధంగా అమర్చారు. దిమ్మె A ను దిమ్మె B వైపుకు 2 m జరిపి దిమ్మె C ను దిమ్మె B వైపుకు 3 m జరిపారు. వ్యవస్థ ద్రవ్యరాశి కేంద్రం మారకుండా వుండడానికి, దిమ్మె B ను కదల్చవలసిన దూరం



Options :

1. 1.4 m, towards block C
   1.4 m, దిమ్మె C వైపు
2. 1.5 m, towards block A
   1.5 m, దిమ్మె A వైపు
3. 2 m, towards block A
   2 m, దిమ్మె A వైపు
4. 1 m, towards block C
   1 m, దిమ్మె C వైపు

(A) 1.4 m, towards block C

(B) 1.5 m, towards block A

(C) 2 m, towards block A

(D) 1 m, towards block C

Answer: (D) 1 m, towards block C · The council's preliminary key

Q46 AP EAPCET 2025 · 22 May · Shift 2 MCQ

A solid sphere of mass $4\ \mathrm{kg}$ and radius $28\ \mathrm{cm}$ is on an inclined plane. If the acceleration of the sphere when it rolls down without sliding is $3.5\ \mathrm{m\,s^{-2}}$, then the acceleration of the sphere when it slides down without rolling is

(A) $2.5\ \mathrm{m\,s^{-2}}$

(B) $3.5\ \mathrm{m\,s^{-2}}$

(C) $1.7\ \mathrm{m\,s^{-2}}$

(D) $4.9\ \mathrm{m\,s^{-2}}$

Answer: (D) $4.9\ \mathrm{m\,s^{-2}}$ · The council's preliminary key

Q47 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If the radius of gyration of a thin circular ring about an axis passing through its centre and perpendicular to its plane is $10\sqrt{2}$ cm, then its radius of gyration about its diameter is

(A) 10 cm
(B) 20 cm
(C) $10\sqrt{2}$ cm
(D) $20\sqrt{2}$ cm

Answer: (A) 10 cm · The council's preliminary key

Q48 AP EAPCET 2025 · 21 May · Shift 1 MCQ

If a wheel starting from rest is rotating with an angular acceleration of π rad s^{-2}, then the number of rotations made by the wheel in the first 6 seconds time is

(A) 36
(B) 9
(C) 18
(D) 12

Answer: (B) 9 · The council's preliminary key

Q49 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If two bodies of masses $2\ \mathrm{kg}$ and $3\ \mathrm{kg}$ are moving at right angles with velocities $20\ \mathrm{m\,s^{-1}}$ and $10\ \mathrm{m\,s^{-1}}$ respectively, then the velocity of the centre of mass of the system of the two bodies is

(A) $5\ \mathrm{m\,s^{-1}}$
(B) $30\ \mathrm{m\,s^{-1}}$
(C) $10\ \mathrm{m\,s^{-1}}$
(D) $14\ \mathrm{m\,s^{-1}}$

Answer: (C) $10\ \mathrm{m\,s^{-1}}$ · The council's preliminary key

Q50 TS EAPCET 2025 · 4 May · Shift 1 MCQ

A thin uniform wire of mass 'm' and linear density 'ρ' is bent in the form of a circular ring. The moment of inertia of the ring about a tangent parallel to its diameter is

(A) $\frac{3m^3}{8\pi^2\rho^2}$
(B) $\frac{8m^3}{3\pi^2\rho^2}$
(C) $\frac{8\pi^2m^3}{3\rho^2}$
(D) $\frac{3\pi^2m^3}{8\rho^2}$

Answer: (A) $\frac{3m^3}{8\pi^2\rho^2}$ · The council's preliminary key

Q51 TS EAPCET 2025 · 4 May · Shift 1 MCQ

A solid sphere and a thin uniform circular disc of same radius are rolling down an inclined plane without slipping. If the acceleration of the sphere is $3\ \mathrm{ms^{-2}}$, then the acceleration of the disc is

(A) $4\ \mathrm{ms}^{-2}$
(B) $2.8\ \mathrm{ms}^{-2}$
(C) $3\ \mathrm{ms}^{-2}$
(D) $3.2\ \mathrm{ms}^{-2}$

Answer: (B) $2.8\ \mathrm{ms}^{-2}$ · The council's preliminary key

Q52 TS EAPCET 2025 · 4 May · Shift 2 MCQ

A solid sphere of mass 2 kg and radius 0.5 m is rolling without slipping on a horizontal surface. The ratio of the rotational and translational kinetic energies of the sphere is

(A) $3:5$
(B) $2:5$
(C) $4:5$
(D) $7:5$

Answer: (B) $2:5$ · The council's preliminary key

Q53 TS EAPCET 2025 · 4 May · Shift 2 MCQ

If the length of a thin uniform rod is 'L' and the radius of gyration of the rod about an axis perpendicular to its length and passing through one end is K, then K : L =

(A) $1:\sqrt{3}$
(B) $1:\sqrt{2}$
(C) $1:3$
(D) $1:2$

Answer: (A) $1:\sqrt{3}$ · The council's preliminary key

Q54 TS EAPCET 2025 · 3 May · Shift 1 MCQ

A thin uniform circular disc of mass $\frac{10}{\pi^2}$ kg and radius 2 m is rotating about an axis passing through its centre and perpendicular to its plane. The work done to increase the angular speed of the disc from 90 rev/min to 120 rev/min is

(A) 35 J
(B) 70 J
(C) 140 J
(D) 210 J

Answer: (B) 70 J · The council's preliminary key

Q55 TS EAPCET 2025 · 3 May · Shift 1 MCQ

A solid cylinder of mass 2 kg, length 40 cm and radius 10 cm is placed in contact with a solid sphere of mass 0.5 kg and radius 10 cm such that the centres of the two bodies lie along the geometrical axis

of the cylinder. The distance of the centre of mass of the system of two bodies from the centre of the sphere is

(A) 27 cm
(B) 15 cm
(C) 24 cm
(D) 18 cm

Answer: (C) 24 cm · The council's preliminary key

Q56 TS EAPCET 2025 · 3 May · Shift 2 MCQ

A balance is made using a uniform metre scale of mass 100 g and two plates each of mass 200 g fixed at the two ends of the scale and the balance is pivoted at 45 cm mark of the scale. The error when 300 g weight is placed in the plate at 0 cm to weigh vegetables placed in the plate at 100 cm is

(A) 36.4 g
(B) 63.6 g
(C) 200 g
(D) 100 g

Answer: (D) 100 g · The council's preliminary key

Q57 TS EAPCET 2025 · 3 May · Shift 2 MCQ

The ratio of radii of gyration of a thin circular ring and a circular disc of same radius about a tangential axis in their own planes is $\sqrt{12} : \sqrt{K}$. The value of K is

(A) 10
(B) 24
(C) 5
(D) 12

Answer: (A) 10 · The council's preliminary key

Q58 TS EAPCET 2025 · 2 May · Shift 1 MCQ

If the moment of inertia of a uniform solid cylinder about the axis of the cylinder is $\frac{1}{n}$ times its moment of inertia about an axis passing through its midpoint and perpendicular to its length, then the ratio of the length and radius of the cylinder is

(A) $\sqrt{2(3n+1)}$
(B) $\sqrt{2(3n-1)}$
(C) $\sqrt{3(2n+1)}$
(D) $\sqrt{3(2n-1)}$

Answer: (D) $\sqrt{3(2n-1)}$ · The council's preliminary key

Q59 TS EAPCET 2025 · 2 May · Shift 1 MCQ

Two blocks of masses in the ratio $m : n$ are connected by a light inextensible string passing over a frictionless fixed pulley. If the system of the blocks is released from rest, then the acceleration of the centre of mass of the system of the blocks is
(g - acceleration due to gravity)

(A) $\left(\frac{m+n}{m-n}\right)^2 g$
(B) $\left(\frac{m-n}{m+n}\right)^2 g$
(C) $\left(\frac{m+n}{m-n}\right) g$
(D) $\left(\frac{m-n}{m+n}\right) g$

Answer: (B) $\left(\frac{m-n}{m+n}\right)^2 g$ · The council's preliminary key

Q60 TS EAPCET 2025 · 2 May · Shift 2 MCQ

Due to global warming, if the ice in the polar region melts and some of this water flows to the equatorial region, then

(A) Angular momentum of the earth increases and duration of day increases
(B) Angular momentum of the earth decreases and duration of day decreases
(C) Angular momentum of the earth is constant and duration of day decreases
(D) Angular momentum of the earth is constant and duration of day increases

Answer: (D) Angular momentum of the earth is constant and duration of day increases · The council's preliminary key

Q61 TS EAPCET 2025 · 2 May · Shift 2 MCQ

If the moment of inertia of a thin circular ring about an axis passing through its edge and perpendicular to its plane is I, then the moment of inertia of the ring about its diameter is

(A) $\frac{I}{4}$
(B) $4I$
(C) $\frac{I}{2}$
(D) $2I$

Answer: (A) $\frac{I}{4}$ · The council's preliminary key

Q62 AP EAPCET 2024 · 23 May · Shift 1 MCQ

The moment of inertia of a solid sphere about its diameter is $20\ \mathrm{kg\,m^2}$. The moment of inertia of a thin spherical shell having the same mass and radius about its diameter is

(A) $16.6\ \mathrm{kg\,m^2}$
(B) $30.3\ \mathrm{kg\,m^2}$
(C) $33.3\ \mathrm{kg\,m^2}$
(D) $66.6\ \mathrm{kg\,m^2}$

Answer: (C) $33.3\ \mathrm{kg\,m^2}$ · The council's preliminary key

Q63 AP EAPCET 2024 · 23 May · Shift 1 MCQ

One ring, one solid sphere and one solid cylinder are rolling down on same inclined plane starting from rest. The radius of all the three are equal. The object reaches down with maximum velocity is

(A) Solid cylinder
(B) Solid sphere
(C) Ring
(D) Solid sphere and Ring

Answer: (B) Solid sphere · The council's preliminary key

Q64 AP EAPCET 2024 · 23 May · Shift 1 MCQ

A uniform metal solid sphere is rotating with angular speed ω_0 about diameter. If the temperature is raised by 50 °C, the angular speed will be

[given $\alpha_{\text{metal}} = 20 \times 10^{-5}\ ^\circ\mathrm{C}^{-1}$]

(A) $0.95\ \omega_0$
(B) $0.96\ \omega_0$
(C) $0.98\ \omega_0$
(D) ω_0 (Angular velocity is same)

Answer: (C) $0.98\ \omega_0$ · The council's preliminary key

Q65 AP EAPCET 2024 · 22 May · Shift 1 MCQ

The moment of inertia of a rod about an axis passing through its centre and perpendicular to its length is $\frac{1}{12}ML^2$, where M is the mass and L is the length of the rod. The rod is bent in the middle so that the two halves make an angle of 60°. The moment of inertia of the bent rod about the same axis would be

(A) $\frac{1}{48}ML^2$
(B) $\frac{1}{12}ML^2$
(C) $\frac{1}{24}ML^2$
(D) $\frac{1}{8\sqrt{3}}ML^2$

Answer: (B) $\frac{1}{12}ML^2$ · The council's preliminary key

Q66 AP EAPCET 2024 · 22 May · Shift 1 MCQ

A uniform rod of length '2L' is placed with one end in contact with the earth and is then inclined at an angle α to the horizontal and allowed to fall without slipping at contact point. When it becomes horizontal, its angular velocity will be

(A) $\sqrt{\frac{3g\sin\alpha}{2L}}$
(B) $\sqrt{\frac{2L}{3g\sin\alpha}}$
(C) $\sqrt{\frac{6g\sin\alpha}{L}}$
(D) $\sqrt{\frac{L}{g\sin\alpha}}$

Answer: (A) $\sqrt{\frac{3g\sin\alpha}{2L}}$ · The council's preliminary key

Q67 AP EAPCET 2024 · 22 May · Shift 2 MCQ

A ring and a disc of same mass and same diameter are rolling without slipping. Their linear velocities are same, then the ratio of their kinetic energy is

(A) 0.75
(B) 1.33
(C) 0.5
(D) 2.66

Answer: (B) 1.33 · The council's preliminary key

Q68 AP EAPCET 2024 · 21 May · Shift 1 MCQ

The masses of a solid cylinder and a hollow cylinder are 3.2 kg and 1.6 kg respectively. Both the solid cylinder and hollow cylinder start from rest from the top of an inclined plane and roll down without slipping. If both the cylinders have equal radius and the acceleration of the solid cylinder is $4\ \mathrm{ms}^{-2}$, the acceleration of the hollow cylinder is

(A) $2\ \mathrm{ms}^{-2}$
(B) $9\ \mathrm{ms}^{-2}$
(C) $6\ \mathrm{ms}^{-2}$
(D) $3\ \mathrm{ms}^{-2}$

Answer: (D) $3\ \mathrm{ms}^{-2}$ · The council's preliminary key

Q69 AP EAPCET 2024 · 21 May · Shift 1 MCQ

A solid sphere of mass 50 kg and radius 20 cm is rotating about its diameter with an angular velocity of 420 rpm. The angular momentum of the sphere is

(A) 8.8 Js
(B) 70.4 Js
(C) 17.6 Js
(D) 35.2 Js

Answer: (D) 35.2 Js · The council's preliminary key

Q70 AP EAPCET 2024 · 21 May · Shift 2 MCQ

A solid cylinder rolls down on an inclined plane of height 'h' and inclination 'θ'. The speed of the cylinder at the bottom is

(A) $\sqrt{\frac{gh}{2}}$
(B) $\sqrt{\frac{3gh}{2}}$
(C) $\sqrt{2gh}$
(D) $\sqrt{\frac{4gh}{3}}$

Answer: (D) $\sqrt{\frac{4gh}{3}}$ · The council's preliminary key

Q71 AP EAPCET 2024 · 21 May · Shift 2 MCQ

Three particles of each mass 'm' are kept at the three vertices of an equilateral triangle of side 'l'. The moment of inertia of system of the particles about any side of the triangle is

(A) $\frac{ml^2}{4}$
(B) ml^2
(C) $\frac{3}{4}ml^2$
(D) $\frac{2}{3}ml^2$

Answer: (C) $\frac{3}{4}ml^2$ · The council's preliminary key

Q72 AP EAPCET 2024 · 20 May · Shift 1 MCQ

The moment of inertia of a solid sphere of mass 20 kg and diameter 20 cm about the tangent to the sphere is

(A) $0.24\ \text{kgm}^2$
(B) $0.14\ \text{kgm}^2$
(C) $0.28\ \text{kgm}^2$
(D) $0.08\ \text{kgm}^2$

Answer: (C) $0.28\ \text{kgm}^2$ · The council's preliminary key

Q73 AP EAPCET 2024 · 20 May · Shift 1 MCQ

A wooden plank of mass 90 kg and length 3.3 m is floating on still water. A girl of mass 20 Kg walks from one end to the other end of the plank. The distance through which the plank moves is

(A) 30 cm
(B) 40 cm
(C) 80 cm
(D) 60 cm

Answer: (D) 60 cm · The council's preliminary key

Q74 AP EAPCET 2024 · 19 May · Shift 2 MCQ

A solid cylinder rolls down an inclined plane without slipping. If the translational kinetic energy of the cylinder is 140 J, the total kinetic energy of the cylinder is

(A) 105 J
(B) 70 J
(C) 210 J
(D) 280 J

Answer: (C) 210 J · The council's preliminary key

Q75 AP EAPCET 2024 · 19 May · Shift 2 MCQ

Two blocks of masses m and $2m$ are connected by a massless string which passes over a fixed frictionless pulley. If the system of blocks is released from rest, the speed of the centre of mass of the system of two blocks after a time of 5.4 s is

(Acceleration due to gravity = $10\ \mathrm{ms}^{-2}$)

(A) $6\ \mathrm{ms}^{-1}$
(B) $8\ \mathrm{ms}^{-1}$
(C) $4\ \mathrm{ms}^{-1}$
(D) $12\ \mathrm{ms}^{-1}$

Answer: (A) $6\ \mathrm{ms}^{-1}$ · The council's preliminary key

Q76 AP EAPCET 2024 · 18 May · Shift 1 MCQ

The moments of inertia of a solid cylinder and a hollow cylinder of same mass and same radius about the axes of the cylinders are I_1 and I_2. The relation between I_1 and I_2 is

(A) $I_1 < I_2$
(B) $I_1 = I_2$
(C) $I_1 > I_2$
(D) $I_1 = I_2 = 0$

Answer: (A) $I_1 < I_2$ · The council's preliminary key

Q77 AP EAPCET 2024 · 18 May · Shift 1 MCQ

A wheel of angular speed 600 rev/min is made to slow down at a rate of 2 rad s^{-2}. The number of revolutions made by the wheel before coming to rest is

(A) 157
(B) 314
(C) 177
(D) 117

Answer: (A) 157 · The council's preliminary key

Q78 TS EAPCET 2024 · 11 May · Shift 1 MCQ

A metre scale is balanced on a knife edge at its centre. When two coins, each of mass 9 g are kept one above the other at the 10 cm mark, the scale is found to be balanced at 35 cm. The mass of the metre scale is

(A) 15 g
(B) 30 g
(C) 45 g
(D) 60 g

Answer: (B) 30 g · The council's preliminary key

Q79 TS EAPCET 2024 · 11 May · Shift 1 MCQ

A body of mass 'm' and radius 'r' rolling horizontally with a velocity 'V', rolls up an inclined plane to a vertical height $\frac{V^2}{g}$. The body is

(A) a sphere
(B) a circular disc
(C) a circular ring
(D) a solid cylinder

Answer: (C) a circular ring · The council's preliminary key

Q80 TS EAPCET 2024 · 10 May · Shift 1 MCQ

An alphabet 'T' made of two similar thin uniform metal plates of each length 'L' and width 'a' is placed on a horizontal surface as shown in the figure. If the alphabet is vertically inverted, the shift in the

position of its centre of mass from the horizontal surface is

(see the figure above)

An alphabet 'T' made of two similar thin uniform metal plates of each length 'L' and width 'a' is placed on a horizontal surface as shown in the figure. If the alphabet is vertically inverted, the shift in the position of its centre of mass from the horizontal surface is

ఒక్కొక్కటి 'L' పొడవు మరియు 'a' వెడల్పు గల రెండు ఒకే రకమైన సన్నని ఏకరీతి లోహపు పలకలచే తయారు చేయబడిన 'T' అను అక్షరం పటంలో చూపిన విధంగా ఒక క్షితిజ సమాంతర తలంపై ఉంచబడినది. అక్షరంను తలక్రిందులుగా చేసిన, క్షితిజ సమాంతర తలం నుండి దాని ద్రవ్యరాశి కేంద్రం స్థితిలోని మార్పు



Options :

1. $\frac{L-a}{2}$
2. $\frac{a-L}{2}$
3. $L-\frac{a}{2}$
4. $\frac{L}{2}-a$

(A) $\frac{L-a}{2}$
(B) $\frac{a-L}{2}$
(C) $L-\frac{a}{2}$
(D) $\frac{L}{2}-a$

Answer: (A) $\frac{L-a}{2}$ · The council's preliminary key

Q81 TS EAPCET 2024 · 10 May · Shift 1 MCQ

A solid sphere and a disc of same mass 'M' and radius 'R' are kept such that their curved surfaces are in contact and their centers lie along the same horizontal line. The moment of inertia of the two body system about an axis passing through their point of contact and perpendicular to the plane of the disc is

(A) $\frac{53MR^2}{20}$
(B) $\frac{39MR^2}{10}$
(C) $\frac{29MR^2}{10}$
(D) $\frac{9MR^2}{10}$

