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## EdLoop EAPCET

PHYSICS · EAPCET (EAMCET)

# Laws of Motion

## Previous Year Questions with answers

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

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**What is in this PDF:** every Laws of 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.

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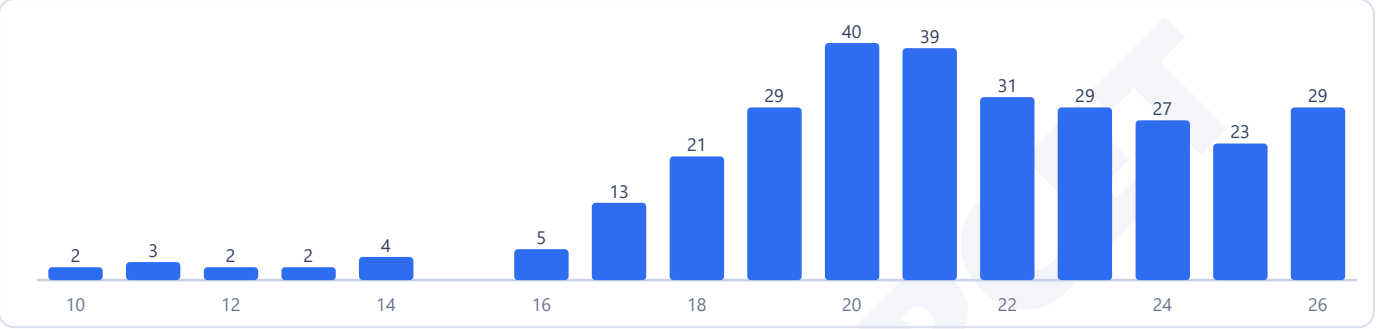
# Chapter at a glance

| 4.5% | 299 | 76 of 77 | 299 / 0 |
|---|---|---|---|
| of Physics questions, 2022–2026 | questions, 2010–2026 | papers asked it, 2022–2026 | MCQ / numerical, 2010–2026 |

**Trend.** Steady: 1.7 questions per paper in 2024–2026 against 1.9 in 2022–2023.

### Questions per year




Counts are the questions we hold: 299 in 143 papers. 4 questions in this chapter came back in more than one paper.

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

| | |
|---|---|
| Newton's Laws & Free Body Diagrams | 109 |
| Friction | 87 |
| Dynamics of Circular Motion | 53 |
| Momentum & Impulse | 50 |

## How often it comes up

Laws of Motion forms the core dynamical engine of Class 11 Physics, appearing regularly across all exam shifts. In the papers we hold from 2022 to 2026, it contributed **139 questions in 77 papers**, yielding an average of **1.8 questions per paper**. The chapter was represented in 76 of those 77 papers, missing only a single paper throughout that entire five-year span. By total question count, it stands as the **6th largest of 28 Physics chapters**, making up 4.5% of all Physics questions in this recent testing cycle.

Taking in the full timeline from 2010 to 2026, our collection records 299 questions across 143 of the 149 papers, averaging 2.0 questions per paper with a 5.0% share of the subject. In the early period from 2010 to 2021, the chapter had a higher share of 5.6% (160 questions in 72 papers, appearing in 67 papers, 2.2 per paper). Over the last three exam years from 2024 to 2026, it accounted for 79 questions in 46 papers (appearing in 46 papers, 1.7 per paper, 4.3% share). Compared to the early years, the chapter's share of Physics has fallen, whereas compared to the recent five-year baseline it has stayed about the same. Every year since 2022 has included multiple questions from this unit.

Between 2022 and 2026, the two states showed differing coverage: AP EAPCET papers carried 103 questions across 48 papers (appearing in 48 papers, 2.1 per paper, 5.4% share), whereas TS EAPCET papers held 36 questions across 29 papers (appearing in 28 papers, 1.2 per paper, 3.1% share).

## Most-asked topics

In the papers we hold from 2022 to 2026, questions divided across four primary topics:

- **Newton's Laws & Free Body Diagrams**: 52 questions. Across the entire 2010 to 2026 dataset, this topic leads with 109 questions.

- **Friction**: 43 questions recently, with 87 questions across the full archive.
- **Dynamics of Circular Motion**: 23 questions in the recent window, totalling 53 questions overall.
- **Momentum & Impulse**: 21 questions recently, and 50 questions across all years in our collection.

All four topic areas appeared in 2026 exam papers, emphasizing that candidates need well-rounded mastery of force balances, friction thresholds, and circular constraints.

## What the questions look like

Problems on Newton's laws and free body diagrams generally present connected-body systems. Familiar configurations include two or three blocks connected by light cords over pulleys, masses sliding on wedges, and bodies positioned inside accelerating elevators or vehicles. Questions typically ask for the common acceleration of the assembly, contact normal forces between adjacent blocks, or the tension developed in connecting strings.

Friction problems center on static, limiting, and kinetic frictional regimes. A classic problem involves pulling a block on a horizontal rough surface with a force directed at an angle above or below the horizontal, requiring students to adjust the normal reaction accordingly. Another standard scenario places a mass on an inclined plane whose upper half is smooth while the lower half is rough, asking for the coefficient of friction if the body comes to rest at the base. Two-block friction systems, where one block rests atop another, frequently test which mass slips first.

Circular dynamics questions investigate banked tracks, conical pendulums, and vehicles turning along curved paths with or without friction. Impulse questions usually test the area beneath force-time graphs or calculate impulse from sudden momentum changes during wall rebounds and rocket expulsions.

## How to practise it

Begin by drawing isolated free-body diagrams for every component in a multi-body arrangement. Resolve all applied forces into orthogonal axes along and perpendicular to the direction of acceleration before setting up equations of motion.

For friction problems, always evaluate the maximum available static friction force first before assuming motion occurs. Check whether the net driving force exceeds this threshold; if it does not, the static friction force simply balances the applied force and the acceleration remains zero.

In circular dynamics, clearly distinguish between centripetal force and centrifugal effects. Identify the real physical forces providing centripetal acceleration, such as the horizontal component of normal force on a banked turn or the tension component in a conical pendulum. Working through timed sets of past paper questions will build speed in resolving forces accurately.