Answer: (C) $\frac{29MR^2}{10}$ · The council's preliminary key

Q82 TS EAPCET 2024 · 10 May · Shift 2 MCQ

A circular plate of radius r is removed from a uniform circular plate P of radius 4r to form a hole. If the distance between the centre of the hole formed and the centre of the plate P is 2r, then the distance of the centre of mass of the remaining portion from the centre of the plate P is

(A) $\frac{r}{3}$
(B) $\frac{r}{15}$
(C) $\frac{2r}{15}$
(D) $2r$

Answer: (C) $\frac{2r}{15}$ · The council's preliminary key

Q83 TS EAPCET 2024 · 10 May · Shift 2 MCQ

A hollow cylinder and a solid cylinder initially at rest at the top of an inclined plane are rolling down without slipping. If the time taken by the hollow cylinder to reach the bottom of the inclined plane is 2 s, the time taken by the solid cylinder to reach the bottom of the inclined plane is

(A) 2 s
(B) 1.414 s
(C) 1 s
(D) 1.732 s

Answer: (D) 1.732 s · The council's preliminary key

Q84 TS EAPCET 2024 · 9 May · Shift 1 MCQ

A solid sphere rolls down without slipping from the top of an inclined plane of height 28 m and angle of inclination 30°. The velocity of the sphere, when it reaches the bottom of the plane is

(Acceleration due to gravity $= 10\ \text{ms}^{-2}$)

(A) $20\ \text{ms}^{-1}$
(B) $28\ \text{ms}^{-1}$
(C) $10\ \text{ms}^{-1}$
(D) $14\ \text{ms}^{-1}$

Answer: (A) $20\ \text{ms}^{-1}$ · The council's preliminary key

Q85 TS EAPCET 2024 · 9 May · Shift 1 MCQ

Four identical particles each of mass 'm' are kept at the four corners of a square of side 'a'. If one of the particles is removed, the shift in the position of the centre of mass is

(A) $\sqrt{2}\,a$
(B) $\frac{3a}{\sqrt{2}}$
(C) $\frac{a}{\sqrt{2}}$
(D) $\frac{a}{3\sqrt{2}}$

Answer: (D) $\frac{a}{3\sqrt{2}}$ · The council's preliminary key

Q86 TS EAPCET 2024 · 9 May · Shift 2 MCQ

A thin uniform wire of mass 'm' and linear mass density 'ρ' is bent in the form of a circular loop. The moment of inertia of the loop about its diameter is

(A) $\frac{m^2}{4\pi^2\rho^2}$
(B) $\frac{m^3}{4\rho^2}$
(C) $\frac{m^3}{8\pi^2\rho^2}$
(D) $\frac{m^3}{8\rho^2}$

Answer: (C) $\frac{m^3}{8\pi^2\rho^2}$ · The council's preliminary key

Q87 TS EAPCET 2024 · 9 May · Shift 2 MCQ

Three particles A, B and C of masses m, 2m and 3m are moving towards north, south and east respectively. If the velocities of the particles A, B and C are $6\ \text{ms}^{-1}$, $12\ \text{ms}^{-1}$ and $8\ \text{ms}^{-1}$ respectively, then the velocity of the centre of mass of the system of particles is

(A) $7\ \text{ms}^{-1}$
(B) $5\ \text{ms}^{-1}$
(C) $26\ \text{ms}^{-1}$
(D) $8\ \text{ms}^{-1}$

Answer: (B) $5\ \text{ms}^{-1}$ · The council's preliminary key

Q88 AP EAPCET 2023 · 19 May · Shift 1 MCQ

A solid sphere of mass 2 kg is rolling without slipping on a horizontal surface with a velocity $5\ \text{ms}^{-1}$. The rotational kinetic energy of the sphere is

(A) 25 J
(B) 12.5 J
(C) 10 J
(D) 20 J

Answer: (C) 10 J · The council's preliminary key

Q89 AP EAPCET 2023 · 19 May · Shift 1 MCQ

A solid sphere and a solid cylinder roll down without slipping along an inclined plane. If they start from rest from the top of the inclined plane, the ratio of the velocities of the solid sphere and solid cylinder when they reach the bottom of the inclined plane is

(A) $\sqrt{25} : \sqrt{21}$
(B) $\sqrt{3} : \sqrt{2}$
(C) $\sqrt{25} : \sqrt{14}$
(D) $\sqrt{15} : \sqrt{14}$

Answer: (D) $\sqrt{15} : \sqrt{14}$ · The council's preliminary key

Q90 AP EAPCET 2023 · 18 May · Shift 1 MCQ

Which of the following statements regarding centre of mass is NOT true?

(A) For two particles of equal mass, the centre of mass lies exactly midway between them
(B) For three non-linear particles of equal mass, the centre of mass coincides with the centroid of the triangle formed by the particles
(C) When the total external force on a system is zero, the velocity of the centre of mass of the system remains constant.
(D) For two particles of different masses, the centre of mass of the particles is nearer to the particle of lesser mass.

Answer: (D) For two particles of different masses, the centre of mass of the particles is nearer to the particle of lesser mass. · The council's preliminary key

Q91 AP EAPCET 2023 · 18 May · Shift 1 MCQ

A particle of mass $10\ \mathrm{g}$ is moving towards east with a velocity of $10\ \mathrm{ms}^{-1}$ and another particle of mass $15\ \mathrm{g}$ is moving towards north with a velocity of $5\ \mathrm{ms}^{-1}$. The magnitude of the velocity of the centre of mass of the system of the two particles is

(A) $5\ \mathrm{ms}^{-1}$
(B) $10\ \mathrm{ms}^{-1}$
(C) $15\ \mathrm{ms}^{-1}$
(D) $7.5\ \mathrm{ms}^{-1}$

Answer: (A) $5\ \mathrm{ms}^{-1}$ · The council's preliminary key

Q92 AP EAPCET 2023 · 18 May · Shift 2 MCQ

Two bodies of masses 12 kg and 6 kg are projected simultaneously with velocities $15\ \mathrm{ms}^{-1}$ and $20\ \mathrm{ms}^{-1}$ respectively from the top of a tower of height 25 m. The body of mass 12 kg is projected vertically upwards and the body of mass 6 kg is projected horizontally. The maximum height reached by the centre of mass of the system of two bodies from the ground

$(g = 10\ \mathrm{ms}^{-2})$

(A) 5 m
(B) 25 m
(C) 30 m
(D) 50 m

Answer: (C) 30 m · The council's preliminary key

Q93 AP EAPCET 2023 · 17 May · Shift 1 MCQ

A body rotating with uniform acceleration about its geometrical axis makes 8 rotations in the first 2 seconds. The number of rotations the body makes in the next 3 seconds is

(Initially the body is at rest)

(A) 50
(B) 25
(C) 42
(D) 21

Answer: (C) 42 · The council's preliminary key

Q94 AP EAPCET 2023 · 17 May · Shift 1 MCQ

A solid sphere is pushed on a horizontal surface such that it slides with a speed $3.5\ \mathrm{ms}^{-1}$ initially without rolling. The sphere will start rolling without slipping when its velocity becomes

(A) $2.5\ \mathrm{ms}^{-1}$
(B) $5\ \mathrm{ms}^{-1}$
(C) $3.5\ \mathrm{ms}^{-1}$
(D) $7\ \mathrm{ms}^{-1}$

Answer: (A) $2.5\ \mathrm{ms}^{-1}$ · The council's preliminary key

Q95 AP EAPCET 2023 · 17 May · Shift 2 MCQ

A spherical portion A of radius R is removed from a solid sphere B of radius 2R such that the centre of the removed portion is same as the centre of the sphere B. The ratio of the moments of inertia of the remaining spherical shell and the solid sphere B about the axes passing through their diameters is

(A) $31 : 32$
(B) $7 : 8$
(C) $15 : 16$
(D) $4 : 7$

Answer: (A) $31 : 32$ · The council's preliminary key

Q96 AP EAPCET 2023 · 17 May · Shift 2 MCQ

A circular disc of moment of inertia $3.5\ \mathrm{kg\,m^2}$ is rotating with angular speed $30\ \mathrm{rad\,s^{-1}}$ about an axis passing through its centre and perpendicular to its plane. The torque required to stop the disc in 5 seconds is

(A) 84 Nm
(B) 42 Nm
(C) 10.5 Nm
(D) 21 Nm

Answer: (D) 21 Nm · The council's preliminary key

Q97 AP EAPCET 2023 · 16 May · Shift 1 MCQ

A circular plate A of radius $1.5r$ is removed from one edge of a uniform circular plate B of radius $2r$. The distance of centre of mass of the remaining portion from the centre of the plate B is

(A) $\frac{5r}{12}$
(B) $\frac{9r}{14}$
(C) $\frac{3r}{4}$
(D) $\frac{7r}{8}$

Answer: (B) $\frac{9r}{14}$ · The council's preliminary key

Q98 AP EAPCET 2023 · 16 May · Shift 1 MCQ

The angular momentum of a solid cylinder rotating about its geometric axis with angular speed $40\ \mathrm{rad\ s^{-1}}$ is $2\ \mathrm{kg\ m^2\ s^{-1}}$. If the radius of the cylinder is 10 cm, the mass of the cylinder is

(A) 2 kg
(B) 5 kg
(C) 8 kg
(D) 10 kg

Answer: (D) 10 kg · The council's preliminary key

Q99 AP EAPCET 2023 · 16 May · Shift 2 MCQ

Three particles of each mass 'm' are kept at the three vertices of an equilateral triangle. If I_1 is the moment of inertia of the system of the particles about an axis along one side of the triangle and I_2 is the moment of inertia of the system of the particles about an axis along the perpendicular bisector of a side, then $I_1 : I_2$ is

(A) $\sqrt{3} : 2$
(B) $\sqrt{3} : 4$
(C) $3 : 4$
(D) $3 : 2$

Answer: (D) $3 : 2$ · The council's preliminary key

Q100 AP EAPCET 2023 · 16 May · Shift 2 MCQ

Two particles of masses $1\ \mathrm{g}$ and $2\ \mathrm{g}$ move towards each other with velocities $10\ \mathrm{ms}^{-1}$ and $20\ \mathrm{ms}^{-1}$ respectively. The velocity of the centre of mass of the system of the two particles is

(A) $5\ \mathrm{ms}^{-1}$
(B) $10\ \mathrm{ms}^{-1}$
(C) $15\ \mathrm{ms}^{-1}$
(D) $20\ \mathrm{ms}^{-1}$

Answer: (B) $10\ \mathrm{ms}^{-1}$ · The council's preliminary key

Q101 AP EAPCET 2023 · 15 May · Shift 1 MCQ

A force of $(2\hat{i} + 3\hat{j} + 4\hat{k})\ \mathrm{N}$ acts on a particle whose position vector with respect to the origin of the coordinate system is $(6\hat{i} + b\hat{j} + 12\hat{k})\ \mathrm{m}$. If the angular momentum of the body is constant, the value of 'b' is

(A) 6
(B) 9
(C) 12
(D) 3

Answer: (B) 9 · The council's preliminary key

Q102 AP EAPCET 2023 · 15 May · Shift 1 MCQ

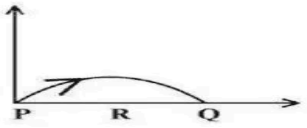
The range of a projectile of weight W is R. The average torque on the projectile between the initial and final positions P and Q about the point of projection is

(see the figure above)

EdLoop EAPCET

The range of a projectile of weight W is R. The average torque on the projectile between the initial and final positions P and Q about the point of projection is

W భారం గల ఒక ప్రక్షేపకం వ్యాప్తి R. ప్రక్షేపక బిందువు పరంగా తొలి మరియు తుది బిందువులు P మరియు Q ల మధ్య పని చేసే సగటు టార్క్



Options :

1. $\frac{WR}{2}$
2. $\frac{WR}{3}$
3. $\frac{WR}{4}$
4. WR

(A) $\frac{WR}{2}$
(B) $\frac{WR}{3}$
(C) $\frac{WR}{4}$
(D) WR

Answer: (A) $\frac{WR}{2}$ · The council's preliminary key

Q103 AP EAPCET 2023 · 15 May · Shift 2 MCQ

Two particles of masses 5 g and 3 g are separated by a distance of 40 cm. The centre of mass of the system of these two particles

(A) lies at a distance of 15 cm from 5 g particle
(B) lies at a distance of 25 cm from 5 g particle
(C) lies at a distance of 10 cm from 3 g particle
(D) lies at the mid point of the line joining the two particles

Answer: (A) lies at a distance of 15 cm from 5 g particle · The council's preliminary key

Q104 AP EAPCET 2023 · 15 May · Shift 2 MCQ

The angular speed of a rigid body rotating about a fixed axis is $(8 - 2t)$ rad s^{-1}. The angle through which the body rotates before it comes to rest is

(A) 8 rad
(B) 12 rad
(C) 16 rad
(D) 20 rad

Answer: (C) 16 rad · The council's preliminary key

Q105 TS EAMCET 2023 · 14 May · Shift 1 MCQ

The ratio of the radii of two solid spheres of same mass is 2:3. The ratio of the moments of inertia of the spheres about their diameters is

(A) 4:9
(B) 2:3
(C) 8:27
(D) 16:81

Answer: (A) 4:9 · The council's preliminary key

Q106 TS EAMCET 2023 · 14 May · Shift 2 MCQ

A constant torque acting on a uniform circular wheel changes its angular momentum from A_0 to $4A_0$ in 4 seconds. The magnitude of the torque is

(A) $\frac{3A_0}{4}$
(B) A_0
(C) $4A_0$
(D) $12A_0$

Answer: (A) $\frac{3A_0}{4}$ · The council's preliminary key

Q107 TS EAMCET 2023 · 14 May · Shift 2 MCQ

A particle performs uniform circular motion with an angular momentum L. If the frequency of the particle's motion is doubled and its kinetic energy is halved, then its angular momentum becomes

(A) $2L$
(B) $4L$
(C) $\frac{L}{2}$
(D) $\frac{L}{4}$

Answer: (D) $\frac{L}{4}$ · The council's preliminary key

Q108 TS EAMCET 2023 · 13 May · Shift 1 MCQ

A body is rolling without slipping on a horizontal plane. If the rotational kinetic energy of the body is 50 % of its total kinetic energy, then the body is

EdLoop EAPCET

(A) Hollow sphere
(B) Solid sphere
(C) Solid cylinder
(D) Thin circular ring

Answer: (D) Thin circular ring · The council's preliminary key

Q109 TS EAMCET 2023 · 13 May · Shift 2 MCQ

Two blocks of masses 2 kg and 1 kg are tied to the ends of a string which passes over a light frictionless pulley. The blocks are held at rest at the same horizontal level and then released suddenly. The distance traversed by their centre of mass in 2 seconds is

(acceleration due to gravity = $10\ \mathrm{ms}^{-2}$)

(A) 1.42 m
(B) 2.22 m
(C) 3.12 m
(D) 3.33 m

Answer: (B) 2.22 m · The council's preliminary key

Q110 TS EAMCET 2023 · 13 May · Shift 2 MCQ

A particle of mass 'm' is moving along a line $y = x + a$ with a constant velocity 'v'. The angular momentum of the particle about the origin is

(A) mva
(B) $mva\sqrt{2}$
(C) $\frac{mva}{\sqrt{2}}$
(D) $\frac{mva}{x\sqrt{2}}$

Answer: (C) $\frac{mva}{\sqrt{2}}$ · The council's preliminary key

Q111 TS EAMCET 2023 · 12 May · Shift 1 MCQ

A system consists of two particles of masses m_1 and m_2. If the particle of mass m_1 is moved towards the centre of mass through a distance d, then the distance the second particle should be moved, so as to keep the centre of mass at the same position is

(A) $-\frac{m_2}{m_1}d$
(B) $\frac{m_2}{m_1+m_2}d$
(C) $-\frac{m_1}{m_2}d$
(D) $\frac{m_1}{m_2}d$

Options (3) or (4) were accepted. More than one answer was accepted. · The council's preliminary key

Q112 TS EAMCET 2023 · 12 May · Shift 1 MCQ

If the radius of the earth becomes x times its present value, the new period of rotation in hours is

(A) $6x^2$
(B) $12x^2$
(C) $24x^2$
(D) $48x^2$

Answer: (C) $24x^2$ · The council's preliminary key

Q113 TS EAMCET 2023 · 12 May · Shift 2 MCQ

Moon revolves around the earth in an orbit of radius R with time period of revolution T. It also rotates about its own axis with a time period T. If mass of the moon is M and its radius is 'r', the total kinetic energy of the moon is

(A) $\frac{2M\pi^2R^2}{T^2}+\frac{4Mr^2\pi^2}{5T^2}$
(B) $\frac{M\pi^2R^2}{2T^2}$
(C) $\frac{4Mr^2\pi^2}{5T^2}$
(D) $\frac{M\pi^2R^2}{2T^2}+\frac{4Mr^2\pi^2}{5T^2}$

Answer: (A) $\frac{2M\pi^2R^2}{T^2}+\frac{4Mr^2\pi^2}{5T^2}$ · The council's preliminary key

Q114 TS EAMCET 2023 · 12 May · Shift 2 MCQ

The spinning of the Diwali cracker 'ground chakkar' involves the concept of

(A) Conservation of mechanical energy
(B) Conservation of linear momentum
(C) Conservation of angular momentum
(D) Conservation of charge

Answer: (C) Conservation of angular momentum · The council's preliminary key

Q115 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

A solid spherical ball is rolled up an inclined plane of angle of inclination 30° with an initial speed of 4 m/s at the bottom of the inclination. How far will the ball go up the plane. (Use g = 10 m/s^2)

(A) 56 cm
(B) 112 cm
(C) 225 cm
(D) 120 cm

Answer: (C) 225 cm · Checked by our team

EdLoop EAPCET

Q116 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

A wheel of radius with 0.5 m and a moment of inertia of 10 kg.m^2 is rotating freely at an angular speed of 70 rev/min. The wheel can be stopped in 5.0 s by pressing a wet cloth against the rim and exerting a radially inward force of 88 N. The coefficient of kinetic friction between the wheel and wet cloth is

(A) 0.17
(B) 0.33
(C) 0.40
(D) 0.60

Answer: (B) 0.33 · The council's preliminary key

Q117 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

A metre stick is balanced on a knife edge at its centre. When four coins, each of mass 2g are put one on top of the other at 10.0 cm mark, the stick it found to be balanced at 46.0 cm mark. The mass of the metre stick is

(A) 66 g
(B) 60 g
(C) 72 g
(D) 18 g

Answer: (C) 72 g · The council's preliminary key

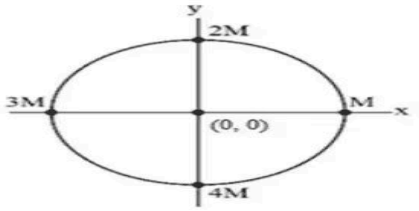
Q118 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

Four masses are arranged along a circle of radius 1 m as shown in the figure. The center of mass of this system of masses is at

(see the figure above)

EdLoop EAPCET

Four masses are arranged along a circle of radius 1 m as shown in the figure. The center of mass of this system of masses is at



Options :

1. $-\frac{1}{5}\hat{i}-\frac{1}{5}\hat{j}$

2. $\frac{1}{5}\hat{i}+\hat{j}$

3. $\hat{i}-\frac{1}{5}\hat{j}$

4. $\frac{1}{5}\hat{i}+\frac{1}{5}\hat{j}$

(A) $-\frac{1}{5}\hat{i}-\frac{1}{5}\hat{j}$

(B) $\frac{1}{5}\hat{i}+\hat{j}$

(C) $\hat{i}-\frac{1}{5}\hat{j}$

(D) $\frac{1}{5}\hat{i}+\frac{1}{5}\hat{j}$

Answer: (A) $-\frac{1}{5}\hat{i}-\frac{1}{5}\hat{j}$ · The council's preliminary key

Q119 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

A solid cylinder of mass m and radius R rolls down an inclined plane of height 30 m without slipping. The speed of its centre of mass when the cylinder reaches the bottom is
[use g = 10 m/s^2]

(A) 10 m/s

(B) 20 m/s

(C) 30 m/s

(D) 40 m/s

Answer: (B) 20 m/s · The council's preliminary key

Q120 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

A body is located at $(1, 1, 1)$ m and experiences a force of 2 N in the direction $\hat{i}+\hat{j}$. The torque acting on the body in N-m is

(A) $(-\sqrt{2}\,\hat{i}+\sqrt{2}\,\hat{j})$
(B) $(-\hat{i}+\hat{j})$
(C) $(\hat{i}-\hat{j})$
(D) $(\sqrt{2}\,\hat{i}+\sqrt{2}\,\hat{j})$

Answer: (A) $(-\sqrt{2}\,\hat{i}+\sqrt{2}\,\hat{j})$ · The council's preliminary key

Q121 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

The moment of inertia of a thin uniform rectangular plate of mass 'm', having length 'a' and width 'b' about an axis perpendicular to the plane of the plate and passing through one of its vertices is

(A) $\frac{2}{3}mab$
(B) $\frac{1}{3}mab$
(C) $\frac{2}{3}m\left(a^2+b^2\right)$
(D) $\frac{1}{3}m\left(a^2+b^2\right)$

Answer: (D) $\frac{1}{3}m\left(a^2+b^2\right)$ · The council's preliminary key

Q122 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

A circular portion of radius R_2 has been removed from one edge of a circular disc of radius R_1. The correct expression for the centre of mass for the remaining portion of the disc is

(A) $-\dfrac{R_2^2}{R_1+R_2}$
(B) $-\dfrac{R_2^2}{R_1-R_2}$
(C) $\dfrac{R_2^2}{R_1+R_2}$
(D) $-\dfrac{R_1^2}{R_1+R_2}$

Answer: (A) $-\dfrac{R_2^2}{R_1+R_2}$ · The council's preliminary key

Q123 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

If the earth suddenly shrinks to $\dfrac{1}{64}$ of its original volume, while keeping the same mass, then the duration of the day will be [Assume earth is a perfect sphere]

(A) 24 hours
(B) 1.5 hours
(C) 16 hours
(D) 48 hours

Answer: (B) 1.5 hours · The council's preliminary key

Q124 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

A wheel is rotating freely at some angular speed. A second wheel initially at rest and with thrice the rotational inertia of the first, is suddenly coupled to the first wheel. The fraction of the original rotational kinetic energy lost is

(A) 0.50
(B) 0.25
(C) 0.66
(D) 0.75

Answer: (D) 0.75 · The council's preliminary key

Q125 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

A uniform rod of length 60 cm is placed with one end in contact with the horizontal table and is then inclined at an angle 30° to the horizontal and allowed to fall. The angular velocity of the rod when it becomes horizontal is
(acceleration due to gravity = $10\ \mathrm{m\,s^{-2}}$)

(A) $9\ \mathrm{rad\,s^{-1}}$
(B) $6\ \mathrm{rad\,s^{-1}}$
(C) $5\ \mathrm{rad\,s^{-1}}$
(D) $8\ \mathrm{rad\,s^{-1}}$

Answer: (C) $5\ \mathrm{rad\,s^{-1}}$ · The council's preliminary key

Q126 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

A wheel undergoes a constant acceleration starting form (sic) rest at t = 0. The angular velocity of the wheel is $3.14\ \frac{\mathrm{rad}}{\mathrm{sec}}$ when t = 2 s. The accelerator is abruptly ceased at t = 20 s. The number of revolutions, wheel makes in the interval t = 0 to t = 40 s is

(A) 100
(B) 175
(C) 225
(D) 150

Answer: (D) 150 · The council's preliminary key

Q127 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

A fan is rotating with an angular speed 300 rpm. The fan is switched off, and it takes 80 s to come to rest. Assuming constant angular deceleration, the number of revolutions made by the fan before it comes to rest is

EdLoop EAPCET

(A) 400
(B) 200
(C) 300
(D) 314

Answer: (B) 200 · The council's preliminary key

Q128 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

Masses m, $\left(\frac{1}{2}\right)\frac{1}{2}m$, $\left(\frac{1}{2}\right)^2\frac{1}{3}m$, ..., $\left(\frac{1}{2}\right)^{N-1}\frac{1}{N}m$, ... ∞ are placed at x = 1, 2, 3,...N, ... ∞ respectively. If the total mass is M then the centre of mass of the system is

(A) $\left(\frac{2m}{M}, 0, 0\right)$
(B) $\left(\frac{m}{2M}, 0, 0\right)$
(C) $\left(\frac{4m}{M}, 0, 0\right)$
(D) $\left(\frac{m}{4M}, 0, 0\right)$

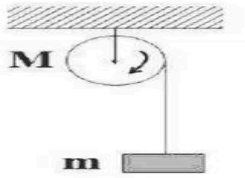
Answer: (A) $\left(\frac{2m}{M}, 0, 0\right)$ · The council's preliminary key

Q129 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

A block of mass m is hanging by a rope tied to a rotating solid disc of mass M and radius R as shown in the figure. If α is the angular acceleration of the disc, then the linear acceleration of the block is (g = acceleration due to gravity)
(see the figure above)

A block of mass m is hanging by a rope tied to a rotating solid disc of mass M and radius R as shown in the figure. If α is the angular acceleration of the disc, then the linear acceleration of the block is
(g = acceleration due to gravity)

ద్రవ్యరాశి M మరియు వ్యాసార్ధం R గల తిరిగే ఘన బిళ్ళకు కట్టిన దారానికి m ద్రవ్యరాశి గల దిమ్మె పటంలో చూపినట్లు వ్రేలాడు తున్నది. ఆ బిళ్ళ కోణీయ త్వరణము α అయిన దిమ్మె యొక్క రేఖీయ త్వరణము
(g =గురుత్వ త్వరణము)



Options :
1. $\frac{m}{m+M}g$
2. $\frac{m}{2m+M}g$
3. $\frac{m}{m+\frac{M}{2}}g$
4. $\frac{2m\alpha}{m+M}g$

(A) $\frac{m}{m+M}g$
(B) $\frac{m}{2m+M}g$
(C) $\frac{m}{m+\frac{M}{2}}g$
(D) $\frac{2m\alpha}{m+M}g$

Answer: (C) $\frac{m}{m+\frac{M}{2}}g$ · The council's preliminary key

Q130 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

A solid cylinder of radius R is at rest at a height h on an inclined plane. If it rolls down then its velocity on reaching the ground is

(A) $\sqrt{\frac{5gh}{3}}$
(B) $\sqrt{\frac{2h}{3g}}$
(C) $\sqrt{\frac{2gh}{3}}$
(D) $\sqrt{\frac{4gh}{3}}$

Answer: (D) $\sqrt{\frac{4gh}{3}}$ · The council's preliminary key

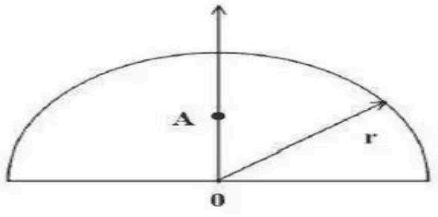
Q131 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

The centre of mass of a homogenous semi-circular plate of radius r is located at A as shown in the figure. The distance OA is

(see the figure above)

The centre of mass of a homogenous semi-circular plate of radius r is located at A as shown in the figure. The distance OA is

పటంలో చూపిన విధంగా r వ్యాసార్ధం గల అర్ధ వృత్తాకార పీక లీతి పలక ద్రవ్యరాశి కేంద్రము బిందువు A వద్ద ఉంది అయిన OA దూరము



Options :

1. $\frac{r}{3}$
2. $\frac{2r}{3}$
3. $\frac{r}{2}$
4. $\frac{4r}{5}$

(A) $\frac{r}{3}$
(B) $\frac{2r}{3}$
(C) $\frac{r}{2}$
(D) $\frac{4r}{5}$

Answer: (B) $\frac{2r}{3}$ · The council's preliminary key

Q132 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

The angular momentum of a wheel having a rotational inertia of $0.2\ \mathrm{kg\,m^2}$ about its symmetric axis decreases from 4 to $2\ \mathrm{kg\,m^2\,s^{-1}}$ in 4 s. The average power of the wheel is

(A) $7.5\ \mathrm{W}$
(B) $15\ \mathrm{W}$
(C) $5\ \mathrm{W}$
(D) $12\ \mathrm{W}$

Answer: (A) $7.5\ \mathrm{W}$ · The council's preliminary key

Q133 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

Masses $m\left(\frac{1}{3}\right)^N \frac{1}{N}$ are placed at x=N, when N = 2,3,4, . . . ∞. If the total mass of the system is M, then the centre of mass is

(A) $\frac{1}{6}\frac{m}{M}$
(B) $\frac{1}{5}\frac{m}{M}$
(C) $\frac{1}{3}\frac{m}{M}$
(D) $\frac{1}{2}\frac{m}{M}$

Answer: (A) $\frac{1}{6}\frac{m}{M}$ · The council's preliminary key

Q134 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

Consider a disc of radius R and mass M. A hole of radius $\frac{R}{3}$ is created in the disk such that the center of the hole is $\frac{R}{3}$ away from centre of the disk. The moment of inertia of the system along the axis perpendicular to the disc passing through the centre of the disc is

EdLoop EAPCET

(A) $\frac{MR^2}{2}$
(B) $\frac{13}{27}MR^2$
(C) $\frac{1}{3}MR^2$
(D) $4MR^2$

Answer: (B) $\frac{13}{27}MR^2$ · The council's preliminary key

Q135 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

A solid sphere of radius R has its outer half removed, so that its radius becomes (R/2). Then its moment of inertia about the diameter is

(A) becomes $\frac{1}{2}$ of its initial moment of inertia.
(B) is unchanged.
(C) becomes $\frac{1}{16}$ of initial moment of inertia.
(D) becomes $\frac{1}{32}$ of initial moment of inertia.

Answer: (D) becomes $\frac{1}{32}$ of initial moment of inertia. · The council's preliminary key

Q136 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

Rotational analogue of force in linear motion is _____

(A) Torque
(B) Moment of inertia
(C) Angular momentum
(D) Weight

Answer: (A) Torque · The council's preliminary key

Q137 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

The radius of gyration of a solid sphere of radius 'r' about a certain axis is 'r'. The distance of this axis from the centre of the sphere is

(A) r
(B) $0.5\,r$
(C) $\sqrt{0.6}\,r$
(D) $\sqrt{0.4}\,r$

Answer: (C) $\sqrt{0.6}\,r$ · The council's preliminary key

Q138 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

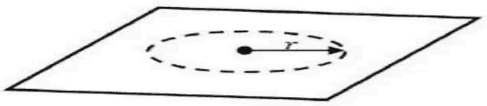
A small mass attached to a string rotates on a frictionless tabletop as shown. If the tension in the string is increased by pulling the string and causing the radius of the circular path to decrease by a

EdLoop EAPCET

factor of 2, the kinetic energy of the mass will _____
(see the figure above)

Mandatory : No

A small mass attached to a string rotates on a frictionless tabletop as shown. If the tension in the string is increased by pulling the string and causing the radius of the circular path to decrease by a factor of 2, the kinetic energy of the mass will _____



ఒక స్వల్ప ద్రవ్యరాశిని ఒక త్రాడుకు తగిలించి ఘర్షణలేని నున్నని బల్లపై పటములో చూపిన విధముగా తిప్పినారు. త్రాడును లాగి ద్రవ్యరాశి తిరిగే వృత్త వ్యాసార్ధము సగానికి తగ్గునట్లు తన్యతని పెంచితే, ఆ వస్తువు గతిజ శక్తి _____

Options :

1. decrease by a factor of 2
సగానికి తగ్గుతుంది

2. remain constant
మారదు

3. increase by a factor of 2
రెట్టింపు అవుతుంది

4. increase by a factor of 4
నాలుగు రెట్లు అవుతుంది

(A) decrease by a factor of 2
(B) remain constant
(C) increase by a factor of 2
(D) increase by a factor of 4

Answer: (D) increase by a factor of 4 · The council's preliminary key

Q139 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

A uniform disc of radius 'a' and mass 'm' is rotating freely with an angular speed of 'ω' in a horizontal plane about a smooth fixed vertical axis passing through its center. A particle, also of mass 'm' is suddenly attached to the rim of the disc and starts to rotate with it. The new angular speed of this system is _____

(A) $\frac{\omega}{3}$
(B) $\frac{\omega}{6}$
(C) $\frac{\omega}{2}$
(D) $\frac{\omega}{5}$

Answer: (A) $\frac{\omega}{3}$ · The council's preliminary key

Q140 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

The moment of inertia of a thin rod of mass 'M' and length 'L' about an axis passing through a point at a distance $\frac{L}{4}$ from its center and perpendicular to its length is _____

(A) $\frac{ML^3}{48}$
(B) $\frac{ML^2}{48}$
(C) $\frac{ML^2}{12}$
(D) $\frac{7ML^2}{48}$

Answer: (D) $\frac{7ML^2}{48}$ · The council's preliminary key

Q141 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

The torque due to a force $\vec{F} = 3\hat{i} - 2\hat{j} - \hat{k}$ acting at a point $\vec{r} = 8\hat{i} + 2\hat{j} + 3\hat{k}$ is _____

(A) $-4\hat{i} - 17\hat{j} + 22\hat{k}$
(B) $4\hat{i} + 17\hat{j} - 22\hat{k}$
(C) $8\hat{i} - 17\hat{j} + 22\hat{k}$
(D) $-4\hat{i} - 17\hat{j} - 22\hat{k}$

Answer: (B) $4\hat{i} + 17\hat{j} - 22\hat{k}$ · The council's preliminary key

Q142 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Moment of inertia of a disc of radius 'R' about a diametric axis is $25\,\text{kg.m}^2$. The moment of inertia of the disc about a parallel axis at a distance 'R/2' from the centre is _____

(A) $31.25\,\text{kg.m}^2$
(B) $37.5\,\text{kg.m}^2$
(C) $50\,\text{kg.m}^2$
(D) $62.5\,\text{kg.m}^2$

Answer: (C) $50\,\text{kg.m}^2$ · The council's preliminary key

Q143 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

A wheel is rotating at $480\,\text{rpm}$. Find the magnitude of angular acceleration required to stop the wheel in 8 seconds?

(A) $2\pi\,\text{rad.s}^{-2}$
(B) $2.5\pi\,\text{rad.s}^{-2}$
(C) $2\,\text{rad.s}^{-2}$
(D) $3.5\,\text{rad.s}^{-2}$

Answer: (A) $2\pi\,\text{rad.s}^{-2}$ · The council's preliminary key

Q144 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Three thin rods each of length 'L' and mass 'M' are placed along x, y and z axes in such a way that one end of each of the rods is at the origin. The moment of inertia of this system about z-axis is: *(see the figure above)*

EdLoop EAPCET

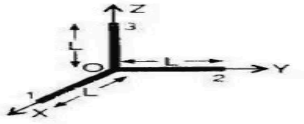
Mandatory : No

AP EAPCET 2021

AP EAPCET 2021

Three thin rods each of length 'L' and mass 'M' are placed along x, y and z axes in such a way that one end of each of the rods is at the origin. The moment of inertia of this system about z-axis is:

ప్రతి కడ్డీ పొడవు 'L' మరియు ద్రవ్యరాశి 'M' గల మూడు పలుచని కడ్డీలను x, y మరియు z అక్షాల వెంబడి ఉంచి ప్రతి కడ్డీ యొక్క చివర దాని మూల బిందువుల వద్ద ఉండారు. z అక్షము పరముగా ఆ వ్యవస్థ జడత్వ భ్రామకము ఎంత?



Options :

1. $\frac{2ML^2}{3}$
2. $\frac{4ML^2}{3}$
3. $\frac{5ML^2}{3}$
4. $\frac{ML^2}{3}$

(A) $\frac{2ML^2}{3}$
(B) $\frac{4ML^2}{3}$
(C) $\frac{5ML^2}{3}$
(D) $\frac{ML^2}{3}$

Answer: (A) $\frac{2ML^2}{3}$ · The council's preliminary key

Q145 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

A thin rod of mass 'm' and length '2l' is made to rotate about an axis passing through its centre and perpendicular to it. Its angular velocity changes from 0 to ω in time 't'. What is the torque acting on the rod?

(A) $\frac{ml^2\omega}{12\,t}$
(B) $\frac{ml^2\omega}{t}$
(C) $\frac{ml^2\omega}{3\,t}$
(D) $\frac{4\,ml^2\omega}{3\,t}$

Answer: (C) $\frac{ml^2\omega}{3\,t}$ · The council's preliminary key

Q146 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

A flywheel having moment of inertia $10\ \mathrm{kg.m^2}$ is rotating at $50\ \mathrm{rad.s^{-1}}$. What amount of work needs to be done in order to bring this flywheel to rest in 10 seconds?

(A) 11400 J
(B) 12500 J
(C) 13000 J
(D) 14500 J

Answer: (B) 12500 J · The council's preliminary key

Q147 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

The distance between the carbon atom and the oxygen atom in a carbon monoxide molecule is 1.1 Å. Given, mass of carbon atom is $12\ a.m.u$ and mass of oxygen atom is $16\ a.m.u$. Calculate the position of the centre of mass of the carbon monoxide molecule.

(A) 6.3 Å from the Carbon atom
(B) 1.0 Å from the Oxygen atom
(C) 0.63 Å from the Carbon atom
(D) 0.12 Å from the Oxygen atom

Answer: (C) 0.63 Å from the Carbon atom · The council's preliminary key

Q148 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

A circular disc is to be made by using equal masses of aluminium and iron. To get maximum moment of inertia, about its geometrical axis, it should be prepared in a way that

(A) Aluminium is at the interior and the iron surrounding it
(B) Iron is at the interior and the aluminium surrounding it
(C) Aluminium and iron are used in alternate layers
(D) Aluminium and iron discs should be kept one above the other

Answer: (A) Aluminium is at the interior and the iron surrounding it · The council's preliminary key

Q149 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

The moment of inertia of a body about a certain axis is $1.2\ kg.m^2$. Initially, the body is at rest. In order to produce rotational kinetic energy of 1800 J, an angular acceleration of $30\ rad.s^{-2}$ must be applied about the given axis for a duration of _____ seconds.