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**Q1** AP EAPCET 2026 · 18 May · Shift 1 MCQ

A solid sphere of mass 2 kg is at rest inside a cube as shown in the figure. Now the cube moves with a velocity, $\vec{v} = (5t\hat{i} + 2t\hat{j})\ ms^{-1}$. Here $t$ is time in seconds. If the sphere is at rest with respect to cube, the force exerted by the sphere on the cube is
(All surfaces are smooth and take g = $10ms^{-2}$)

*(see the figure above)*

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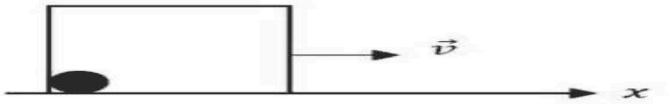
ద్రవ్యరాశి 2 kg గల గోళము పటములో చూపినట్లు ఒక ఘనములో నిశ్చల స్థితిలో ఉన్నది. ఇప్పుడు ఘనము $\vec{v} = (5t\hat{i} + 2t\hat{j})\ ms^{-1}$ వేగముతో చలించుచున్నది. ($t$- కాలము సెకండ్లలో). గోళము, ఘనం పరంగా నిశ్చల స్థితిలోనే ఉన్నచో, ఆ ఘనముపై గోళము అనువర్తించు బలము (అన్ని తలాలు ఘర్షణ రహితము, g = $10ms^{-2}$ గా తీసుకోనుము)




Options :

1. $\sqrt{29}$ N
2. 29 N
3. 26 N
4. $\sqrt{89}$ N

(A) $\sqrt{29}$ N
(B) 29 N
(C) 26 N
(D) $\sqrt{89}$ N

**Answer: (C)** 26 N · The council's preliminary key

**Q2** AP EAPCET 2026 · 18 May · Shift 1 MCQ

The blades of a wind mill sweep out a circle of area A = 2 $m^2$. The wind is flowing at velocity V = 6 $ms^{-1}$ perpendiculars to circle and the density of air is 1.2 $kg.m^{-3}$. Then the power of the mill is

(A) 160.8 W
(B) 259.2 W
(C) 302.5 W
(D) 239.2 W

**Answer: (B)** 259.2 W · The council's preliminary key

**Q3** AP EAPCET 2026 · 18 May · Shift 2 MCQ

A block of mass 5 kg is sliding with constant velocity of $6\ \mathrm{ms}^{-1}$ on a frictionless horizontal surface. The force exerted on the horizontal surface is

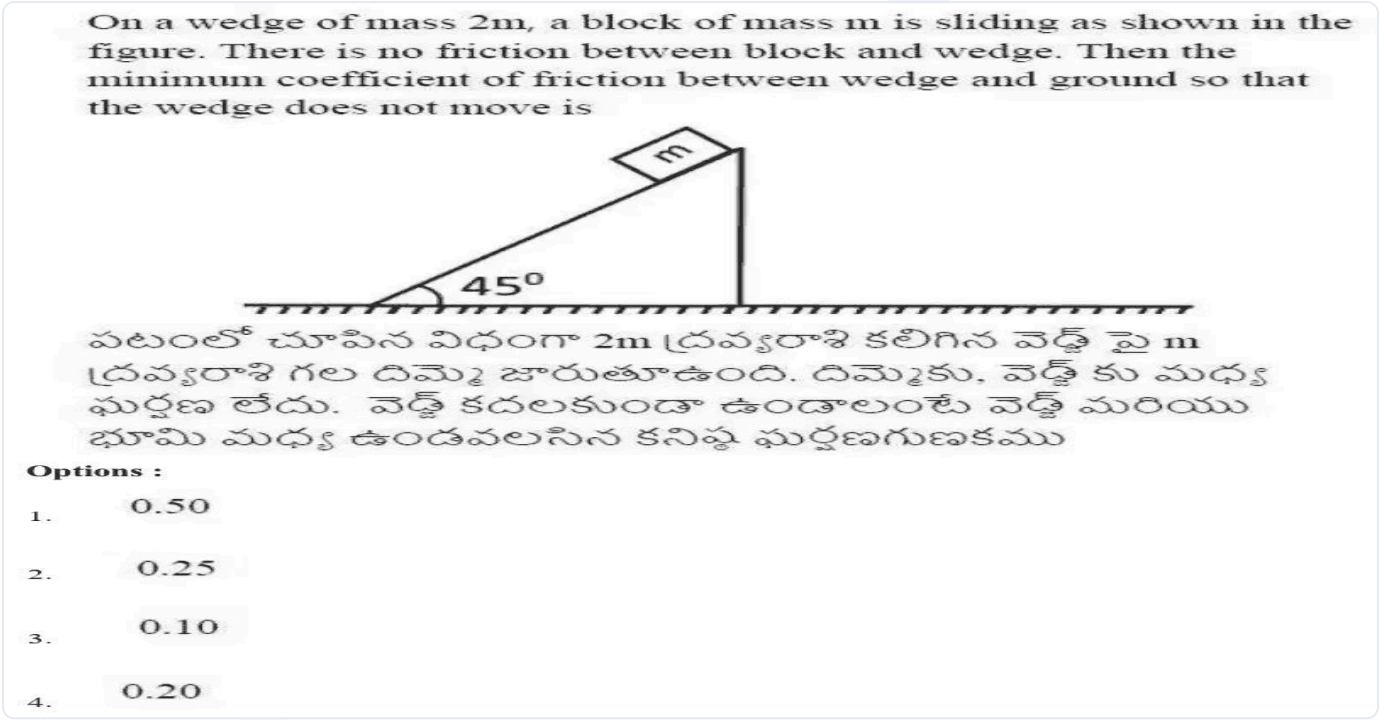
(A) 30 N
(B) 1.2 N
(C) 150 N
(D) 49 N

**Answer: (D)** 49 N · The council's preliminary key

**Q4** AP EAPCET 2026 · 18 May · Shift 2 MCQ

On a wedge of mass 2m, a block of mass m is sliding as shown in the figure. There is no friction between block and wedge. Then the minimum coefficient of friction between wedge and ground so that the wedge does not move is

*(see the figure above)*




(A) 0.50
(B) 0.25
(C) 0.10
(D) 0.20

**Answer: (D)** 0.20 · The council's preliminary key

**Q5** AP EAPCET 2026 · 15 May · Shift 1 MCQ

A body of mass 1 kg is attached to one end of a string of 1 m length. It is rotated in a vertical circle with a constant speed of $4\ \mathrm{ms}^{-1}$. When the object is at the highest point of the vertical circle, tension

in the string is ($g = 10\ \mathrm{ms}^{-2}$)

(A) 6 N
(B) 8 N
(C) 10 N
(D) 16 N

**Answer: (A)** 6 N · The council's preliminary key

**Q6** AP EAPCET 2026 · 15 May · Shift 2 MCQ

A particle moves in horizontal circle. If the speed is doubled, centripetal force becomes