(A) $\frac{\sqrt{10}}{3}$
(B) $\frac{\sqrt{30}}{3}$
(C) $\frac{\sqrt{3}}{10}$
(D) $\frac{1}{\sqrt{3}}$

Answer: (B) $\frac{\sqrt{30}}{3}$ · The council's preliminary key

Q150 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

A wheel having moment of inertia $40\ \mathrm{kg.m^2}$ about its axis, rotates at $50\ rpm$. The angular retardation required to stop this wheel in 90 seconds is _____ $\mathrm{rad.s^{-2}}$

(A) $\frac{\pi}{45}$
(B) $\frac{\pi}{30}$
(C) $\frac{\pi}{54}$
(D) $\frac{\pi}{24}$

Answer: (C) $\frac{\pi}{54}$ · The council's preliminary key

Q151 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

Three point-masses m_1, m_2 and m_3 are located at the vertices of an equilateral triangle, having each side of length 'L'. The moment of inertia of the system about an axis along an altitude of the triangle passing through m_1 is given by

(A) $I = (m_1 + m_2 + m_3)\, L^2$
(B) $I = (m_1 + m_2)\frac{L^2}{2}$
(C) $I = (m_2 + m_3)\, L^2$
(D) $I = (m_2 + m_3)\frac{L^2}{4}$

Answer: (D) $I = (m_2 + m_3)\frac{L^2}{4}$ · The council's preliminary key

Q152 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

A rod AB of length $1\ m$ is placed at the edge of a smooth table as shown. It is hit horizontally at point 'B'. If the displacement of center of mass in $1\ s$ is $5\sqrt{2}\ m$, the angular velocity of the rod is _____ (Take $g = 10\ \mathrm{m.s^{-2}}$)

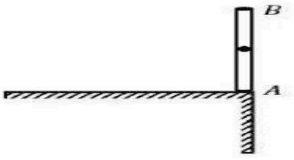
(see the figure above)

EdLoop EAPCET

Mandatory : No

AP EAPCET 2021
AP EAPCET 2021

A rod AB of length $1\ m$ is placed at the edge of a smooth table as shown. It is hit horizontally at point 'B'. If the displacement of center of mass in $1\ s$ is $5\sqrt{2}\ m$, the angular velocity of the rod is _____
(Take $g = 10\ m.s^{-2}$)



$1\ m$ పొడవుగల ఒక కడ్డీ AB మృదువైన బల్ల అంచున పటములో చూపిన విధముగా ఉన్నది. బిందువు 'B' వద్ద అది క్షితిజ సమాంతరముగా కొట్టబడినది. ఒక సెకనులో దాని ద్రవ్యరాశి కేంద్ర స్థానభ్రంశము $5\sqrt{2}\ m$ అయితే కడ్డీ యొక్క కోణీయ వేగము _____ ($g = 10\ m.s^{-2}$)

Options :

1. $30\ rad.s^{-1}$
2. $20\ rad.s^{-1}$
3. $10\ rad.s^{-1}$
4. $5\ rad.s^{-1}$

(A) $30\ \text{rad.s}^{-1}$
(B) $20\ \text{rad.s}^{-1}$
(C) $10\ \text{rad.s}^{-1}$
(D) $5\ \text{rad.s}^{-1}$

Answer: (A) $30\ \text{rad.s}^{-1}$ · The council's preliminary key

Q153 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

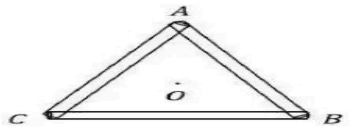
Three rods each of mass $1\ kg$ and length $2\ m$ are joined together end-to-end to form an equilateral triangle ABC. Find the moment of inertia of this system about an axis passing through its centre of mass and perpendicular to the plane of the triangle.
(see the figure above)

Mandatory : No

AP EAPCET 2021
AP EAPCET 2021

Three rods each of mass 1 kg and length 2 m are joined together end-to-end to form an equilateral triangle ABC. Find the moment of inertia of this system about an axis passing through its centre of mass and perpendicular to the plane of the triangle.

ఒక్కొక్కటి 1 kg ద్రవ్యరాశి మరియు 2 m పొడవు కలిగిన మూడు కడ్డీలు పటములో చూపిన విధముగా ఒక సమబాహు త్రిభుజము ఏర్పడేటట్లు కలుపబడ్డాయి. అయితే, దాని యొక్క ద్రవ్యరాశి కేంద్రము గుండా పోతూ త్రిభుజ తలానికి లంబముగా ఉండే అక్షము పరముగా ఆ వ్యవస్థ యొక్క జడత్వ భ్రామకము ఎంత?



Options :

1. $4\ kg.m^2$
2. $2\ kg.m^2$
3. $3\ kg.m^2$
4. $6\ kg.m^2$

(A) $4\ \text{kg.m}^2$
(B) $2\ \text{kg.m}^2$
(C) $3\ \text{kg.m}^2$
(D) $6\ \text{kg.m}^2$

Answer: (B) $2\ \text{kg.m}^2$ · The council's preliminary key

Q154 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

A disc of mass 4 kg and radius 0.4 m is rotating with angular velocity 30 $rad.s^{-1}$. When two point-masses, each 0.25 kg, are attached on the periphery of the disc, at diametrically opposite points, its angular velocity becomes _____

(A) $24\ rad.s^{-1}$
(B) $27\ rad.s^{-1}$
(C) $21\ rad.s^{-1}$
(D) $10\ rad.s^{-1}$

Answer: (A) $24\ rad.s^{-1}$ · The council's preliminary key

Q155 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

If rotational inertia parameter of a body rolling down a rough inclined plane (of inclination θ and height h) without slipping is given by $\beta = I_{CM}/MR^2$, then time taken by the body to reach the bottom of the inclined plane is given by _____

(A) $t = \frac{1}{\sin\theta}\sqrt{\frac{(1+\beta)2h}{g}}$

(B) $t = \frac{1}{\cos\theta}\sqrt{\frac{(1+\beta)2h}{g}}$

(C) $t = \frac{1}{\sin\theta}\sqrt{\frac{(1-\beta)2h}{g}}$

(D) $t = \frac{1}{\sin\theta}\sqrt{\frac{(1+\beta)h}{g}}$

Answer: (A) $t = \frac{1}{\sin\theta}\sqrt{\frac{(1+\beta)2h}{g}}$ · The council's preliminary key

---

Q156 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

A sphere and a hollow cylinder without slipping, roll down two separate inclined planes A and B respectively. They cover same distance in a given duration. If the angle of inclination of plane A is 30°, then and the angle of inclination of plane B must be _____ (approximately).

(A) 60°

(B) 53°

(C) 45°

(D) 37°

Answer: (C) 45° · The council's preliminary key

Q157 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

Four spheres each of diameter '$2a$' and mass 'm' are placed in a way that their centers lie on the four corners of a square of side 'b'. Moment of inertia of the system about an axis along one of the sides of the square is _____.

(A) $\frac{8}{5}ma^2$

(B) $\frac{4}{5}ma^2 + 5mb^2$

(C) $\frac{4}{5}ma^2 + 2mb^2$

(D) $\frac{8}{5}ma^2 + 2mb^2$

Answer: (D) $\frac{8}{5}ma^2 + 2mb^2$ · The council's preliminary key

---

Q158 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

If an energy of 684 J is needed to increase the speed of a fly wheel from 180 rpm to 360 rpm, then find its moment of inertia.

(A) $0.7\ \mathrm{kg.m^2}$
(B) $1.28\ \mathrm{kg.m^2}$
(C) $2.75\ \mathrm{kg.m^2}$
(D) $7.28\ \mathrm{kg.m^2}$

Answer: (B) $1.28\ \mathrm{kg.m^2}$ · The council's preliminary key

Q159 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

As (sic) solid sphere of mass 'M' and radius 'R' spins about an axis passing through its centre making $600\ rpm$. Its kinetic energy of rotation is

(A) $\frac{2\pi^2}{5}MR$
(B) $\frac{2\pi}{5}M^2R^2$
(C) $80\pi\ MR$
(D) $80\pi^2\ MR^2$

Answer: (D) $80\pi^2\ MR^2$ · The council's preliminary key

Q160 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

Two fly wheels A and B are mounted side by side with frictionless bearings on a common shaft. Their moments of inertia about the shaft are $5.0\ kg.m^2$ and $20.0\ kg.m^2$ respectively. Wheel A is made to rotate at 10 revolution per second. Wheel B, initially stationary, is now coupled to A with the help of a clutch. The rotation speed of the wheels will become

(A) $2\sqrt{5}\ rps$
(B) $0.5\ rps$
(C) $2\ rps$
(D) $3\ rps$

Answer: (C) $2\ rps$ · The council's preliminary key

Q161 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

Which of the following type of wheels of same mass and radius will have largest moment of inertia?

(A) Ring
(B) Angular disc
(C) Solid disc
(D) Cylindrical disc

Answer: (A) Ring · The council's preliminary key

Q162 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

The sum of moments of all the particles in a system about its center of mass is always _____

(A) Minimum
(B) Zero
(C) Maximum
(D) Infinite

Answer: (B) Zero · The council's preliminary key

Q163 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

A particle of mass 'm' is projected with a velocity 'u' making an angle 'θ' with the horizontal. The magnitude of angular momentum of the projectile about the point of projection when the particle is at its maximum height is _____

(A) 0
(B) $\frac{mu\sin^2\theta\cos\theta}{2g}$
(C) $\frac{2mu^2\cos^2\theta\sin\theta}{g}$
(D) $\frac{mu^3\sin^2\theta\cos\theta}{2g}$

Answer: (D) $\frac{mu^3\sin^2\theta\cos\theta}{2g}$ · The council's preliminary key

Q164 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

A girl of mass 'M' stands on the rim of a friction less merry-go-round, of radius 'R' and rotational inertia 'I', that is not moving. She throws a rock of mass 'm' horizontally in a direction that is tangent to the outer edge of the merry-go-round. The speed of the rock, relative to the ground is 'v'. Afterwards, the linear speed of the girl is _____

(A) $\frac{mvR^2}{I+MR^2}$
(B) $\frac{(m+M)vR^2}{I+MR^2}$
(C) $\frac{mvR^2}{I+(M+m)R^2}$
(D) $\frac{mvR^2}{I+(M-m)R^2}$

Answer: (A) $\frac{mvR^2}{I+MR^2}$ · The council's preliminary key

Q165 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

A 750 kg boat is 10 m long and is floating without motion on still water. A man of mass 80 kg is at one end and if he runs to another end of the boat and stops, the displacement of boat is

(A) 1.8 m in the direction of displacement of man
(B) 0.96 m in the direction of opposite to the displacement of man
(C) 0.96 m in the direction of displacement of the man
(D) 1.8 m in the direction opposite to displacement of man

Answer: (B) 0.96 m in the direction of opposite to the displacement of man · The council's preliminary key

Q166 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

A wheel of mass 20 kg and radius 30 cm is rotating at an angular speed of 80 rev/min when the motor is turned off. Neglecting the friction at the axis, calculate the force that must be applied tangentially to the wheel to bring it to rest in 5 revolutions.

(A) 1.06π N
(B) 2.06π N
(C) 3.06π N
(D) 4.06π N

Answer: (A) 1.06π N · The council's preliminary key

Q167 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

Three bodies a ring, a solid cylinder and a solid sphere roll down an inclined plane without slipping. They start from rest. Which of the bodies reaches bottom of plane with minimum velocity?

(A) ring
(B) solid cylinder
(C) solid sphere
(D) both ring & solid sphere

Answer: (A) ring · The council's preliminary key

Q168 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

A wheel undergoes a constant angular acceleration from time t = 0 to t = 20 s and thereafter angular acceleration is zero. If angular velocity at t = 2 s is found to be 5 rad/s, then the number of revolutions made by the wheel in time interval t = 0 s to t = 50 s is

(A) $1000/\pi$
(B) 600π
(C) $1500/\pi$
(D) $2000/\pi$

Answer: (A) $1000/\pi$ · The council's preliminary key

Q169 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

A circular hoop of radius 50 cm and mass 1 kg rotating with an angular velocity ω_0 is placed on a rough horizontal surface. The initial velocity of the centre of the hoop is zero. Let 'v' be the velocity of the centre of the hoop when it ceases to slip. The ratio v/ω_0 will be

(A) 10 cm
(B) 50 cm
(C) 25 cm
(D) 12.5 cm

Answer: (C) 25 cm · The council's preliminary key

Q170 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

A rigid body of mass M and radius R rolls without slipping on an inclined plane of inclination θ, under gravity. Match the type of body Column I with magnitude of the force of friction Column II.

Column I

A) For ring
B) For solid sphere
C) For solid cylinder
D) For hallow cylinder

Column II

I) $\frac{Mg\sin\theta}{2.5}$
II) $\frac{Mg\sin\theta}{3}$
III) $\frac{Mg\sin\theta}{3.5}$
IV) $\frac{Mg\sin\theta}{2}$

(A) A-IV, B-III, C-II, D-IV
(B) A-I, B-II, C-IV, D-IV
(C) A-II, B-I, C-IV, D-III
(D) A-II, B-IV, C-I, D-III

Answer: (A) A-IV, B-III, C-II, D-IV · The council's preliminary key

Q171 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

A small disc of mass 500 gm and radius 5 cm rolls down an inclined plane without slipping. Speed of its center of mass when it reaches the bottom of the incline plane depends on

(A) mass & radius
(B) mass & height of the incline
(C) height of the incline
(D) height of the incline and acceleration due to gravity

Answer: (D) height of the incline and acceleration due to gravity · The council's preliminary key

EdLoop EAPCET

Q172 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

If the earth shrinks to $\frac{1}{8}$ of its original volume, while maintaining the same mass, then the duration of the day will be

(A) 8 hrs
(B) 48 hrs
(C) 6 hrs
(D) 72 hrs

Answer: (C) 6 hrs · The council's preliminary key

Q173 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

A thin uniform rod of mass 1 kg and length 1 m is hanged at one end to the ground floor. It originally stands vertically and allowed to fall to the ground. If the rod hits the ground with angular speed ω then the correct statement is
(Assume $g = 10\ \mathrm{m/s^2}$)

(A) $\omega = \sqrt{30}\ \mathrm{rad/s}$
(B) $\omega = \sqrt{20}\ \mathrm{rad/s}$
(C) $\omega = 5\ \mathrm{rad/s}$
(D) $\omega = 6\ \mathrm{rad/s}$

Answer: (A) $\omega = \sqrt{30}\ \mathrm{rad/s}$ · The council's preliminary key

Q174 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

If the radius of a sphere is doubled by keeping its mass constant, compare the moment of inertia of the old sphere with that of the new sphere, about any diameter.

(A) $I_1 : I_2 = 1 : 4$
(B) $I_1 : I_2 = 1 : 2$
(C) $I_1 : I_2 = 4 : 1$
(D) $I_1 : I_2 = 2 : 1$

Answer: (A) $I_1 : I_2 = 1 : 4$ · The council's preliminary key

Q175 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

Kinetic energy of rotation of a flywheel of radius $2\ \mathrm{m}$, mass $8\ \mathrm{kg}$ and angular speed $4\ \mathrm{rad.s^{-1}}$ about an axis perpendicular to its plane and passing through its center is

EdLoop EAPCET

(A) 128 J
(B) 196 J
(C) 256 J
(D) 392 J

Answer: (A) 128 J · The council's preliminary key

Q176 AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

A uniform solid sphere of radius 'R' and radius of gyration 'K' about an axis passing through the centre of mass, is rolling without slipping. Then the fraction of total energy associated with its rotation will be _____

(A) $\frac{K^2+R^2}{K^2}$
(B) $\frac{K^2}{R^2}$
(C) $\frac{K^2}{K^2+R^2}$
(D) $\frac{R^2}{K^2+R^2}$

Answer: (C) $\frac{K^2}{K^2+R^2}$ · The council's preliminary key

Q177 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

Two atoms of oxygen are located at $\vec{r_1}$ and $\vec{r_2}$. Their Centre of mass is at

(A) $\vec{r_1}+\vec{r_2}$
(B) $\frac{\vec{r_1}-\vec{r_2}}{2}$
(C) $\frac{\vec{r_1}+\vec{r_2}}{2}$
(D) $\vec{r_1}-\vec{r_2}$

Answer: (C) $\frac{\vec{r_1}+\vec{r_2}}{2}$ · The council's preliminary key

Q178 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

Effect of a couple is _____

(A) Purely linear motion
(B) Purely rotational motion
(C) Linear and rotational motion
(D) No motion

Answer: (B) Purely rotational motion · The council's preliminary key

Q179 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

When the torque acting upon a system is zero, the parameter that remains constant is _____

(A) Force
(B) Linear momentum
(C) Angular momentum
(D) Linear impulse

Answer: (C) Angular momentum · The council's preliminary key

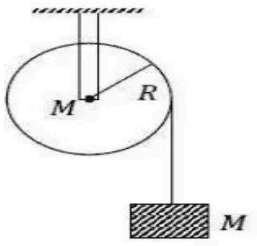
Q180 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

A mass M is supported by a mass less string wound around a uniform cylinder of mass M and radius R. On releasing the mass from rest, it will fall with acceleration _____ *(see the figure above)*

Orientation : Vertical

A mass M is supported by a mass less string wound around a uniform cylinder of mass M and radius R. On releasing the mass from rest, it will fall with acceleration _____

M ద్రవ్యరాశి, R వ్యాసార్ధం గల ఒక స్థూపానికి, M ద్రవ్యరాశి కలుపబడిన ద్రవ్యరాశి రహిత తీగను ఏకరీతిగా చుట్టబడింది. నిశ్చలంగా ఉన్న ద్రవ్యరాశిని క్రిందికి పడేటట్లు చేసిన, దాని త్వరణం ఎంత?



Options :

1. g
2. $\frac{g}{2}$
3. $\frac{2g}{3}$
4. $\frac{3g}{2}$

(A) g
(B) $\frac{g}{2}$
(C) $\frac{2g}{3}$
(D) $\frac{3g}{2}$

Answer: (C) $\frac{2g}{3}$ · The council's preliminary key

Q181 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

A 20 kg flywheel in the form of a uniform circular disc, 1 m in diameter. is making 120 rpm. What is its angular momentum?

(A) $3.14\ \mathrm{kg.m^2.s^{-1}}$
(B) $31.4\ \mathrm{kg.m^2.s^{-1}}$
(C) $314\ \mathrm{kg.m^2.s^{-1}}$
(D) $0.314\ \mathrm{kg.m^2.s^{-1}}$

Answer: (B) $31.4\ \mathrm{kg.m^2.s^{-1}}$ · The council's preliminary key

Q182 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

The moment of inertia of a rectangular plate of mass M, length L and breadth B, about an axis passing through its centre and perpendicular to its plane is _____

(A) $\frac{M(L+B)}{12}$
(B) $\frac{M(L^2)}{12}$
(C) $\frac{M(L^2+B^2)}{12}$
(D) $\frac{M(B^2)}{12}$

Answer: (C) $\frac{M(L^2+B^2)}{12}$ · The council's preliminary key

Q183 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

A body of mass $5\ \mathrm{kg}$ acquires an acceleration of $10\ \mathrm{rad.s^{-2}}$ due to an applied torque of $2\ \mathrm{Nm}$. Its radius of gyration is _____

(A) $2.5\ \mathrm{m}$
(B) $\sqrt{2.5}\ \mathrm{m}$
(C) $\sqrt{0.2}\ \mathrm{m}$
(D) $0.2\ \mathrm{m}$

Answer: (D) $0.2\ \mathrm{m}$ · The council's preliminary key

Q184 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

A solid cylinder of mass 'M' and radius 'R' rolls down an inclined plane of length 'L' and height 'h', without slipping. Find the speed of its centre of mass when the cylinder reaches its bottom?

(A) $\sqrt{2gh}$
(B) $\sqrt{\frac{3gh}{4}}$
(C) $\sqrt{\frac{4gh}{3}}$
(D) $\sqrt{4gh}$

Answer: (C) $\sqrt{\frac{4gh}{3}}$ · The council's preliminary key

EdLoop EAPCET

Q185 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

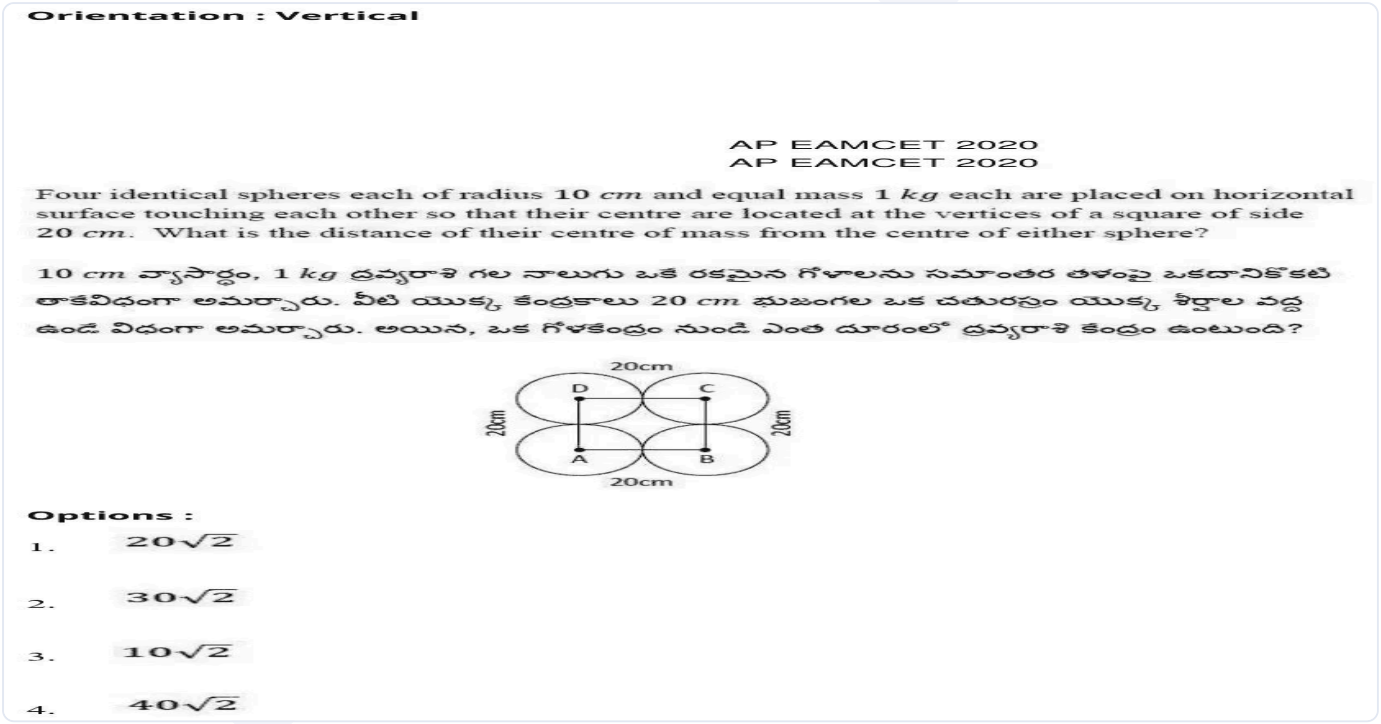
A uniform circular disc has radius 'r'. A square portion of diagonal 'r' is cut from it. The centre of mass of the remaining disc from the centre of disc is

(A) $\frac{r}{2-4\pi}$
(B) $\frac{r}{3-3\pi}$
(C) $\frac{r}{2-5\pi}$
(D) $\frac{2r}{1-2\pi}$

Answer: (A) $\frac{r}{2-4\pi}$ · The council's preliminary key

Q186 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

Four identical spheres each of radius $10\,\mathrm{cm}$ and equal mass $1\,\mathrm{kg}$ each are placed on horizontal surface touching each other so that their centre are located at the vertices of a square of side $20\,\mathrm{cm}$. What is the distance of their centre of mass from the centre of either sphere?
(see the figure above)



(A) $20\sqrt{2}$
(B) $30\sqrt{2}$
(C) $10\sqrt{2}$
(D) $40\sqrt{2}$

Answer: (C) $10\sqrt{2}$ · The council's preliminary key

Q187 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

The center of a wheel rolling on a plane surface moves with a speed V_o. A particle on the rim of the wheel at the same level as the center will be moving at a speed _____

(A) 0
(B) V_o
(C) $\sqrt{2}\,V_o$
(D) $2\,V_o$

Answer: (C) $\sqrt{2}\,V_o$ · The council's preliminary key

Q188 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

A ballet dancer suddenly folds her outstretched arms. Her angular velocity

(A) increases
(B) decreases
(C) remains the same
(D) may increase or decrease

Answer: (A) increases · The council's preliminary key

Q189 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

At high altitude, a body explodes which is at rest into two equal fragments with one fragment receiving horizontal velocity of $10\,\mathrm{m.s^{-1}}$. Time taken by the two radius vectors connecting point of explosion to fragments to make 90° is

(A) $10\,\mathrm{s}$
(B) $4\,\mathrm{s}$
(C) $2\,\mathrm{s}$
(D) $1\,\mathrm{s}$

Answer: (C) $2\,\mathrm{s}$ · The council's preliminary key

Q190 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

A mass 'm' is in rest on an inclined plane of mass 'M' which is further resting on a smooth horizontal plane. Now, if the mass 'm' starts moving under gravity, the position of center of mass of system will

(A) Remain unchanged
(B) Change along the horizontal direction
(C) Move down in vertical direction
(D) Move down in the vertical direction and changes along the horizontal

Answer: (C) Move down in vertical direction · The council's preliminary key

Q191 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

A light meter rod has two-point masses each of $2\,\mathrm{kg}$ fixed at its ends. If the system rotates about its centre of mass with an angular speed of $0.5\,\mathrm{rad.s^{-1}}$, its rotational K.E. is

EdLoop EAPCET

(A) 0.125 erg
(B) 1.25 erg
(C) 1.25 J
(D) 0.125 J

Answer: (D) 0.125 J · The council's preliminary key

Q192 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

If the raw egg and boiled egg are subjected to spin on a table by applying the equal torque, then the egg that spins with the greater speed is

(A) raw egg
(B) boiled egg
(C) Both eggs have equal speed
(D) Both eggs never spin

Answer: (B) boiled egg · The council's preliminary key

Q193 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

A solid cylinder of mass M and radius R rolls on a flat surface. Its moment of inertia about the line of contact is _____

(A) $\left(\frac{3}{2}\right) MR^2$
(B) MR^2
(C) $\left(\frac{2}{3}\right) MR^2$
(D) $2\,MR^2$

Answer: (A) $\left(\frac{3}{2}\right) MR^2$ · The council's preliminary key

Q194 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

Four-point masses, each of mass M, are placed at the corners of a square of side L. The moment of inertia of the system about one of its diagonals is

(A) $2ML^2$
(B) ML^2
(C) $4ML^2$
(D) $6ML^2$

Answer: (B) ML^2 · The council's preliminary key

Q195 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

A flywheel starts from rest and rotates at a constant acceleration of $2\ rad.s^{-2}$. The number of revolutions that it makes in first ten seconds is

EdLoop EAPCET

(A) 16
(B) 24
(C) 32
(D) 8

Answer: (A) 16 · The council's preliminary key

Q196 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

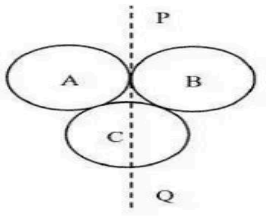
There identical uniform solid spheres each of mass 'm' and radius 'r' are joined as shown in the figure, with centers lying in the same plane. The moment of inertia of the system about an axis lying in that plane and passing through the center of sphere C is
(see the figure above)

AP EAMCET 2020
AP EAMCET 2020

Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical

There identical uniform solid spheres each of mass 'm' and radius 'r' are joined as shown in the figure, with centers lying in the same plane. The moment of inertia of the system about an axis lying in that plane and passing through the center of sphere C is

'm' ద్రవ్యరాశి, 'r' వ్యాసార్ధము గల మూడు సర్వసమాన వికరీతి ఘన గోళాలు పటములో చూపినట్లు, వాటి కేంద్రాలని ఒకే తలములో కలిగి ఉన్నాయి. ఆ గోళము C కేంద్రము గుండా పోతూ, ఆ తలంలో ఉన్న ఒక(క్రింద చూపిన) అక్షము పరంగా వ్యవస్థ జడత్వ భ్రామకము తెలపండి.



Options :

1. $\frac{16}{5}\ mr^2$
2. $\frac{12}{5}\ mr^2$
3. $4\ mr^2$
4. $\frac{3}{5}\ mr^2$

(A) $\frac{16}{5}mr^2$
(B) $\frac{12}{5}mr^2$
(C) $4\,mr^2$
(D) $\frac{3}{5}mr^2$

Answer: (A) $\frac{16}{5}mr^2$ · The council's preliminary key

Q197 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

A disc of moment of inertia I_1 is rotating with an angular velocity w_1. Another disc of moment of inertia I_2 which is not rotating, is gently put on the first disc. The angular speed of the system will be

_____

(A) $\left(\frac{I_1+I_2}{I_1}\right)w_1$

(B) $\left(\frac{I_1}{I_1+I_2}\right)w_1$

(C) $\left(\frac{I_1-I_2}{I_1}\right)w_1$

(D) $\left(\frac{I_1}{I_1-I_2}\right)w_1$

Answer: (B) $\left(\frac{I_1}{I_1+I_2}\right)w_1$ · The council's preliminary key

---

Q198 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

The speed of a uniform solid sphere after rolling down from rest without slipping along a fixed inclined plane of vertical height 'h' is _____

(A) $\sqrt{\frac{10\,gh}{7}}$

(B) $\sqrt{gh}$

(C) $\sqrt{\frac{6\,gh}{5}}$

(D) $\sqrt{\frac{4\,gh}{3}}$

Answer: (A) $\sqrt{\frac{10\,gh}{7}}$ · The council's preliminary key

---

Q199 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

A straight rod of length L is made of a material having mass per unit length $m(x)=\lambda|x|$, where x is measured from the centre of rod. The moment of inertia about an axis perpendicular to the rod and passing through one end of the rod will be, $L=1\,\mathrm{m}$ and $\lambda=16\,\mathrm{kg/m^2}$

(A) $\frac{32}{3}\,\mathrm{kg-m^2}$

(B) $40\,\mathrm{kg-m^2}$

(C) $\frac{36}{5}\,\mathrm{kg-m^2}$

(D) $246\,\mathrm{kg-m^2}$

Options (1) or (2) or (3) or (4) were accepted. More than one answer was accepted. · Official TGCHE final key

---

Q200 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

Consider a uniform horizontal solid cylinder of mass 10 kg such that its length is 9 times its radius. Let the radius be 40 cm. Calculate the moment of inertia of the cylinder about a line passing through its edge and perpendicular to its axis

EdLoop EAPCET

(A) $21.3\,\text{kg-m}^2$
(B) $18.7\,\text{kg-m}^2$
(C) $23.6\,\text{kg-m}^2$
(D) $10.9\,\text{kg-m}^2$

Any attempt was accepted. Full marks for attempting. · Official TGCHE final key

Q201 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

A solid sphere of mass 2 kg rolls on a smooth horizontal surface at 10 m/s. It then rolls up a smooth inclined plane of inclination 30^0 with the horizontal. The height attained by the sphere before it stops is
[Take g as 10 m /sec^2]

(A) 70 cm
(B) 701 cm (sic)
(C) 7.0 m
(D) 70 m

Answer: (C) 7.0 m · Official TGCHE final key

Q202 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

A rod of length L revolves in a horizontal plane about the axis passing through its center and perpendicular to its length. The angular velocity of the rod is ω. If A is the area of cross-section of the rod and ρ is its density, then the rotational kinetic energy of the rod is

(A) $\frac{1}{3}AL^3\rho\omega^2$
(B) $\frac{1}{2}AL^3\rho\omega^2$
(C) $\frac{1}{24}AL^3\rho\omega^2$
(D) $\frac{1}{18}AL^3\rho\omega^2$

Answer: (C) $\frac{1}{24}AL^3\rho\omega^2$ · Official TGCHE final key

Q203 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

Consider a thin metal strip of mass 1 kg and length 5m. Calculate its moment of inertia about an axis perpendicular to strip and located at 100 cm on strip from one of its end.
(Assume the breadth as the strip is negligible)

(A) $4.33\ \mathrm{kg-m^2}$
(B) $4.85\ \mathrm{kg-m^2}$
(C) $4.11\ \mathrm{kg-m2}$ (sic)
(D) $4.66\ \mathrm{kg-m^2}$

Answer: (A) $4.33\ \mathrm{kg-m^2}$ · Official TGCHE final key

Q204 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

A solid cylinder is released from rest from the top of an inclined plane of inclination 30° and length 60 cm. If the cylinder rolls without slipping, then the speed when it reaches the bottom is

(A) $1.5\ \mathrm{m/s}$
(B) $2.0\ \mathrm{m/s}$
(C) $3.0\ \mathrm{m/s}$
(D) $6.0\ \mathrm{m/s}$

Answer: (B) $2.0\ \mathrm{m/s}$ · Official TGCHE final key

Q205 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

A circular hole of radius 3 cm is cut out from a uniform circular disc of radius 6 cm. The centre of the hole is at 3 cm, from the centre of the original disc. The distance of centre of gravity of the resulting flat body from the centre of the original disc is:

(A) 0.5 cm
(B) 1 cm
(C) 1.5 cm
(D) 0.75cm

Answer: (B) 1 cm · Official TGCHE final key

Q206 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

A solid sphere and a solid cylinder, each of mass M and radius R are rolling with a linear speed on a flat surface without slipping. Let L_1 be magnitude of the angular momentum of the sphere with respect to a fixed point along the path of the sphere. Likewise L_2 be the magnitude of angular momentum of the cylinder with respect to the same fixed point along its path. The ratio $\frac{L_1}{L_2}$ is

(A) $\frac{14}{15}$
(B) $\frac{4}{5}$
(C) $\frac{2}{5}$
(D) $\frac{7}{15}$

Answer: (A) $\frac{14}{15}$ · Official TGCHE final key

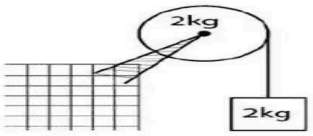
Q207 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

An object of mass 2 kg is hanging from a rope that is wrapped around a pulley of radius 25 cm. The mass of pulley is 2 kg. Find the acceleration of the object.
(Assume pulley to be a solid disk; g = 10 m/s^2)
(see the figure above)

Question Number : 92 Question Id : 719650572 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

An object of mass 2 kg is hanging from a rope that is wrapped around a pulley of radius 25 cm. The mass of pulley is 2 kg. Find the acceleration of the object.
(Assume pulley to be a solid disk; g = 10 m/s^2)

వ్యాసార్ధము 25 cm, 2 kg ద్రవ్యరాశి గల ఒక కప్పి (pulley) పై నుండి 2 kg ద్రవ్యరాశి కల ఒక వస్తువు తాడుతో చుట్టబడి వేలాడుతున్నది. వస్తువు యొక్క త్వరణాన్ని కనుక్కోండి
(g = 10 m/s^2 అనుకుని, కప్పి ఒక మన బిల్ల అనుకోండి)



Options :

1. $\frac{2}{3}$ m/s^2
2. $\frac{4}{3}$ m/s^2
3. $\frac{10}{3}$ m/s^2
4. $\frac{20}{3}$ m/s^2

(A) $\frac{2}{3}$ m/s^2
(B) $\frac{4}{3}$ m/s^2
(C) $\frac{10}{3}$ m/s^2
(D) $\frac{20}{3}$ m/s^2

Answer: (D) $\frac{20}{3}$ m/s^2 · Official TGCHE final key

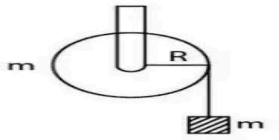
Q208 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

A mass m is supported by a massless string wound around a uniform hollow cylinder of mass m and radius R. If the string does not slip on the cylinder, then with what acceleration will the mass release?
(Assume g = acceleration due to gravity)
(see the figure above)

Question Number : 87 Question Id : 719650247 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

A mass m is supported by a massless string wound around a uniform hollow cylinder of mass m and radius R. If the string does not slip on the cylinder, then with what acceleration will the mass release?
(Assume g = acceleration due to gravity)

m ద్రవ్యరాశి మరియు R వ్యాసార్ధము కలిగిన ఒక బోళా స్థూపం చుట్టూ చుట్టబడిన ద్రవ్యరాశి లేని దారంతో m ద్రవ్యరాశిని మద్దతు (support) చేయబడింది. ఒకవేళ దారం ఆ బోళా స్థూపం పై జారకుండా వున్నట్లయితే, ఆ ద్రవ్యరాశి ఎంత త్వరణముతో విడుదల చేయబడుతుంది?
(g = గురుత్వ త్వరణము అనుకుందాము)



Options :

1. $\frac{2g}{3}$
2. $\frac{g}{2}$
3. $\frac{5g}{6}$
4. g

(A) $\frac{2g}{3}$
(B) $\frac{g}{2}$
(C) $\frac{5g}{6}$
(D) g

Answer: (B) $\frac{g}{2}$ · Official TGCHE final key

Q209 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

A ball of mass 100 g is dropped at time t = 0. A second ball of mass 200 g is dropped from the same point at t = 0.2 s. The distance between the center of mass of two balls and the release point at t = 0.4 s is: (Assume $g = 10\ \mathrm{m/s^2}$)

(A) $0.4\ \mathrm{m}$
(B) $0.5\ \mathrm{m}$
(C) $0.6\ \mathrm{m}$
(D) $0.8\ \mathrm{m}$

Answer: (A) $0.4\ \mathrm{m}$ · Official TGCHE final key

Q210 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

A ball of mass M moving with a speed of 2 m/s hits another ball of mass 1 kg moving in the same direction with a speed of 1 m/s. If the kinetic energy of center of mass is $\frac{4}{3}$ Joule, then the magnitude of M is

(A) $1\ \text{kg}$
(B) $0.25\ \text{kg}$
(C) $0.50\ \text{kg}$
(D) $2\ \text{kg}$

Answer: (C) $0.50\ \text{kg}$ · Official TGCHE final key

Q211 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

From a uniform circular disc of radius 2 cm (its centre of mass is at 'O') a circular portion of radius 1 cm is removed such that the shift in centre of mass is maximum. The disc is now rotated by an angle θ about an axis perpendicular to its plane and passing through 'O'. If the magnitude of displacement of new centre of mass is $\frac{1}{\sqrt{3}}$ cm, then the θ is

(A) 30°
(B) 45°
(C) 60°
(D) 120°

Answer: (D) 120° · Official TGCHE final key

Q212 TS EAMCET 2019 · 6 May · Shift 1 MCQ

A thin circular disc of mass 12 kg and radius 0.5 m rotates with an angular velocity of 100 rad/s. The rotational kinetic energy of the disc is

(A) 12.2 kJ
(B) 5.5 kJ
(C) 9.2 kJ
(D) 7.5 kJ

Answer: (D) 7.5 kJ · Official TGCHE final key

Q213 TS EAMCET 2019 · 6 May · Shift 1 MCQ

The distance between Sun and Earth is 1.6×10^{11} m and the radius of Earth is 6.4×10^{6} m. The ratio of the angular momentum of Earth around the Sun to the angular momentum around its own axis is approximately : (Assume Earth as a solid sphere with uniform mass density and rotates around the Sun in a circular path)

(A) 2.0×10^{2}
(B) 5.1×10^{8}
(C) 4.3×10^{6}
(D) 8.7×10^{12}

Answer: (C) 4.3×10^{6} · Official TGCHE final key

EdLoop EAPCET

Q214 TS EAMCET 2019 · 4 May · Shift 1 MCQ

A solid sphere of mass 5 kg rolls on a plane surface. Find its kinetic energy at an instant when its centre moves with speed 4 m/s