(A) Same
(B) Double
(C) Four times
(D) Half

**Answer: (C)** Four times · The council's preliminary key

**Q7** AP EAPCET 2026 · 15 May · Shift 2 MCQ

A $5\,kg$ block on horizontal surface is pulled by $15\,N$. If the coefficient of friction between the block and surface is 0.2, then the acceleration of the block is ___ $[g = 10\,ms^{-2}]$

(A) 0
(B) $1\,ms^{-2}$
(C) $2\,ms^{-2}$
(D) $3\,ms^{-2}$

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

**Q8** AP EAPCET 2026 · 15 May · Shift 2 MCQ

A body which is initially at rest breaks into 2 pieces of masses 4M and 6M respectively, together having a total kinetic energy E. The piece with mass 4M, after breaking has a kinetic energy

(A) 0.6 E
(B) 0.4 E
(C) 0.2 E
(D) 0.8 E

**Answer: (A)** 0.6 E · The council's preliminary key

**Q9** AP EAPCET 2026 · 14 May · Shift 1 MCQ

A small bead is placed on a thin circular loop of radius 25 cm which is rotating about its vertical diameter with a constant velocity of 10 rad $s^{-1}$. The angle made by the radius vector joining the

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center of the loop to the bead makes with the vertically downward direction is
(Neglect friction and take acceleration due to gravity = 10 $ms^{-2}$)

(A) $\cos^{-1}(0.4)$
(B) $\cos^{-1}(0.6)$
(C) $\sin^{-1}(0.4)$
(D) $\sin^{-1}(0.6)$

**Answer: (A)** $\cos^{-1}(0.4)$ · The council's preliminary key

**Q10** AP EAPCET 2026 · 14 May · Shift 1 MCQ

A body is placed at the top of an inclined plane of angle of inclination $\tan^{-1}\left(\frac{9}{16}\right)$. If the plane is smooth, the body takes a time of T to reach the bottom of the plane and if the plane is rough, it takes a time of 3T to reach the bottom of the plane, then the coefficient of kinetic friction between the body and the rough inclined plane is

(A) 0.2
(B) 0.3
(C) 0.4
(D) 0.5

**Answer: (D)** 0.5 · The council's preliminary key

**Q11** AP EAPCET 2026 · 14 May · Shift 1 MCQ

On imparting an initial velocity $v_0$ a ball begins to move in horizontal circle of radius $R$ on horizontal plane. If the coefficient of friction between the ball and plane is $\mu$. Then the time required by ball to come to rest

*(see the figure above)*

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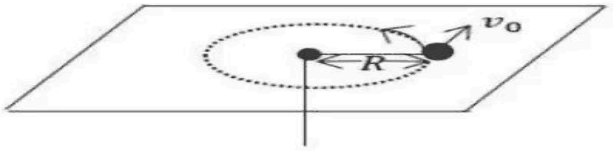



ఒక బంతికి తొలి వేగం $v_0$ ఇవ్వబడినప్పుడు, అది సమతల ఉపరితలంపై వ్యాసార్ధం $R$ గల సమతల వృత్తంలో కదలడం ప్రారంభిస్తుంది. బంతి మరియు ఉపరితలం మధ్య ఘర్షణ గుణకం $\mu$ అయినపుడు, బంతి పూర్తిగా ఆగుటకు పట్టు కాలం

**Options :**

1. $v_0^2(\mu/g)$
2. $(\mu g)/v_0$
3. $v_0(\mu/g)$
4. $v_0/(\mu g)$

(A) $v_0^2(\mu/g)$
(B) $(\mu g)/v_0$
(C) $v_0(\mu/g)$
(D) $v_0/(\mu g)$

**Answer: (D)** $v_0/(\mu g)$ · The council's preliminary key

## Q12 AP EAPCET 2026 · 14 May · Shift 2 MCQ

A stream of water flowing horizontally with a speed of $15\ \mathrm{m\ s^{-1}}$ gushes out of a tube of cross-sectional area $10^{-2}\ \mathrm{m^2}$ and hits a vertical wall nearby. Assuming water does not rebound, The force exerted on the wall by the impact of water is

(A) $2.25\ \mathrm{N}$
(B) $2.25 \times 10^3\ \mathrm{N}$
(C) $1.5\ \mathrm{N}$
(D) $1.5 \times 10^3\ \mathrm{N}$

**Answer: (B)** $2.25 \times 10^3\ \mathrm{N}$ · The council's preliminary key

## Q13 AP EAPCET 2026 · 14 May · Shift 2 MCQ

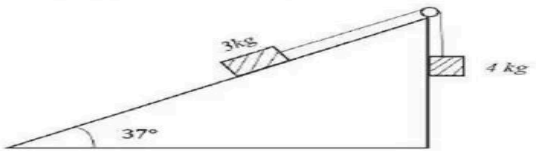
$3\ kg$ block on rough incline $37^\circ$ is connected to a hanging mass of $4\ kg$. If the coefficient of friction between the $3\ kg$ block and the rough incline $\mu = 0.25$, then acceleration of the system is

$$\begin{bmatrix} g = 10\ ms^{-2} \\ \sin 37^\circ = 0.6 \\ \cos 37^\circ = 0.8 \end{bmatrix}$$

*(see the figure above)*

$3\ kg$ block on rough incline $37°$ is connected to a hanging mass of $4\ kg$. If the coefficient of friction between the $3\ kg$ block and the rough incline $\mu = 0.25$, then acceleration of the system is

$$\begin{bmatrix} g = 10\ ms^{-2} \\ \sin 37° = 0.6 \\ \cos 37° = 0.8 \end{bmatrix}$$




$37°$ గరుకు వాలుతలంపై ఉన్న $3\ kg$ దిమ్మెకు, $4\ kg$ దిమ్మెను కలిపి క్రిందకు ప్రేలాడదీసారు. $3\ kg$ దిమ్మెకు గరుకు వాలు తలానికి మధ్య ఘర్షణ గుణకం $\mu = 0.25$ అయిన, దిమ్మెల వ్యవస్థ త్వరణం

$$\begin{bmatrix} g = 10\ ms^{-2} \\ \sin 37° = 0.6 \\ \cos 37° = 0.8 \end{bmatrix}$$

**Options :**

1. $2.28\ \mathrm{m\ s^{-2}}$
2. $1.08\ \mathrm{m\ s^{-2}}$
3. $3.2\ \mathrm{m\ s^{-2}}$
4. Zero
   శూన్యం

(A) $2.28\ \mathrm{m\ s^{-2}}$
(B) $1.08\ \mathrm{m\ s^{-2}}$
(C) $3.2\ \mathrm{m\ s^{-2}}$
(D) Zero

**Answer: (A)** $2.28\ \mathrm{m\ s^{-2}}$ · The council's preliminary key

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## Q14 AP EAPCET 2026 · 13 May · Shift 1 MCQ

A block is kept at the top of a rough inclined plane of length 2.8 m and angle of inclination $\cos^{-1}(0.6)$. If the coefficient of kinetic friction between the block and the upper half of the plane is 0.3 and between the block and the lower half of the plane is 0.5, then the velocity with which the block reaches the bottom of the plane is (acceleration due to gravity = $10\ \mathrm{ms^{-2}}$)

(A) $1.4\ \mathrm{ms^{-1}}$
(B) $5.6\ \mathrm{ms^{-1}}$
(C) $4.2\ \mathrm{ms^{-1}}$
(D) $2.8\ \mathrm{ms^{-1}}$

**Answer: (B)** $5.6\ \mathrm{ms^{-1}}$ · The council's preliminary key

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## Q15 AP EAPCET 2026 · 13 May · Shift 1 MCQ

A stone of mass 400 g tied to one end of a string is rotated in a horizontal circle of radius 125 m. If the string can withstand a maximum tension of $50\pi^2$ N, then the minimum time period with which the stone can be rotated is

(A) 3 s
(B) 2 s
(C) 4 s
(D) 6 s

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

**Q16** AP EAPCET 2026 · 13 May · Shift 2 MCQ

A bullet fired from a gun is given a force $(600 - 2 \times 10^5 t)$ newton, where '$t$' is in second. Force on the bullet becomes zero when it leaves the barrel. The average impulse imparted to the bullet is

(A) $9\ Ns$
(B) zero
(C) $0.9\ Ns$
(D) $1.8\ Ns$

**Answer: (C)** $0.9\ Ns$ · The council's preliminary key

**Q17** AP EAPCET 2026 · 13 May · Shift 2 MCQ

A block of mass '$m$' is placed on a smooth wedge of inclination '$\theta$'. This system is accelerated horizontally so that the block does not slip on the wedge. Then, the force exerted by the wedge on the block will be
($g$ – acceleration due to gravity)

(A) $mg\cos\theta$
(B) $mg\sin\theta$
(C) $mg$
(D) $\dfrac{mg}{\cos\theta}$

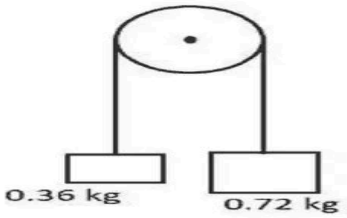
**Answer: (D)** $\dfrac{mg}{\cos\theta}$ · The council's preliminary key

**Q18** AP EAPCET 2026 · 13 May · Shift 2 MCQ

A light inextensible string connects two masses over a fixed smooth pully as shown in the figure. The workdone by the string on mass 0.36 kg during first second after the masses are released (Take $g = 10\,\mathrm{ms}^{-2}$)

*(see the figure above)*

A light inextensible string connects two masses over a fixed smooth pully as shown in the figure. The workdone by the string on mass 0.36 kg during first second after the masses are released (Take g = 10ms$^{-2}$)




రెండు ద్రవ్యరాశులను ఒక తేలికైన, సాగదీయుటకు వీలులేని తంత్రి తో పటములో చూపినట్లు ఘర్షణ రహిత గిలక ద్వారా వ్రేలాడదీశారు. ద్రవ్యరాశులను వదిలి మొదటి సెకండు కాలములో 0.36 kg ద్రవ్యరాశి పై తంత్రి చేసే పని (g = 10 ms$^{-2}$ గా తీసుకొనుము)

**Options :**

1. 6 J
2. 5 J
3. 8 J
4. 2 J

(A) 6 J
(B) 5 J
(C) 8 J
(D) 2 J

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

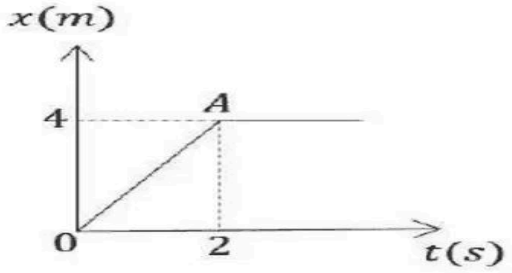
## Q19 AP EAPCET 2026 · 12 May · Shift 1 MCQ

The figure shows the position-time graph of a particle of mass $2\ kg$. The impulse of the particle at $t = 0\ s$ is

*(see the figure above)*

The figure shows the position-time graph of a particle of mass 2 $kg$. The impulse of the particle at $t = 0\ s$ is

2 $kg$ ద్రవ్యరాశి గల కణం స్థానం–కాలం గ్రాఫు పటంలో చూపబడింది. $t = 0\ s$ వద్ద కణంపై పనిచేయు ప్రచోదనం




**Options :**

1. $2\ kgms^{-1}$
2. $4\ kgms^{-1}$
3. $1\ kgms^{-1}$
4. $3\ kgms^{-1}$

(A) $2\ kgms^{-1}$
(B) $4\ kgms^{-1}$
(C) $1\ kgms^{-1}$
(D) $3\ kgms^{-1}$

**Answer: (B)** $4\ kgms^{-1}$ · The council's preliminary key

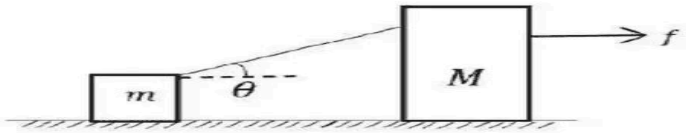
## Q20 AP EAPCET 2026 · 12 May · Shift 1 MCQ

Two blocks of masses $m$ and $M$ are connected by an inextensible light string. A constant horizontal force $f$ acts on the block of mass $M$, then tension in the string is (Neglect friction)

*(see the figure above)*

Correct Marks : 1 Wrong Marks : 0

Two blocks of masses $m$ and $M$ are connected by an inextensible light string. A constant horizontal force $f$ acts on the block of mass $M$, then tension in the string is (Neglect friction)




$m$ మరియు $M$ ద్రవ్యరాశులు గల రెండు దిమ్మెలు ఒక సాగదీయుటకు వీలులేని తేలికపాటి తంత్రితో అనుసంధానించబడ్డాయి. $M$ ద్రవ్యరాశి గల దిమ్మెపై క్షితిజసమాంతర బలం $f$ ప్రయోగిస్తే, తంత్రిలో తన్యత (ఘర్షణ విస్మరించండి)