(A) $56\ \mathrm{J}$
(B) $45\ \mathrm{J}$
(C) $75\ \mathrm{J}$
(D) $105\ \mathrm{J}$

Answer: (A) $56\ \mathrm{J}$ · Official TGCHE final key

Q215 TS EAMCET 2019 · 4 May · Shift 2 MCQ

A body rotates about a stationary axis. If the angular deceleration is proportional to square root of angular speed, then the mean angular speed of the body, given ω_0 as the initial angular speed, is

(A) $\frac{\omega_0}{\sqrt{2}}$
(B) $\frac{\omega_0}{4}$
(C) $\frac{\omega_0}{2}$
(D) $\frac{\omega_0}{3}$

Answer: (D) $\frac{\omega_0}{3}$ · Official TGCHE final key

Q216 TS EAMCET 2019 · 4 May · Shift 2 MCQ

A uniform sphere of radius R and mass m is placed on an inclined plane which makes an angle 45° to the horizontal. For which of the following value of coefficient of friction, the sphere rolls without slipping

(A) $\frac{3}{7}$
(B) $\frac{1}{2}$
(C) $\frac{5}{8}$
(D) $\frac{1}{7}$

Options (1) or (2) or (3) were accepted. More than one answer was accepted. · Official TGCHE final key

Q217 TS EAMCET 2019 · 4 May · Shift 2 MCQ

A circular ring of mass 10 kg rolls along a horizontal floor. The center of mass of the ring has a speed 1.5 m/s. The work required to stop the ring is

(A) 10 J

(B) -6 J

(C) 14.5 J

(D) -22.5 J

Answer: (D) -22.5 J · Official TGCHE final key

Q218 TS EAMCET 2019 · 3 May · Shift 1 MCQ

Three balls A, B and C of masses 50 g, 100 g and 150 g respectively are placed at the vertices of an equilateral triangle. The length of each side is 1 m. If A is placed at (0, 0) and B is placed at (1, 0) m, find the coordinates (x, y) for the centre of mass of this system of balls

(A) $\left(\frac{7}{12}, \sqrt{\frac{3}{4}}\right)$ m

(B) $\left(\frac{5}{18}, \sqrt{\frac{1}{4}}\right)$ m

(C) $\left(\frac{7}{12}, \sqrt{\frac{3}{2}}\right)$ m

(D) $\left(\frac{5}{18}, \sqrt{\frac{3}{4}}\right)$ m

Answer: (A) $\left(\frac{7}{12}, \sqrt{\frac{3}{4}}\right)$ m · Official TGCHE final key

Q219 TS EAMCET 2019 · 3 May · Shift 1 MCQ

Three bodies, a ring, a solid disc and a solid sphere roll down the same inclined plane without slipping. The radii of the bodies are identical and they start from rest. If V_S, V_R and V_D are the speeds of the sphere, ring and disc respectively when they reach the bottom, then the correct option is

(A) $V_S > V_R > V_D$

(B) $V_D > V_S > V_R$

(C) $V_R > V_D > V_S$

(D) $V_S > V_D > V_R$

Answer: (D) $V_S > V_D > V_R$ · Official TGCHE final key

Q220 TS EAMCET 2019 · 3 May · Shift 2 MCQ

A solid spherical ball rolls on a horizontal surface at 10 m/s and continues to roll up on an inclined surface as shown in the figure. If the mass of the ball is 11 kg and frictional losses are negligible, the value of 'h' where the ball stops and starts rolling down the inclination is (Assume g = 10 m/s^2)

(see the figure above)

Question Number : 90 Question Id : 7512364410 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A solid spherical ball rolls on a horizontal surface at 10 m/s and continues to roll up on an inclined surface as shown in the figure. If the mass of the ball is 11 kg and frictional losses are negligible, the value of 'h' where the ball stops and starts rolling down the inclination is (Assume $g = 10\ m/s^2$)

ఒక ఘన గోళీయ బంతి క్షితిజ సమాంతర తలంపై 10 m/s తో దొర్లుతూ వాలు తలంపైకి పటంలో చూపిన విధంగా దొర్లుతూ వెళ్ళుచున్నది. బంతి ద్రవ్యరాశి 11 kg మరియు ఘర్షణ వల్ల నష్టాలు విస్మరించినచో, ఆ బంతి వాలుతలంపై ఆగి వెనుకకు దొర్లు బిందువు వద్ద 'h' విలువ ($g = 10\ m/s^2$ గా అనుకొనుము)



Options :

1. 8 m
2. 6 m
3. 7 m
4. 10 m

(A) 8 m
(B) 6 m
(C) 7 m
(D) 10 m

Answer: (C) 7 m · Official TGCHE final key

Q221 TS EAMCET 2019 · 3 May · Shift 2 MCQ

A long slender rod is welded to a thin circular disc of diameter 0.5 m at a point on its circumference. The rod is in the same plane as that of the disc and forms a tangent to the disc. The radius of gyration of the disc about the rod (in m) is

(A) $\frac{1}{4}$
(B) $\frac{\sqrt{5}}{8}$
(C) $\frac{1}{2}$
(D) $2\sqrt{2}$

Answer: (B) $\frac{\sqrt{5}}{8}$ · Official TGCHE final key

Q222 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

A wheel of radius $8\ \text{cm}$ is attached to a support so as to rotate about a horizontal axis through its centre. A string of negligible mass wrapped around its circumference carries a mass of $0.4\ \text{kg}$ attached to its free end. When the mass is released, it descends through $1\ \text{m}$ in 10 seconds, then its moment of inertia is

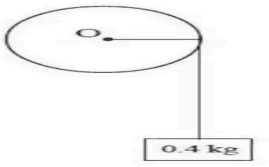
(Acceleration due to gravity $= 10\ \mathrm{ms}^{-2}$)

(see the figure above)

Question Number : 90 Question Id : 1874634730 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A wheel of radius 8 cm is attached to a support so as to rotate about a horizontal axis through its centre. A string of negligible mass wrapped around its circumference carries a mass of 0.4 kg attached to its free end. When the mass is released, it descends through 1 m in 10 seconds, then its moment of inertia is
(Acceleration due to gravity $= 10\ \mathrm{ms}^{-2}$)

8 cm వ్యాసార్ధం కలిగిన ఒక చక్రం, దాని కేంద్రంగుండా పోయే క్షితిజ సమాంతర అక్షం పరంగా భ్రమ్యటానికి వీలుగా ఒక ఆధారానికి బిగించబడినది. పరిగణింపబడని ద్రవ్యరాశి గల ఒక తీగను చక్రం చుట్టూ గుండ్రంగా చుట్టి, తీగ రెండవ కొనకు 0.4 kg ద్రవ్యరాశి వ్రేలాడదీయబడినది. ద్రవ్యరాశిని వదిలినప్పుడు అది 10 సెకనులలో 1 m దూరం అధోగామి చెందినది. అయితే దాని జడత్వ భ్రామకం
(గురుత్వ త్వరణము $= 10\ \mathrm{ms}^{-2}$)



Options :
1. $1.277\ \mathrm{kg\,m^2}$
2. $2.177\ \mathrm{kg\,m^2}$
3. $21.77\ \mathrm{kg\,m^2}$
4. $12.77\ \mathrm{kg\,m^2}$

(A) $1.277\ \mathrm{kg\,m^2}$

(B) $2.177\ \mathrm{kg\,m^2}$

(C) $21.77\ \mathrm{kg\,m^2}$

(D) $12.77\ \mathrm{kg\,m^2}$

Answer: (A) $1.277\ \mathrm{kg\,m^2}$ · Official APSCHE final key

Q223 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

A solid sphere rolls down without slipping on a smooth inclined plane of inclination $\mathrm{Sin}^{-1}(0.42)$. If the acceleration due to gravity is $10\ \mathrm{ms}^{-2}$, the acceleration of the rolling sphere is

(A) $1\ \mathrm{ms}^{-2}$

(B) $2\ \mathrm{ms}^{-2}$

(C) $3\ \mathrm{ms}^{-2}$

(D) $4\ \mathrm{ms}^{-2}$

Answer: (C) $3\ \mathrm{ms}^{-2}$ · Official APSCHE final key

Q224 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

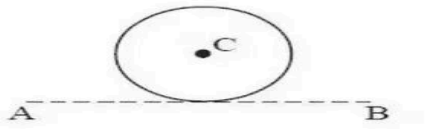
A thin wire of length 'l' having linear density 'ρ' is bent into a circular loop with C as its centre as shown in the figure. The moment of inertia of the loop about the line AB is

(see the figure above)

Question Number : 90 Question Id : 1874634410 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A thin wire of length 'l' having linear density 'ρ' is bent into a circular loop with C as its centre as shown in the figure. The moment of inertia of the loop about the line AB is

పటములో చూపినట్లు, పొడవు 'l', రేఖీయ సాంద్రత 'ρ' గల ఒక సన్నటి తీగ C కేంద్రముగా గల వృత్తముగా వంచబడినది. AB రేఖ పరంగా దాని జడత్వ భ్రామకము



Options :

1. $\frac{5\rho l^3}{16\pi^2}$
2. $\frac{\rho l^2}{16\pi^2}$
3. $\frac{\rho l^2}{8\pi^2}$
4. $\frac{3\rho l^3}{8\pi^2}$

(A) $\frac{5\rho l^3}{16\pi^2}$
(B) $\frac{\rho l^2}{16\pi^2}$
(C) $\frac{\rho l^2}{8\pi^2}$
(D) $\frac{3\rho l^3}{8\pi^2}$

Answer: (D) $\frac{3\rho l^3}{8\pi^2}$ · Official APSCHE final key

Q225 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

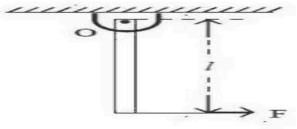
A uniform rod of mass 'm' and length 'l' is pivoted smoothly at 'O' as shown in figure. If a horizontal force 'F' acts at the bottom of the rod and 'ω' is the angular velocity of the rod which is a function of angle of rotation 'θ', then the maximum angular displacement of the rod is (Acceleration due to gravity $= g$)

(see the figure above)

Question Number : 89 Question Id : 1874634569 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A uniform rod of mass 'm' and length 'l' is pivoted smoothly at 'O' as shown in figure. If a horizontal force 'F' acts at the bottom of the rod and 'ω' is the angular velocity of the rod which is a function of angle of rotation 'θ', then the maximum angular displacement of the rod is
(Acceleration due to gravity = g)

పటంలో చూపినట్లుగా 'm' ద్రవ్యరాశి మరియు 'l' పొడవుగల ఒక ఏకరీతి కడ్డీని 'O' వద్ద నున్న కీలకంపై బిగించారు. కడ్డీ అడుగు భాగము వద్ద ఒక క్షితిజ సమాంతర బలం 'F' పనిచేసినట్లయితే, మరియు కడ్డీ యొక్క కోణీయ వేగము 'ω' భ్రమణ కోణము 'θ' ప్రమేయంగా ఉంటే, అప్పుడు కడ్డీ గరిష్ఠ కోణీయ స్థానభ్రంశం
(గురుత్వ త్వరణం = g)



Options :

1. $\theta = 2\sin^{-1}\left(\frac{2F}{mg}\right)$
2. $\theta = 2\cos^{-1}\left(\frac{2F}{mg}\right)$
3. $\theta = 2\tan^{-1}\left(\frac{2F}{mg}\right)$
4. $\theta = 2\cot^{-1}\left(\frac{2F}{mg}\right)$

(A) $\theta = 2\sin^{-1}\left(\frac{2F}{mg}\right)$
(B) $\theta = 2\cos^{-1}\left(\frac{2F}{mg}\right)$
(C) $\theta = 2\tan^{-1}\left(\frac{2F}{mg}\right)$
(D) $\theta = 2\cot^{-1}\left(\frac{2F}{mg}\right)$

Answer: (C) $\theta = 2\tan^{-1}\left(\frac{2F}{mg}\right)$ · Official APSCHE final key

Q226 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

An electric motor of power $75\ \text{W}$ rotates a flywheel of moment of inertia $0.36\ \text{kg m}^2$ at a constant rate of $100\ \text{rad s}^{-1}$. If the power is switched off, the time taken for the wheel to come to rest is

(A) $12\ \text{s}$
(B) $24\ \text{s}$
(C) $36\ \text{s}$
(D) $48\ \text{s}$

Answer: (D) $48\ \text{s}$ · Official APSCHE final key

Q227 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

A fly wheel of mass 1 kg and radius vector $(2\hat{i} + \hat{j} + 2\hat{k})\ \text{m}$ is at rest. When a force $(3\hat{i} + 2\hat{j} - 4\hat{k})\ \text{N}$ acts on it tangentially, it can rotate freely. Then its angular velocity after 4.5 s is

(A) $\frac{2}{9}\sqrt{261}\,\mathrm{rad\,s^{-1}}$
(B) $\frac{3}{2}\sqrt{261}\,\mathrm{rad\,s^{-1}}$
(C) $\sqrt{261}\,\mathrm{rad\,s^{-1}}$
(D) $\frac{5}{9}\sqrt{261}\,\mathrm{rad\,s^{-1}}$

Answer: (C) $\sqrt{261}\,\mathrm{rad\,s^{-1}}$ · Official APSCHE final key

Q228 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

Three identical spheres each of diameter $2\sqrt{3}\,\mathrm{m}$ are kept on a horizontal surface such that each sphere touches the other two spheres. If one of the spheres is removed, then the shift in the position of the centre of mass of the system is

(A) 12 m
(B) 1 m
(C) 2 m
(D) $\frac{3}{2}\,\mathrm{m}$

Answer: (B) 1 m · Official APSCHE final key

Q229 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

A wheel having moment of inertia $2\ \mathrm{kg\,m^2}$ about its axis, rotates at 50 rpm about the same axis. The torque required to stop the wheel in one minute is

(A) $\frac{\pi}{10}\ \mathrm{Nm}$
(B) $\frac{\pi}{18}\ \mathrm{Nm}$
(C) $-\frac{\pi}{12}\ \mathrm{Nm}$
(D) $\frac{3\pi}{8}\ \mathrm{Nm}$

Answer: (B) $\frac{\pi}{18}\ \mathrm{Nm}$ · Official APSCHE final key

Q230 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

The angular retardation of a rotating flywheel is proportional to the angle through which it rotates. If its kinetic energy gets reduced by ΔE while it rotates through an angle 'θ', then

(A) $\Delta E \propto \theta^2$
(B) $\Delta E \propto \sqrt{\theta}$
(C) $\Delta E \propto \theta$
(D) $\Delta E \propto \theta^{\frac{3}{2}}$

Answer: (A) $\Delta E \propto \theta^2$ · Official APSCHE final key

Q231 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

A solid sphere of mass 100 kg and radius 10 m moving in a space becomes a circular disc of radius 20 m in one hour. Then the rate of change of moment of inertia in the process is

(A) $\frac{40}{9}\,\mathrm{kg\,m^2\,s^{-1}}$
(B) $\frac{10}{9}\,\mathrm{kg\,m^2\,s^{-1}}$
(C) $\frac{50}{9}\,\mathrm{kg\,m^2\,s^{-1}}$
(D) $\frac{25}{9}\,\mathrm{kg\,m^2\,s^{-1}}$

Answer: (A) $\frac{40}{9}\,\mathrm{kg\,m^2\,s^{-1}}$ · Official APSCHE final key

Q232 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

A semicircular plate of mass 'm' has radius 'r' and centre 'c'. The centre of mass of the plate is at a distance 'x' from its centre 'c'. Its moment of inertia about an axis passing through its centre of mass and perpendicular to its plane is

(A) $\frac{mr^2}{2}$
(B) $\frac{mr^2}{4}$
(C) $\frac{mr^2}{2}+mx^2$
(D) $\frac{mr^2}{2}-mx^2$

Answer: (D) $\frac{mr^2}{2}-mx^2$ · Official APSCHE final key

Q233 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

Two identical discs are moving with the same kinetic energy. One rolls and the other slides. The ratio of their speeds is

(A) $1:2$
(B) $1:1$
(C) $2:3$
(D) $\sqrt{2}:\sqrt{3}$

Answer: (D) $\sqrt{2}:\sqrt{3}$ · Official APSCHE final key

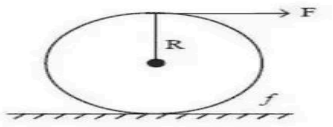
Q234 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

A tangential force 'F' acts at the top of a thin spherical shell of mass 'm' and Radius 'R'. The acceleration of the shell if it rolls without slipping is (f = rolling friction)
(see the figure above)

Question Number : 90 Question Id : 1874633930 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A tangential force 'F' acts at the top of a thin spherical shell of mass 'm' and Radius 'R'. The acceleration of the shell if it rolls without slipping is
(f = rolling friction)

'R' వ్యాసార్ధము, 'm' ద్రవ్యరాశి గల ఒక పలుచని గోళాకార కర్పరము (బోలు గోళము) ఉపరితలంపై 'F' బలం స్పర్శరేఖా దిశలో ప్రయోగించబడినది. గోళం జారకుండా దొర్లుచున్నప్పుడు బోలు గోళం యొక్క త్వరణం
(f = దొర్లుడు ఘర్షణ)



Options :

1. $\frac{5F}{6m}$
2. $\frac{6F}{5m}$
3. $\frac{3F}{2m}$
4. $\frac{F}{6m}$

(A) $\frac{5F}{6m}$
(B) $\frac{6F}{5m}$
(C) $\frac{3F}{2m}$
(D) $\frac{F}{6m}$

Answer: (B) $\frac{6F}{5m}$ · Official APSCHE final key

Q235 TS EAMCET 2018 · 7 May · Shift 1 MCQ

If a disc of mass M and radius R rotates with an angular acceleration 'a', the torque acting on the disc

(A) MR^2a
(B) $\frac{MR^2a}{2}$
(C) $\frac{2MR^2a}{5}$
(D) $\frac{MR^2a}{12}$

Answer: (B) $\frac{MR^2a}{2}$ · The council's preliminary key

Q236 TS EAMCET 2018 · 7 May · Shift 1 MCQ

Consider a sphere of mass M and radius R centered at origin. The density of material of the sphere is $\rho = Ar^{\alpha}$, where r is the radial distance, α and A are constants. If the moment of inertia of the sphere about the axis passing through center is $\frac{4}{7}MR^2$, the value of α is

(A) 3
(B) 6
(C) 9
(D) 12

Answer: (C) 9 · The council's preliminary key

Q237 TS EAMCET 2018 · 5 May · Shift 1 MCQ

A 30 kg boy stands at the far edge of a floating plank whose near edge is against the shore of a river. The plank is 10 m long and weighs 10 kg. If the boy walks to the near edge of the plank, how far from the shore does the plank move

(A) 7m
(B) 8m
(C) 7.5m
(D) 15m

Answer: (C) 7.5m · The council's preliminary key

Q238 TS EAMCET 2018 · 5 May · Shift 1 MCQ

A uniform cylinder of radius 1 m, mass 1 kg spins about its axis with an angular velocity of 20 rad/sec. At certain moment the cylinder is placed into a corner as shown in the figure. The coefficient of friction between the horizontal wall and the cylinder is μ, where as the vertical wall is frictionless. If the number of rounds made by the cylinder is 5 before it stops, the value of μ is:
(Acceleration due to gravity $g = 10\ \mathrm{m/sec^2}$)