Options :

1. $\frac{mf}{(M+m)cos\theta}$
2. $\frac{Mf}{mcos\theta}$
3. $\frac{Mf}{(M+m)cos\theta}$
4. $\frac{mf}{Mcos\theta}$

(A) $\frac{mf}{(M+m)\cos\theta}$

(B) $\frac{Mf}{m\cos\theta}$

(C) $\frac{Mf}{(M+m)\cos\theta}$

(D) $\frac{mf}{M\cos\theta}$

**Answer: (A)** $\frac{mf}{(M+m)\cos\theta}$ · The council's preliminary key

## Q21 AP EAPCET 2026 · 12 May · Shift 2 MCQ

A block of mass 2kg placed on a rough horizontal surface is pulled with a force of 30 N which makes an angle of $\sin^{-1}(0.6)$ with the horizontal. If the coefficient of kinetic friction between the block and the surface is 0.4, then the acceleration of the block is (Acceleration due to gravity = $10\ ms^{-2}$)

(A) $8.8\ ms^{-2}$

(B) $11.6\ ms^{-2}$

(C) $5.8\ ms^{-2}$

(D) $10.6\ ms^{-2}$

**Answer: (B)** $11.6\ ms^{-2}$ · The council's preliminary key

## Q22 AP EAPCET 2026 · 12 May · Shift 2 MCQ

A body of mass $5$ kg at rest is acted upon by two forces $30$ N and F. If the angle between the forces is $60^0$ and the distance travelled by the body in a time of $2$s under the action of these forces is $28$m, then F =

(A) 60N
(B) 40N
(C) 50N
(D) 30N

**Answer: (C)** 50N · The council's preliminary key

**Q23** TS EAPCET 2026 · 11 May · Shift 1 MCQ

A block of mass 2 kg is kept on a horizontal surface and is pulled with a horizontal force F. If the surface is smooth, the acceleration of the block is $8\ \mathrm{ms}^{-2}$. If the surface is rough and the coefficient of kinetic friction between the block and the surface is 0.25, then the acceleration of the block is (Acceleration due to gravity $= 10\ \mathrm{ms}^{-2}$)

(A) $5.5\ \mathrm{ms}^{-2}$
(B) $6.5\ \mathrm{ms}^{-2}$
(C) $4.5\ \mathrm{ms}^{-2}$
(D) $3.5\ \mathrm{ms}^{-2}$

**Answer: (A)** $5.5\ \mathrm{ms}^{-2}$ · The council's preliminary key

**Q24** TS EAPCET 2026 · 11 May · Shift 2 MCQ

The angle of inclination of an inclined plane is $45^\circ$. If the coefficient of kinetic friction between the inclined plane and a block on it is 0.2, then the block released from rest from the top of the inclined plane reaches the bottom of the plane in a time of 3 s. If the coefficient of kinetic friction between the block and the inclined plane is 0.8, then the time taken by the same block to reach the bottom of the plane is

(A) 6 s
(B) 9 s
(C) 7.5 s
(D) 4.5 s

**Answer: (A)** 6 s · The council's preliminary key

**Q25** TS EAPCET 2026 · 10 May · Shift 1 MCQ

A block slides down a rough inclined plane with a constant velocity $9.8\ \mathrm{ms}^{-1}$. The coefficient of kinetic friction between the block and the surface is $\frac{1}{\sqrt{3}}$. If the block is pushed up along the inclined plane from bottom of the plane with a velocity $9.8\ \mathrm{ms}^{-1}$, then the distance travelled by the block before coming to rest is

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(A) 9.80 m
(B) 2.45 m
(C) 14.75 m
(D) 4.90 m

**Answer: (D)** 4.90 m · The council's preliminary key

## Q26 TS EAPCET 2026 · 10 May · Shift 2 MCQ

When a force of 8 N is applied on a body, its velocity changes from $8\ \mathrm{ms}^{-1}$ to $16\ \mathrm{ms}^{-1}$ in a time of 4 s. The force required to change the velocity of the same body from $16\ \mathrm{ms}^{-1}$ to $20\ \mathrm{ms}^{-1}$ in a time of 2 s is

(A) 12 N
(B) 4 N
(C) 8 N
(D) 16 N

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

## Q27 TS EAPCET 2026 · 9 May · Shift 1 MCQ

A body of mass M is suspended to the lower end of an aeroplane accelerating horizontally. If the rope used to hang the body can withstand a maximum tension T, then the maximum acceleration of the aeroplane is
(g = acceleration due to gravity and neglect the mass of the rope)

(A) $\sqrt{\frac{T^2}{M^2} - g^2}$
(B) $\frac{T}{M} - g$
(C) $\frac{T}{M} + g$
(D) $\sqrt{\frac{T^2}{M^2} + g^2}$

**Answer: (A)** $\sqrt{\frac{T^2}{M^2} - g^2}$ · The council's preliminary key

## Q28 TS EAPCET 2026 · 9 May · Shift 2 MCQ

A block is at rest at the top of an inclined plane of angle of inclination $30^\circ$. The coefficient of kinetic friction between the upper half surface of the plane and the block is $\frac{1}{2\sqrt{3}}$, and the coefficient of kinetic friction between the lower half surface of the plane and the block is $\frac{1}{4\sqrt{3}}$. When the block slides down, ratio of the velocities of the block at the midpoint of the plane and at the bottom of the plane is

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

**Answer: (B)** $\sqrt{2}:\sqrt{5}$ · The council's preliminary key

**Q29** TS EAPCET 2026 · 9 May · Shift 2 MCQ

A bomb of mass 'm' at rest explodes into three parts. If these three parts move horizontally with equal speeds in different directions, then the masses of the three parts can be

(A) $\frac{3m}{11}, \frac{m}{3}, \frac{13m}{33}$
(B) $\frac{m}{6}, \frac{m}{3}, \frac{m}{2}$
(C) $\frac{4m}{19}, \frac{5m}{19}, \frac{10m}{19}$
(D) $\frac{6m}{29}, \frac{8m}{29}, \frac{15m}{29}$

**Answer: (A)** $\frac{3m}{11}, \frac{m}{3}, \frac{13m}{33}$ · The council's preliminary key

**Q30** AP EAPCET 2025 · 27 May · Shift 1 MCQ

The apparent weight of a girl of mass $30\ \text{kg}$ when she is in a lift moving vertically upwards with an acceleration of $2\ \text{m s}^{-2}$ is
(Acceleration due to gravity $= 10\ \text{m s}^{-2}$)

(A) $60\ \text{N}$
(B) $30\ \text{N}$
(C) $240\ \text{N}$
(D) $360\ \text{N}$

**Answer: (D)** $360\ \text{N}$ · The council's preliminary key

**Q31** AP EAPCET 2025 · 27 May · Shift 1 MCQ

If a stone of mass $0.5$ kg tied to one end of a wire is whirled in a circular path of radius $2$ m with a speed $40$ rev/min in a horizontal plane, then the tension in the wire is nearly

(A) $14.8\ \text{N}$
(B) $12.4\ \text{N}$
(C) $17.5\ \text{N}$
(D) $20.8\ \text{N}$

**Answer: (C)** $17.5\ \text{N}$ · The council's preliminary key

**Q32** AP EAPCET 2025 · 26 May · Shift 1 MCQ

If the breaking strength of a rope is $\frac{4}{3}$ times the weight of a person, then the maximum acceleration with which the person can safely climb up the rope is (g - accelereation due to gravity)

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

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

**Q33** AP EAPCET 2025 · 26 May · Shift 1 MCQ

A block of mass 2 kg is placed on a rough horizontal surface. If a horizontal force of 20 N acting on the block produces an acceleration of $7\ \mathrm{m\,s^{-2}}$ in it, then the coefficient of kinetic friction between the block and the suface is (Aceleration due to gravity = $10\ \mathrm{m\,s^{-2}}$)

(A) 0.2
(B) 0.3
(C) 0.4
(D) 0.5

**Answer: (B)** 0.3 · The council's preliminary key

**Q34** AP EAPCET 2025 · 26 May · Shift 1 MCQ

Two smooth inclined planes A and B each of height 20 m have angles of inclination $30^\circ$ and $60^\circ$ respectively. If $t_1$ and $t_2$ are respectively the times taken by two blocks to reach the bottom of the planes A and B from the top, then $t_1 - t_2 =$ (Acceleration due to gravity $= 10\ \mathrm{m\,s^{-2}}$)

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

**Answer: (C)** $4\left(\frac{\sqrt{3}-1}{\sqrt{3}}\right)\ \mathrm{s}$ · The council's preliminary key

**Q35** AP EAPCET 2025 · 26 May · Shift 2 MCQ

If a body of mass $2\ \mathrm{kg}$ moving with initial velocity of $4\ \mathrm{m\,s^{-1}}$ is subjected to a force of $3\ \mathrm{N}$ for a time of $2\ \mathrm{s}$ normal to the direction of its initial velocity, then the resultant velocity of the body is

(A) $7\ \mathrm{m\,s^{-1}}$
(B) $5\ \mathrm{m\,s^{-1}}$
(C) $2\ \mathrm{m\,s^{-1}}$
(D) $7.5\ \mathrm{m\,s^{-1}}$

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

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**Q36** AP EAPCET 2025 · 24 May · Shift 1 MCQ

A disc of mass 0.2 kg is kept floating in air without falling by vertically firing bullets each of mass 0.05 kg on the disc at the rate of 10 bullets per every second. If the bullets rebound with the same speed, then the speed of each bullet is (Acceleration due to gravity = $10\ \mathrm{ms}^{-2}$)

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

**Answer: (A)** $2\ \mathrm{m\ s}^{-1}$ · The council's preliminary key

**Q37** AP EAPCET 2025 · 23 May · Shift 1 MCQ

A wire of length $2.5$ m is fixed at one end and a box of mass $4$ kg is tied at the other end. If the wire rotates in a horizontal circle about the fixed end with $\frac{2}{\pi}$ rotations per second, then the tension in the wire is

(A) $16$ N
(B) $32$ N
(C) $64$ N
(D) $160$ N

**Answer: (D)** $160$ N · The council's preliminary key

**Q38** AP EAPCET 2025 · 23 May · Shift 1 MCQ

If the tension in the horizontal wire shown in the figure is 30 N, then the weight W and tension in the wire OA are respectively

*(see the figure above)*

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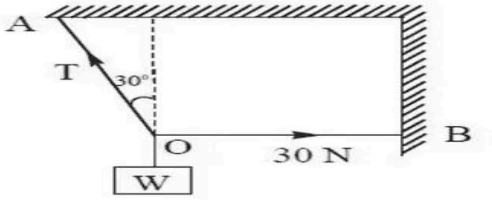
If the tension in the horizontal wire shown in the figure is 30 N, then the weight W and tension in the wire OA are respectively
పటంలో చూపిన క్షితిజ సమాంతర తీగలోని తన్యత 30 N, అయిన భారం W మరియు OA తీగలోని తన్యత వరుసగా




Options :

1. $30\sqrt{3}$ N, 30 N
2. $30\sqrt{3}$ N, 60 N
3. $60\sqrt{3}$ N, 30 N
4. $60\sqrt{3}$ N, 60 N

(A) $30\sqrt{3}\ \text{N}, 30\ \text{N}$
(B) $30\sqrt{3}\ \text{N}, 60\ \text{N}$
(C) $60\sqrt{3}\ \text{N}, 30\ \text{N}$
(D) $60\sqrt{3}\ \text{N}, 60\ \text{N}$

**Answer: (B)** $30\sqrt{3}\ \text{N}, 60\ \text{N}$ · The council's preliminary key

## Q39 AP EAPCET 2025 · 23 May · Shift 2 MCQ

Water flowing through a pipe of area of cross-section $2 \times 10^{-3}\ \text{m}^2$ hits a vertical wall horizontally with a velocity of $12\ \text{m s}^{-1}$. If the water does not rebound after hitting the wall, then the force acting on the wall due to water is

(A) 24 N
(B) 144 N
(C) 288 N
(D) 72 N

**Answer: (C)** 288 N · The council's preliminary key

## Q40 AP EAPCET 2025 · 23 May · Shift 2 MCQ

Two blocks A and B of masses $2$ kg and $4$ kg respectively are kept on a rough horizontal surface. If same force of $20$ N is applied on each block, then the ratio of the accelerations of the blocks A and B is
(Coefficient of kinetic friction between the surface and the blocks is $0.3$ and acceleration due to gravity $= 10\ \text{m s}^{-2}$)

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

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

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**Q41** AP EAPCET 2025 · 22 May · Shift 1 MCQ