(A) $\frac{3}{\pi}$
(B) $\frac{2}{\pi}$
(C) $\frac{1}{\pi}$
(D) $\frac{0.4}{\pi}$

Answer: (C) $\frac{1}{\pi}$ · The council's preliminary key

Q239 TS EAMCET 2018 · 5 May · Shift 2 MCQ

The masses and positions (in rectangular coordinates) of four particles are as follows: $1\ \mathrm{kg}$ at (a, a), $2\ \mathrm{kg}$ at $(-a, a)$, $3\ \mathrm{kg}$ at $(-a, -a)$ and $4\ \mathrm{kg}$ at $(a, -a)$. The position vector of the centre of mass of the system of four particles is

EdLoop EAPCET

(A) $-4a\hat{i}$

(B) $-4a\hat{i} - 4a\hat{j}$

(C) 0

(D) $-0.4a\hat{j}$

Answer: (D) $-0.4a\hat{j}$ · The council's preliminary key

Q240 TS EAMCET 2018 · 5 May · Shift 2 MCQ

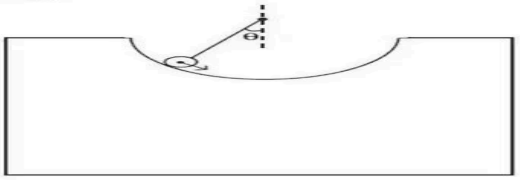
A solid sphere is rolling without slipping on a semi-circular track of radius $10\ \mathrm{m}$ as shown in the figure. The radius of solid sphere is much smaller than the radius of semicircular track. At the lowest point, it has a velocity $10\ \mathrm{m/sec}$. To what maximum angle θ from the vertical will the sphere travel before it comes back down? Neglect the rolling friction between the sphere and the track. (Take $g = 10\ \mathrm{m/sec^2}$)

(see the figure above)

Question Number : 92 Question Id : 49288632332 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct : 1 Wrong : 0

A solid sphere is rolling without slipping on a semi-circular track of radius 10 m as shown in the figure. The radius of solid sphere is much smaller than the radius of semicircular track. At the lowest point, it has a velocity 10 m/sec. To what maximum angle θ from the vertical will the sphere travel before it comes back down? Neglect the rolling friction between the sphere and the track. (Take $g = 10\ \mathrm{m/sec^2}$)

ఒక ఘనగోళము పటంలో చూపిన విధంగా 10 m వ్యాసార్ధంగల అర్ధవృత్తాకార బాటలో జారకుండా దొర్లుతుంది. ఘనగోళపు వ్యాసార్ధము అర్ధవృత్తాకార బాట వ్యాసార్ధాని కంటే చాలా చిన్నది. నిమ్న బిందువు వద్ద దాని వేగం 10 m/sec. గోళము తిరోగమనదిశలో (వెనకకు) దొర్లుటకు రావడానికి ముందు అది ఊర్ధ్వదిశతో చేయు గరిష్ఠ కోణము (బాటకు గోళానికి మధ్యగల రోలింగ్ ఘర్షణను విస్మరించుము. $g = 10\ \mathrm{m/sec^2}$ గా తీసుకొనుము)



Options :

1. $\sin^{-1}\left(\frac{3}{5}\right)$
2. $\sin^{-1}\left(\frac{3}{7}\right)$
3. $\cos^{-1}\left(\frac{3}{10}\right)$
4. $\cos^{-1}\left(\frac{1}{3}\right)$

(A) $\sin^{-1}\left(\frac{3}{5}\right)$

(B) $\sin^{-1}\left(\frac{3}{7}\right)$

(C) $\cos^{-1}\left(\frac{3}{10}\right)$

(D) $\cos^{-1}\left(\frac{1}{3}\right)$

Answer: (C) $\cos^{-1}\left(\frac{3}{10}\right)$ · The council's preliminary key

Q241 TS EAMCET 2018 · 4 May · Shift 1 MCQ

A solid sphere of radius R makes a perfect rolling down on a plane which is inclined to the horizontal axis at an angle θ. If the radius of gyration is 'k', then its acceleration is

(A) $\frac{g\sin\theta}{\left(1+\frac{k^2}{R^2}\right)}$
(B) $\frac{g\sin\theta}{(R^2+k^2)}$
(C) $\frac{g\sin\theta}{2(R^2+k^2)}$
(D) $\frac{g\sin\theta}{2\left(1+\frac{k^2}{R^2}\right)}$

Answer: (A) $\frac{g\sin\theta}{\left(1+\frac{k^2}{R^2}\right)}$ · The council's preliminary key

Q242 TS EAMCET 2018 · 4 May · Shift 2 MCQ

A uniform disk of mass 100 kg and radius 2 m is rotating at 1 rad/s about a perpendicular axis passing through its center. A boy of mass 60 kg, standing at the center of the disk suddenly jumps to a point which is 1 m from the center of the disk. The final angular velocity of the boy (in rad/s) is

(A) 0.77
(B) 0.5
(C) 1
(D) 2

Answer: (A) 0.77 · The council's preliminary key

Q243 TS EAMCET 2018 · 4 May · Shift 2 MCQ

A force $\vec{F}_1 = A\,\hat{j}$ is applied to a point whose radius vector $\vec{r}_1 = a\,\hat{i}$ while a force $\vec{F}_2 = B\,\hat{i}$ is applied to the point whose radius vector $\vec{r}_2 = b\,\hat{j}$. Both the radius vectors are determined relative to the origin of the coordinate axes 'O'. The moment of the force relative to 'O' is

(A) $(aA - bB)\hat{k}$
(B) $(aA - bB)\hat{j}$
(C) $(ab - AB)\hat{k}$
(D) $(aB - bA)\hat{j}$

Answer: (A) $(aA - bB)\hat{k}$ · The council's preliminary key

Q244 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

A circular disc of radius 'R' is removed from one end of a bigger circular disc of radius '2R'. The centre of mass of the new disc is at a distance 'αR' from the centre of the bigger disc. The value of 'α' is

(A) $\frac{1}{2}$
(B) $\frac{1}{3}$
(C) $\frac{1}{4}$
(D) $\frac{1}{6}$

Answer: (B) $\frac{1}{3}$ · The council's preliminary key

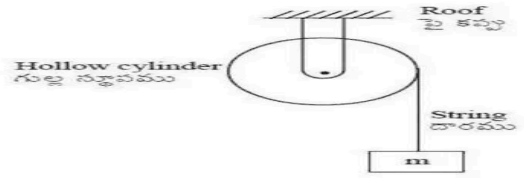
Q245 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

In the figure shown, acceleration with which the mass 'm' falls down when released is (consider the string to be massless, g-acceleration due to gravity)
(see the figure above)

Question Number : 90 Question Id : 4557344410 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the figure shown, acceleration with which the mass 'm' falls down when released is (consider the string to be massless, g-acceleration due to gravity)

పటములో చూపిన అమరికలో, ద్రవ్యరాశి 'm' ను విడుదల చేసినప్పుడు, అది క్రిందికి పడునప్పుడు త్వరణము (ద్రవ్యరాశి రహిత దారమును ఊహించుకొనుము, g - గురుత్వ త్వరణము)



Options :
1. $\frac{2g}{3}$
2. $\frac{g}{2}$
3. $\frac{5g}{6}$
4. g

(A) $\frac{2g}{3}$
(B) $\frac{g}{2}$
(C) $\frac{5g}{6}$
(D) g

Answer: (B) $\frac{g}{2}$ · The council's preliminary key

Q246 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

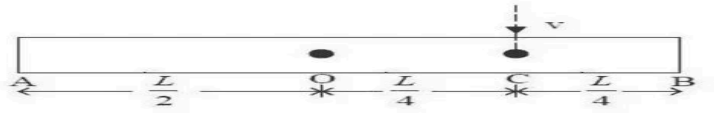
A uniform rod AB of length 'L' and mass 'M' is pivoted at the centre 'O' in such a way that it can rotate in the vertical plane as shown in the figure. An insect of the same mass falls vertically with speed 'v' on the horizontal rod at a point 'C' which is the midpoint of O and B. Immediately after falling, the insect moves towards the end B such that the rod rotates with constant angular velocity 'ω

'. If the insect reaches the end B when the rod has turned through 90°, then the speed v is _____
(see the figure above)

Question Number : 90 Question Id : 4557344570 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A uniform rod AB of length 'L' and mass 'M' is pivoted at the centre 'O' in such a way that it can rotate in the vertical plane as shown in the figure. An insect of the same mass falls vertically with speed 'v' on the horizontal rod at a point 'C' which is the midpoint of O and B. Immediately after falling, the insect moves towards the end B such that the rod rotates with constant angular velocity 'ω'. If the insect reaches the end B when the rod has turned through 90°, then the speed v is _____

'M' ద్రవ్యరాశి మరియు 'L' పొడవు గల ఒక ఏకరీతి కడ్డీ AB ని నిలువు తలంలో భ్రమణం చేయుటకు వీలుగా కడ్డీ కేంద్రం 'O' ను ఒక కీలకంనకు పటంలో చూపినట్లుగా అమర్చారు. అదే ద్రవ్యరాశి గల ఒక కీటకం క్షితిజ సమాంతరంగా ఉన్న కడ్డీపై O మరియు B ల మధ్య బిందువు అయిన 'C' బిందువు వద్ద క్షితిజ లంబంగా v వడితో పడినది. పడిన వెంటనే కీటకం 'B' చివర వైపుకు చలిస్తూ ఉంటే కడ్డీ స్థిర కోణీయ వేగం 'ω' తో భ్రమణం చేస్తుంది. కీటకం B ను చేరినప్పుడు కడ్డీ 90° కోణం భ్రమణం చేస్తే, వడి v _____



Options :
1. $\frac{12}{7}gL$
2. $\frac{7}{12}\sqrt{2gL}$
3. $\frac{7}{12}\sqrt{gL}$
4. $\frac{12}{7}\sqrt{gL}$

(A) $\frac{12}{7}gL$
(B) $\frac{7}{12}\sqrt{2gL}$
(C) $\frac{7}{12}\sqrt{gL}$
(D) $\frac{12}{7}\sqrt{gL}$

Answer: (B) $\frac{7}{12}\sqrt{2gL}$ · The council's preliminary key

Q247 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

A solid sphere of lithium is rotating with angular frequency 'ω' about an axis passing through its diameter. If its temperature is raised by $50\ ^\circ\mathrm{C}$ then its new angular frequency is
($\alpha_{\text{lithium}} = 60 \times 10^{-5}\ ^\circ\mathrm{C}^{-1}$)

(A) $0.99\,\omega$
(B) $0.73\,\omega$
(C) $0.83\,\omega$
(D) $0.94\,\omega$

Answer: (D) $0.94\,\omega$ · The council's preliminary key

Q248 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

A particle of mass 4M which is initially at rest explodes into three pieces of masses M, M and 2M. The equal masses move along X- and Y- axes with velocities $4\ \mathrm{ms}^{-1}$ and $6\ \mathrm{ms}^{-1}$ respectively. The magnitude of the velocity of the heavier mass is

(A) $\sqrt{17}\ \mathrm{ms}^{-1}$
(B) $2\sqrt{13}\ \mathrm{ms}^{-1}$
(C) $\sqrt{13}\ \mathrm{ms}^{-1}$
(D) $\frac{\sqrt{13}}{2}\ \mathrm{ms}^{-1}$

Answer: (C) $\sqrt{13}\ \mathrm{ms}^{-1}$ · The council's preliminary key

Q249 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

The moment of inertia of a body about a given axis is $12\ \mathrm{kgm}^2$. Initially the body is at rest. In order to produce a rotational kinetic energy of 15000 J, an angular acceleration of $10\ \mathrm{rads}^{-2}$ must be applied about that axis for a duration of _____

(A) 2 s
(B) 4 s
(C) 10 s
(D) 5 s

Answer: (D) 5 s · The council's preliminary key

Q250 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

A light rope is wound around a hollow cylinder of mass 4 kg and radius 40 cm. If the rope is pulled with a force of 40 N, it's angular acceleration is _____

(A) $0.40\ \mathrm{rads}^{-2}$
(B) $0.25\ \mathrm{rads}^{-2}$
(C) $25\ \mathrm{rads}^{-2}$
(D) $40\ \mathrm{rads}^{-2}$

Answer: (C) $25\ \mathrm{rads}^{-2}$ · The council's preliminary key

Q251 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

A particle of mass 15 kg is moving with a uniform speed of $8\ \mathrm{ms}^{-1}$ in $x-y$ plane along the line $3y = 4x + 10$, then the magnitude of its angular momentum about the origin in $\mathrm{kg\ m^2 s^{-1}}$ is _____ ($\sin 53^\circ = \frac{4}{5}$)

(A) 240
(B) 80
(C) 120
(D) 280

Answer: (A) 240 · The council's preliminary key

Q252 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

An empty bucket of mass 1 kg attached by a light cord passed over a pulley of a water well is released from rest. If the pulley assembly is assumed to be a uniform solid cylinder of mass 8 kg and free to rotate about its axis without any friction, then the speed of the bucket as it hits the water 16 m below is
($g = 10\ \text{ms}^{-2}$)

(A) $4\ \text{ms}^{-1}$
(B) $8\ \text{ms}^{-1}$
(C) $16\ \text{ms}^{-1}$
(D) $20\ \text{ms}^{-1}$

Answer: (B) $8\ \text{ms}^{-1}$ · The council's preliminary key

Q253 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

A rigid metallic sphere is spinning around its own axis in the absence of external torque. If the temperature is raised, its volume increases by 9%. The change in its angular speed is

(A) increases by 9%
(B) decreases by 9%
(C) increases by 6%
(D) decreases by 6%

Answer: (D) decreases by 6% · The council's preliminary key

Q254 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

Two particles of masses in the ratio 1 : 2 are placed along a vertical line. The lighter particle is raised through a height of 9 cm. To raise the centre of mass of the system by 2 cm, the heavier particle should be _____

(A) moved 1.5 cm downward
(B) moved 2 cm upward
(C) moved 1.5 cm upward
(D) moved 2 cm downward

Answer: (A) moved 1.5 cm downward · The council's preliminary key

Q255 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

A solid sphere and a ring of same radius roll down an inclined plane without slipping. Both start from rest from the top of the inclined plane. If the sphere and the ring reach the bottom of the inclined plane with velocities v_s and v_r respectively, then $\frac{v_r^2}{v_s^2}$ is

(A) 0.2
(B) 0.5
(C) 0.7
(D) 0.9

Answer: (C) 0.7 · The council's preliminary key

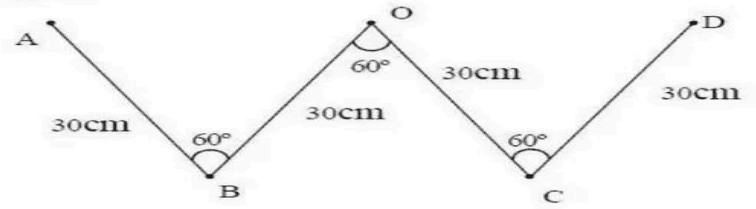
Q256 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

A uniform thin rod of 120 cm length and 1600 g mass is bent as shown in the figure. The moment of inertia of the bent rod about an axis passing through the point 'O' and perpendicular to the plane of the paper is _____ $\mathrm{kg\,m^2}$.
(see the figure above)

Question Number : 89 Question Id : 1017174569 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A uniform thin rod of 120 cm length and 1600 g mass is bent as shown in the figure. Tl moment of inertia of the bent rod about an axis passing through the point 'O' ar perpendicular to the plane of the paper is _____ kg m^2.

120 cm పొడవు, 1600 g ద్రవ్యరాశి గల ఒక ఏకరీతి సన్నటి కడ్డీ పటంలో చూపిన విధంగా వంచబడిం కాగితపు తలానికి లంబంగా 'O' బిందువు గుండా పోవు అక్షం దృష్ట్యా వంచబడిన కడ్డీ యొక్క జడ భ్రామకం _____ kg m^2



Options :
1. 0.120
2. 0.084
3. 0.360
4. 0.018

(A) 0.120
(B) 0.084
(C) 0.360
(D) 0.018

Answer: (B) 0.084 · The council's preliminary key

Q257 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

A solid sphere is projected up along an inclined plane of inclination 30° with the horizontal with a speed of $4\ \mathrm{ms^{-1}}$. If it rolls without slipping, the maximum distance traversed by it is _____ ($g = 10\ \mathrm{ms^{-2}}$)

(A) $1.12\ \mathrm{m}$
(B) $22.4\ \mathrm{m}$
(C) $112\ \mathrm{m}$
(D) $2.24\ \mathrm{m}$

Answer: (D) $2.24\ \mathrm{m}$ · The council's preliminary key

Q258 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

Three circular discs of same material and same thickness of radii r, 2r and 3r are placed on a horizontal plane such that their centres lie along a straight line. The radius of the middle disc is 2r and it touches the other two discs. The distance of the centre of mass of the system from the centre of the smaller disc is _____.

(A) $2r$
(B) $4r$
(C) $6r$
(D) $8r$

Answer: (C) $6r$ · The council's preliminary key

Q259 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

A solid sphere rolls down without slipping on an inclined plane of angle of inclination $\sin^{-1}\left(\frac{21}{50}\right)$. If the acceleration due to gravity is $10\ \mathrm{ms}^{-2}$, the acceleration of the rolling sphere is _____

(A) $3\ \mathrm{ms}^{-2}$
(B) $7\ \mathrm{ms}^{-2}$
(C) $10\ \mathrm{ms}^{-2}$
(D) $2\ \mathrm{ms}^{-2}$

Answer: (A) $3\ \mathrm{ms}^{-2}$ · The council's preliminary key

Q260 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

A solid sphere of mass 2 kg and radius 1 m is free to rotate about an axis passing through its centre. A constant tangential force 'F' is required to rotate the sphere with 10 rad s^{-1} in 2 s starting from rest. Then the value of F is _____

(A) $2\ \mathrm{N}$
(B) $4\ \mathrm{N}$
(C) $8\ \mathrm{N}$
(D) $10\ \mathrm{N}$

Answer: (B) $4\ \mathrm{N}$ · The council's preliminary key

EdLoop EAPCET

Q261 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

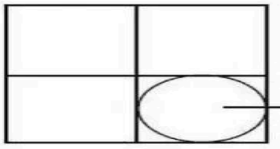
A uniform square plate has a side of length 2R. A circular piece of maximum possible area is cut and removed from one of the quadrants of the plate as shown in the figure. Shift in the centre of mass of the plate is.

(see the figure above)

Question Number : 89 Question Id : 1017174409 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A uniform square plate has a side of length 2R. A circular piece of maximum possible ar is cut and removed from one of the quadrants of the plate as shown in the figure. Shift in t centre of mass of the plate is.

2R భుజము పొడవు గల ఏకరీతి చతురస్రాకార పలక కలదు. పటంలో చూపినట్లుగా పలక యొ నాల్గవ భాగము నుండి గరిష్ఠ వైశాల్యముగల వృత్తాకార ముక్కను కత్తిరించి తొలగిస్తే, పలక ద్రవ్యర కేంద్రములోని విస్థాపము (Shift)



Options :

1. $\frac{\pi R}{\sqrt{2}(16-\pi)}$
2. $\frac{R}{(16-\pi)}$
3. $\frac{R}{\pi(16-\pi)}$
4. $\frac{R\pi}{(16-\pi)}$

(A) $\frac{\pi R}{\sqrt{2}(16-\pi)}$

(B) $\frac{R}{(16-\pi)}$

(C) $\frac{R}{\pi(16-\pi)}$

(D) $\frac{R\pi}{(16-\pi)}$

Answer: (A) $\frac{\pi R}{\sqrt{2}(16-\pi)}$ · The council's preliminary key

Q262 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

A small hole is made in a circular disc of mass 'M' and radius 'R' at a distance of $\frac{R}{4}$ from the centre. The disc is supported on a horizontal peg through this hole. The moment of inertia of the disc about the horizontal peg is

(A) $\frac{9MR^2}{16}$
(B) $\frac{5MR^2}{4}$
(C) $\frac{5MR^2}{16}$
(D) $\frac{MR^2}{9}$

Answer: (A) $\frac{9MR^2}{16}$ · The council's preliminary key

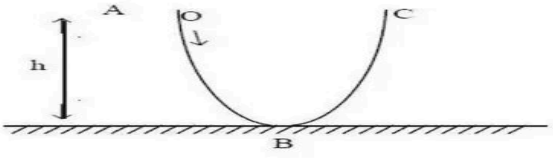
Q263 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

A hollow sphere rolls down a parabolic path ABC from a height 'h' as shown in the figure. Portion AB of the path is rough while BC is smooth. The height raised by the sphere in BC is
(see the figure above)

Question Number : 90 Question Id : 1017173770 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A hollow sphere rolls down a parabolic path ABC from a height 'h' as shown in the figure. Portion AB of the path is rough while BC is smooth. The height raised by the sphere in BC is

'h' ఎత్తు నుండి ఒక బోలు గోళము పటములో చూపిన విధముగా ABC పరావలయ పథం వెంబడి దొర్లుచున్నది. AB పథము గరుకుగాను, BC పథము నునుపుగా కలదు. అయిన BC పథంలో గోళం చేరు ఎత్తు.



Options :
1. $\frac{3h}{5}$
2. $\frac{5h}{7}$
3. $\frac{5h}{3}$
4. $\frac{7h}{5}$

(A) $\frac{3h}{5}$
(B) $\frac{5h}{7}$
(C) $\frac{5h}{3}$
(D) $\frac{7h}{5}$

Answer: (A) $\frac{3h}{5}$ · The council's preliminary key

Q264 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

At a certain height, a body at rest explodes into two equal fragments with one fragment receiving a horizontal velocity of $10\sqrt{3}\ \mathrm{ms}^{-1}$. The horizontal distance between the two fragments, when their

velocity vectors are inclined at 60° relative to each other is ($g = 10\ \mathrm{ms}^{-2}$)

(A) $40\sqrt{3}\ \mathrm{m}$

(B) $60\sqrt{3}\ \mathrm{m}$

(C) $240\sqrt{3}\ \mathrm{m}$

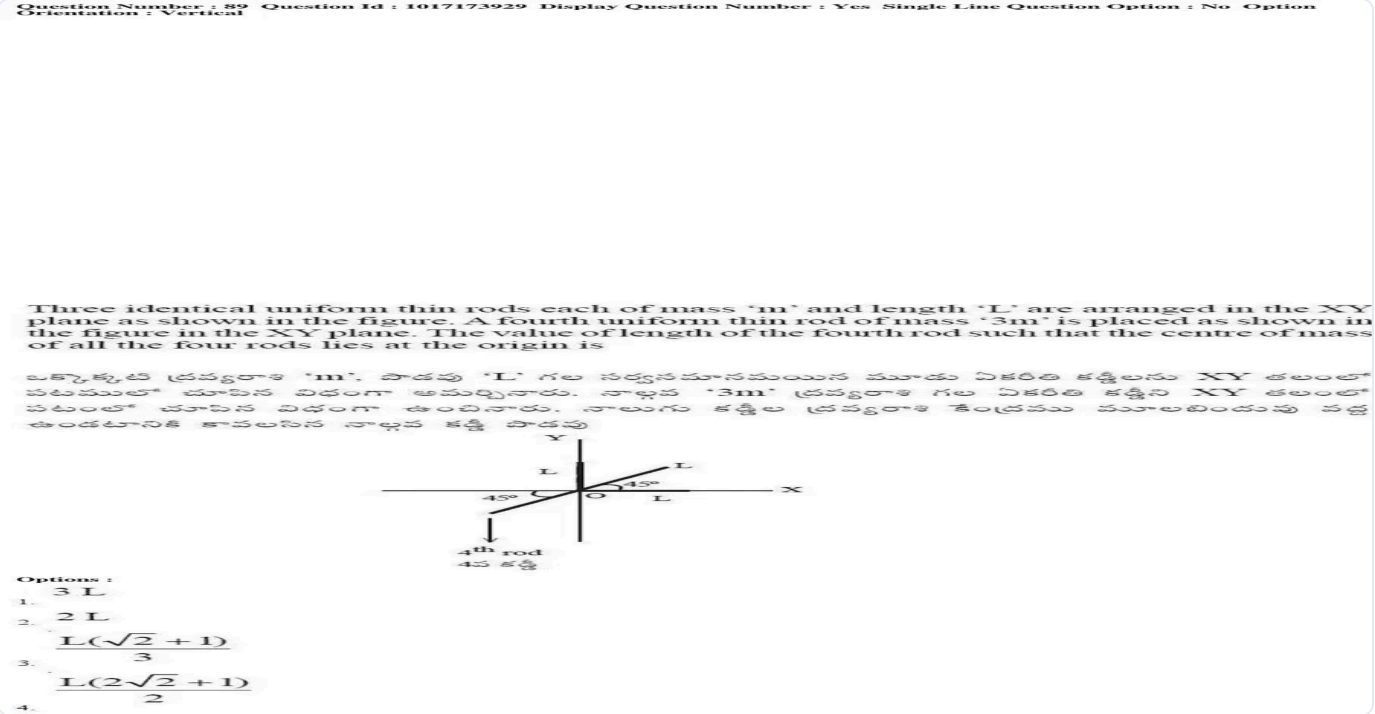
(D) $480\sqrt{3}\ \mathrm{m}$

Answer: (B) $60\sqrt{3}\ \mathrm{m}$ · The council's preliminary key

Q265 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

Three identical uniform thin rods each of mass 'm' and length 'L' are arranged in the XY plane as shown in the figure. A fourth uniform thin rod of mass '3m' is placed as shown in the figure in the XY plane. The value of length of the fourth rod such that the centre of mass of all the four rods lies at the origin is

(see the figure above)



(A) $3L$

(B) $2L$

(C) $\frac{L(\sqrt{2}+1)}{3}$

(D) $\frac{L(2\sqrt{2}+1)}{2}$

Answer: (C) $\frac{L(\sqrt{2}+1)}{3}$ · The council's preliminary key

Q266 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

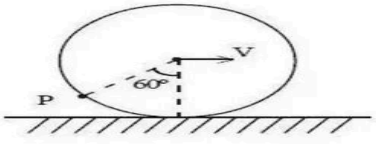
A hoop rolls on a horizontal ground without slipping with a linear speed $10\ \mathrm{ms}^{-1}$. Speed of a particle at a point P on the circumference of the hoop as shown in the figure is

(see the figure above)

Question Number : 90 Question Id : 1017173930 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A hoop rolls on a horizontal ground without slipping with a linear speed $10\ ms^{-1}$. Speed of a particle at a point P on the circumference of the hoop as shown in the figure is

ఒక క్షితిజ సమాంతర తలంపై ఒక కంకణం $10\ ms^{-1}$ రేఖీయ వడితో జారకుండ దొర్లుచున్నది. కంకణం ఉపరితలముపై P బిందువు వద్ద ఒక కణం పటములో చూపిన విధంగా ఉన్నపుడు ఆ కణం వడి



Options :

1. $10\ ms^{-1}$
2. $5\ ms^{-1}$
3. $20\ ms^{-1}$
4. $10\sqrt{2}\ ms^{-1}$

(A) $10\ \text{ms}^{-1}$

(B) $5\ \text{ms}^{-1}$

(C) $20\ \text{ms}^{-1}$

(D) $10\sqrt{2}\ \text{ms}^{-1}$

Answer: (A) $10\ \text{ms}^{-1}$ · The council's preliminary key

Q267 TS EAMCET 2016 · 15 May · Offline MCQ

A system of two particles is having masses m_1 and m_2. If the particle of mass m_1 is pushed towards the center of mass of particles through a distance d, by what distance the particle of mass m_2 should be moved so as to keep the centre of mass of particles at the original position ?

(A) $\frac{m_1}{m_1+m_2}d$

(B) d

(C) $\frac{m_1}{m_2}d$

(D) $\frac{m_2}{m_1}d$

Answer: (C) $\frac{m_1}{m_2}d$ · Official TGCHE final key

Q268 TS EAMCET 2016 · 15 May · Offline MCQ

A thin uniform circular disc of mass M and radius R is rotating in a horizontal plane about an axis passing through its centre and perpendicular to its plane with an angular velocity ω. Another disc of same thickness and radius but of mass $\frac{1}{8}M$ is placed gently on the first disc co-axially. The angular velocity of the system is now

(A) $\frac{8}{9}\omega$
(B) $\frac{5}{9}\omega$
(C) $\frac{1}{3}\omega$
(D) $\frac{2}{9}\omega$

Answer: (A) $\frac{8}{9}\omega$ · Official TGCHE final key

Q269 AP EAMCET 2016 · 29 Apr · Offline MCQ

Three identical uniform thin metal rods form the three sides of an equilateral triangle. If the moment of inertia of the system of these three rods about an axis passing through the centroid of the triangle and perpendicular to the plane of the triangle is 'n' times the moment of inertia of one rod separately about an axis passing through the centre of the rod and perpendicular to its length, the value of 'n' is

(A) 3
(B) 6
(C) 9
(D) 12

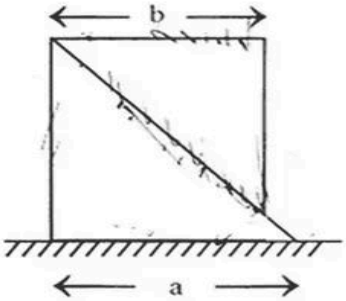
Answer: (B) 6 · The council's preliminary key

Q270 AP EAMCET 2016 · 29 Apr · Offline MCQ

Two smooth and similar right angled prisms are arranged on a smooth horizontal plane as shown in the figure. The lower prism has a mass '3' times the upper prism. The prisms are held in an initial position as shown and are then released. As the upper prism touches the horizontal plane, the distance moved by the lower prism is *(see the figure above)*

90. Two smooth and similar right angled prisms are arranged on a smooth horizontal plane as shown in the figure. The lower prism has a mass '3' times the upper prism. The prisms are held in an initial position as shown and are then released. As the upper prism touches the horizontal plane, the distance moved by the lower prism is

రెండు నున్నని ఒకే రీతి లంబకోణ త్రిభుజాకార పట్టకాలను పటంలో చూపినట్లుగా నున్నని క్షితిజ సమాంతర తలంపై అమర్చారు. క్రింది పట్టకము యొక్క ద్రవ్యరాశి పై పట్టకం యొక్క ద్రవ్యరాశికి 3 రెట్లు ఉన్నది. మొదటగా పట్టకాలు పటంలో చూపిన స్థానాలలో ఉన్నవి. పై పట్టకం క్షితిజ సమాంతర తలాన్ని తాకేలోపు క్రింది పట్టకం ప్రయాణించిన దూరం



(1) $a-b$ (2) ~~$\frac{a-b}{3}$~~ (3) $\frac{b-a}{2}$ (4) $\frac{a-b}{4}$

(A) $a - b$

(B) $\frac{a-b}{3}$

(C) $\frac{b-a}{2}$

(D) $\frac{a-b}{4}$

Answer: (D) $\frac{a-b}{4}$ · The council's preliminary key

Q271 AP EAMCET 2014 · 22 May · Offline MCQ

A wheel which is initially at rest is subjected to a constant angular acceleration about its axis. It rotates through an angle of 15° in time t secs. The increase in angle through which it rotates in the next 2t secs is

(A) 90°

(B) 120°

(C) 30°

(D) 45°

Answer: (B) 120° · The council's preliminary key

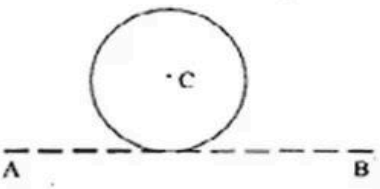
Q272 AP EAMCET 2014 · 22 May · Offline MCQ

A thin wire of length ℓ having linear density ρ is bent into a circular loop with C as its centre, as shown in figure. The moment of inertia of the loop about the line AB is

(see the figure above)

102. A thin wire of length l having linear density ρ is bent into a circular loop with C as its centre, as shown in figure. The moment of inertia of the loop about the line AB is

పటములో చూపినట్లు, పొడవు l మరియు రేఖీయ సాంద్రత ρ గల ఒక సన్నటి తీగను C కేంద్రముగా గల వృత్తముగా వంచబడినది. AB రేఖ వెంబడి దాని జడత్వ భ్రమకము



(1) $\frac{5\rho\ell^3}{16\pi^2}$

(2) $\frac{\rho\ell^3}{16\pi^2}$

(3) $\frac{\rho\ell^3}{8\pi^2}$

(4) $\frac{3\rho\ell^3}{8\pi^2}$

(A) $\frac{5\rho\ell^3}{16\pi^2}$
(B) $\frac{\rho\ell^3}{16\pi^2}$
(C) $\frac{\rho\ell^3}{8\pi^2}$
(D) $\frac{3\rho\ell^3}{8\pi^2}$

Answer: (D) $\frac{3\rho\ell^3}{8\pi^2}$ · The council's preliminary key

Q273 AP EAMCET 2013 · 10 May · Offline MCQ

Two bodies of mass 4 kg and 5 kg are moving along east and north directions with velocities 5 m/s and 3 m/s respectively. Magnitude of the velocity of centre of mass of the system is

(A) $\frac{25}{9}$ m/s
(B) $\frac{9}{25}$ m/s
(C) $\frac{41}{9}$ m/s
(D) $\frac{16}{9}$ m/s

Answer: (A) $\frac{25}{9}$ m/s · The council's preliminary key

Q274 AP EAMCET 2013 · 10 May · Offline MCQ

Moment of inertia of a body about an axis is $4\ \mathrm{kgm^2}$. The body is initially at rest and a torque of $8\ \mathrm{Nm}$ starts acting on it along the same axis. Work done by the torque in 20 sec, in Joules, is

(A) 40
(B) 640
(C) 2560
(D) 3200

Answer: (D) 3200 · The council's preliminary key

Q275 AP EAMCET 2013 · 10 May · Offline MCQ

A uniform circular disc of radius R, lying on a frictionless horizontal plane is rotating with an angular velocity 'ω' about its own axis. Another identical circular disc is gently placed on the top of the first disc coaxially. The loss in rotational kinetic energy due to friction between the two discs, as they acquire common angular velocity is (I is Moment of Inertia of the disc)

(A) $\frac{1}{8}I\omega^2$
(B) $\frac{1}{4}I\omega^2$
(C) $\frac{1}{2}I\omega^2$
(D) $I\omega^2$

Answer: (B) $\frac{1}{4}I\omega^2$ · The council's preliminary key

Q276 AP EAMCET 2012 · 12 May · Offline MCQ

Choose the correct statement
A) The position of centre of mass of a system is dependent on the choice of co-ordinate system.
B) Newton's second law of motion is applicable to the centre of mass of the system.
C) When no external force acts on a body, the acceleration of centre of mass is zero.
D) Internal forces can change the state of centre of mass.

(A) Both (A) and (B) are correct
(B) Both (B) and (C) are wrong
(C) Both (A) and (C) are wrong
(D) Both (A) and (D) are wrong

Answer: (D) Both (A) and (D) are wrong · Official APSCHE final key

Q277 AP EAMCET 2012 · 12 May · Offline MCQ

Assertion (A) : The moment of inertia of a steel sphere is larger than the moment of inertia of a wooden sphere of same radius.
Reason (R) : Moment of inertia is independent of mass of the body.
The correct one is

(A) Both (A) and (R) are true, and (R) is the correct explanation of (A)
(B) Both (A) and (R) are true, but (R) is not the correct explanation of (A)
(C) (A) is true but (R) is wrong
(D) (A) is wrong but (R) is true

Answer: (C) (A) is true but (R) is wrong · Official APSCHE final key

Q278 AP EAMCET 2012 · 12 May · Offline MCQ

Two solid spheres A and B each of radius 'R' are made of materials of densities ρ_A and ρ_B respectively. Their moments of inertia about a diameter are I_A and I_B respectively. The value of $\frac{I_A}{I_B}$ is

(A) $\sqrt{\frac{\rho_A}{\rho_B}}$
(B) $\sqrt{\frac{\rho_B}{\rho_A}}$
(C) $\frac{\rho_A}{\rho_B}$
(D) $\frac{\rho_B}{\rho_A}$

Answer: (C) $\frac{\rho_A}{\rho_B}$ · Official APSCHE final key

Q279 AP EAMCET 2011 · 8 May · Offline MCQ

A circular disc of radius 'R' is removed from a bigger circular disc of radius '2R' such that the circumferences of the discs touch. The centre of mass of the new disc is at a distance 'αR' from the centre of the bigger disc. The value of 'α' is .

(A) $\frac{1}{2}$
(B) $\frac{1}{3}$
(C) $\frac{1}{4}$
(D) $\frac{1}{6}$

Answer: (B) $\frac{1}{3}$ · The council's preliminary key

Q280 AP EAMCET 2011 · 8 May · Offline MCQ

Two uniform circular discs having the same mass and the same thickness but different radii are made from different materials. The disc with the smaller rotational inertia is :

(A) the one made from the more dense material
(B) the one made from the less dense material
(C) the disc with the larger angular velocity
(D) the disc with the larger torque

Answer: (A) the one made from the more dense material · The council's preliminary key

Q281 AP EAMCET 2011 · 8 May · Offline MCQ

A thin hollow sphere of mass 'm' is completely filled with a liquid of mass 'm'. When the sphere rolls with a velocity 'v', kinetic energy of the system is (neglect friction) :

(A) $\frac{1}{2}mv^2$
(B) mv^2
(C) $\frac{4}{3}mv^2$
(D) $\frac{4}{5}mv^2$

Answer: (C) $\frac{4}{3}mv^2$ · The council's preliminary key

Q282 AP EAMCET 2010 · 30 May · Offline MCQ

A body of mass $m_1 = 4$ kg moves at $5\hat{i}$ m/s and another body of mass $m_2 = 2$ kg moves at $10\hat{i}$ m/s. The kinetic energy of centre of mass is :

(A) $\frac{200}{3}$ J
(B) $\frac{500}{3}$ J
(C) $\frac{400}{3}$ J
(D) $\frac{800}{3}$ J

Answer: (C) $\frac{400}{3}$ J · Official APSCHE final key

Q283 AP EAMCET 2010 · 30 May · Offline MCQ

The moment of Inertia of a disc, of mass M and radius R, about an axis which is a tangent and parallel to its diameter is :

(A) $\frac{1}{2}MR^2$
(B) $\frac{3}{4}MR^2$
(C) $\frac{1}{4}MR^2$
(D) $\frac{5}{4}MR^2$

Answer: (D) $\frac{5}{4}MR^2$ · Official APSCHE final key

Q284 AP EAMCET 2010 · 30 May · Offline MCQ

A fly-wheel of mass 25 kg has a radius of 0.2 m. It is making 240 rpm. What is the torque necessary to bring to rest in 20 sec ?

(A) 2π Nm
(B) 0.2π Nm
(C) $\frac{2}{\pi}$ Nm
(D) 4π Nm

Answer: (B) 0.2π Nm · Official APSCHE final key

EdLoop EAPCET