Two balls each of mass 250 g moving in opposite directions each with a speed $16\ \mathrm{m\,s^{-1}}$ collide and rebound with the same speeds. The impulse imparted to one ball due to the other is

(A) $4\ \mathrm{kg\,m\,s^{-1}}$
(B) $16\ \mathrm{kg\,m\,s^{-1}}$
(C) $8\ \mathrm{kg\,m\,s^{-1}}$
(D) $2\ \mathrm{kg\,m\,s^{-1}}$

**Answer: (C)** $8\ \mathrm{kg\,m\,s^{-1}}$ · The council's preliminary key

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**Q42** AP EAPCET 2025 · 22 May · Shift 2 MCQ

A balloon with mass 'm' is descending vertically with an acceleration 'a' (where $a < g$). The mass to be removed from the balloon, so that it starts moving vertically up with an acceleration 'a' is

(A) $\dfrac{ma}{g+a}$
(B) $\dfrac{ma}{g-a}$
(C) $\dfrac{2ma}{g+a}$
(D) $\dfrac{2ma}{g-a}$

**Answer: (C)** $\dfrac{2ma}{g+a}$ · The council's preliminary key

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**Q43** AP EAPCET 2025 · 22 May · Shift 2 MCQ

A conveyor belt is moving horizontally with a velocity of $2\ \mathrm{m\,s^{-1}}$. If a body of mass $10\ \mathrm{kg}$ is kept on it, then the distance travelled by the body before coming to rest is

(The coefficient of kinetic friction between the belt and the body is $0.2$ and acceleration due to gravity is $10\ \mathrm{m\,s^{-2}}$)

(A) $4\ \mathrm{m}$
(B) $0\ \mathrm{m}$
(C) $1\ \mathrm{m}$
(D) $2\ \mathrm{m}$

**Answer: (C)** $1\ \mathrm{m}$ · The council's preliminary key

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## Q44 AP EAPCET 2025 · 21 May · Shift 1 MCQ

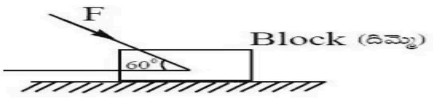
As shown in the figure, a force F is applied on a block of mass $\sqrt{3}$ kg placed on a rough horizontal surface. The maximum value of F for the block not to move is

(Coefficient of static friction between the block and the surface is $\frac{1}{2\sqrt{3}}$ and acceleration due to gravity = 10 m $s^{-2}$)

*(see the figure above)*

As shown in the figure, a force F is applied on a block of mass $\sqrt{3}$ kg placed on a rough horizontal surface. The maximum value of F for the block not to move is

(Coefficient of static friction between the block and the surface is $\frac{1}{2\sqrt{3}}$ and acceleration due to gravity = 10 m $s^{-2}$)




పటంలో చూపిన విధంగా, ఒక క్షితిజ సమాంతర గరుకు తలంపై ఉంచబడిన $\sqrt{3}$ kg ద్రవ్యరాశి కలిగిన ఒక దిమ్మెపై బలం F పని చేయుచున్నది. దిమ్మె కదలకుండా ఉండవలెనన్న, F యొక్క గరిష్ఠ విలువ

(దిమ్మెకు, తలానికి మధ్య స్థైతిక ఘర్షణ గుణకం $\frac{1}{2\sqrt{3}}$ మరియు గురుత్వ త్వరణం =10 m $s^{-2}$)

Options :

1. 5 N
2. 10 N
3. 15 N
4. 20 N

(A) 5 N
(B) 10 N
(C) 15 N
(D) 20 N

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

## Q45 AP EAPCET 2025 · 21 May · Shift 2 MCQ

A body of mass $5\,\text{kg}$ starts from the origin with an initial velocity $\left(30\hat{i}+40\hat{j}\right)\,\text{ms}^{-1}$. If a constant force $-(\hat{i}+5\hat{j})\,\text{N}$ acts on the body, then the time in which the y-component of its velocity becomes zero is

(A) 5 s
(B) 20 s
(C) 40 s
(D) 80 s

**Answer: (C)** 40 s · The council's preliminary key

**Q46** AP EAPCET 2025 · 21 May · Shift 2 MCQ

A block of mass 10 kg moving with a speed of $5\hat{i}\ \mathrm{m\,s^{-1}}$ on a frictionless horizontal surface suddenly explodes into two pieces. If one piece with mass 4 kg moves with a speed of $10\hat{i}\ \mathrm{m\,s^{-1}}$, then the velocity of the second piece is

(A) $7.67\ \mathrm{m\,s^{-1}}$
(B) $1.67\ \mathrm{m\,s^{-1}}$
(C) $6.67\mathrm{s}\ \mathrm{m\,s^{-1}}$
(D) $2.67\ \mathrm{m\,s^{-1}}$

**Answer: (B)** $1.67\ \mathrm{m\,s^{-1}}$ · The council's preliminary key

**Q47** TS EAPCET 2025 · 4 May · Shift 1 MCQ

A circular path of radius 75 m is banked at an angle of $\tan^{-1}(0.2)$. If the coefficient of static friction between the tyres of the car and the circular path is 0.1, then the maximum permissible speed of the car to avoid slipping is

(A) $10\ \mathrm{ms^{-1}}$
(B) $20\ \mathrm{ms^{-1}}$
(C) $15\ \mathrm{ms^{-1}}$
(D) $30\ \mathrm{ms^{-1}}$

**Answer: (C)** $15\ \mathrm{ms^{-1}}$ · The council's preliminary key

**Q48** TS EAPCET 2025 · 4 May · Shift 2 MCQ

A block of mass $\sqrt{2}$ kg is placed on a rough horizontal surface. A force 'F' acting upwards at an angle of $45^\circ$ with the horizontal causes the block to start motion. If the coefficient of static friction between the surface and the block is 0.25, the magnitude of the force 'F' is

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

(A) 0.5 N
(B) 2 N
(C) 4 N
(D) 8 N

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

**Q49** TS EAPCET 2025 · 3 May · Shift 1 MCQ

A force separately produces accelerations of $18\ \mathrm{ms^{-2}}$, $9\ \mathrm{ms^{-2}}$ and $6\ \mathrm{ms^{-2}}$ in three bodies of masses P, Q and R respectively. If the same force is applied on a body of mass $P+Q+R$, then the acceleration of that body is

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(A) $3\,\mathrm{ms}^{-2}$
(B) $6\,\mathrm{ms}^{-2}$
(C) $2\,\mathrm{ms}^{-2}$
(D) $33\,\mathrm{ms}^{-2}$

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

**Q50** TS EAPCET 2025 · 3 May · Shift 2 MCQ

A truck of mass 8 ton is carrying a block of mass 2 ton. If a breaking force of 25 kN is applied on the truck, then the frictional force acting on the block is

(Coefficient of static friction between the block and the truck is 0.3)

(A) 6250 N
(B) 6000 N
(C) 5000 N
(D) 1000 N

**Answer: (C)** 5000 N · The council's preliminary key

**Q51** TS EAPCET 2025 · 2 May · Shift 1 MCQ

A man of mass 60 kg is standing in a lift moving up with a retardation of $2.8\,\mathrm{ms}^{-2}$. The apparent weight of the man is

(A) 756 N
(B) 168 N
(C) 588 N
(D) 420 N

**Answer: (D)** 420 N · The council's preliminary key

**Q52** TS EAPCET 2025 · 2 May · Shift 2 MCQ

If the system of blocks shown in the figure is released from rest, the ratio of the tensions $T_1$ and $T_2$ is

(Neglect the mass of the string shown in the figure)

*(see the figure above)*

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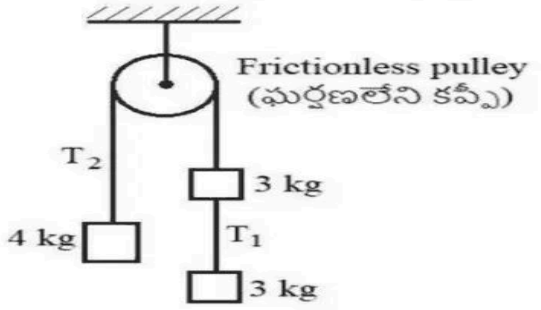
If the system of blocks shown in the figure is released from rest, the ratio of the tensions $T_1$ and $T_2$ is
(Neglect the mass of the string shown in the figure)
పటంలో చూపిన దిమ్మెల వ్యవస్థను విరామస్థితి నుండి జార విడిచిన, $T_1$ మరియు $T_2$ తన్యతల నిష్పత్తి
(పటంలో చూపబడిన దారం ద్రవ్యరాశిని విస్మరింపుము)




Options :
1. $1:1$
2. $1:2$
3. $1:3$
4. $3:4$

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

**Answer: (B)** $1:2$ · The council's preliminary key

## Q53 AP EAPCET 2024 · 23 May · Shift 1 MCQ

A balloon carrying some sand of mass M is moving down with a constant acceleration $a_0$. The mass 'm' of sand to be removed so that the balloon moves up with double the acceleration $a_0$ is

(A) $m = \dfrac{2Ma_0}{a_0 + g}$
(B) $m = \dfrac{2Ma_0}{a_0 - g}$
(C) $m = \dfrac{3Ma_0}{g + 2a_0}$
(D) $m = \dfrac{3Ma_0}{g - 2a_0}$

**Answer: (C)** $m = \dfrac{3Ma_0}{g + 2a_0}$ · The council's preliminary key

## Q54 AP EAPCET 2024 · 23 May · Shift 1 MCQ

A soccer ball of mass 250 g is moving horizontally to the left with a speed $22\ \text{ms}^{-1}$. This ball is kicked towards right with a velocity $30\ \text{ms}^{-1}$ at an angle $53^\circ$ with the horizontal in upward direction. Assuming that it took 0.01 s for the collision to take place, the average force acting is $\left(\cos 53^\circ = \frac{3}{5};\ \sin 53^\circ = \frac{4}{5}\right)$

(A) 1000 N
(B) 986 N
(C) 1166 N
(D) 2000 N

**Answer: (C)** 1166 N · The council's preliminary key

**Q55** AP EAPCET 2024 · 22 May · Shift 1 MCQ

A block of mass 5 kg is placed on a rough horizontal surface having coefficient of friction 0.5. If a horizontal force of 60 N is acting on it, then the acceleration of the block is (Acceleration due to gravity, $g = 10\ \text{ms}^{-2}$)

(A) $7\ \text{ms}^{-2}$
(B) $5\ \text{ms}^{-2}$
(C) $10\ \text{ms}^{-2}$
(D) $15\ \text{ms}^{-2}$

**Answer: (A)** $7\ \text{ms}^{-2}$ · The council's preliminary key

**Q56** AP EAPCET 2024 · 22 May · Shift 2 MCQ

The acceleration of a body sliding down the inclined plane, having coefficient of friction '$\mu$', is

(A) $a = g(\sin\theta + \mu\cos\theta)$
(B) $a = g(\sin\theta - \mu\cos\theta)$
(C) $a = g(\cos\theta - \mu\sin\theta)$
(D) $a = g(\cos\theta + \mu\sin\theta)$

**Answer: (B)** $a = g(\sin\theta - \mu\cos\theta)$ · The council's preliminary key

**Q57** AP EAPCET 2024 · 22 May · Shift 2 MCQ

A body of 2 kg mass slides down with an acceleration of $4\ \text{ms}^{-2}$ on an inclined plane having slope of $30^\circ$. The external force required to take the same body up the plane with same acceleration will be (Acceleration due to gravity $= 10\ \text{ms}^{-2}$)

(A) 8 N
(B) 16 N
(C) 22 N
(D) 20 N

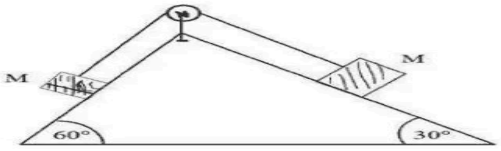
**Answer: (D)** 20 N · The council's preliminary key

**Q58** AP EAPCET 2024 · 22 May · Shift 2 MCQ

Two blocks of equal masses are tied with a light string passing over a massless pulley (Assuming frictionless surfaces) acceleration of centre of mass of the two blocks is (g = 10 $\text{ms}^{-2}$)

*(see the figure above)*

Two blocks of equal masses are tied with a light string passing over a massless pulley (Assuming frictionless surfaces) acceleration of centre of mass of the two blocks is ($g = 10\ ms^{-2}$)
రెండు సమాన ద్రవ్యరాశులు గల దిమ్మలు తేలికపాటి దారంతో భారరహిత కప్పీ మీదుగా పటంలో చూపబడినట్లు కలపబడినది. తలాలు ఘర్షణలేనివని అనుకుని, ఆ రెండు దిమ్మల ద్రవ్యరాశికేంద్రం యొక్క త్వరణం కనుగొనండి ($g = 10\ ms^{-2}$)




Options :

1. $\frac{5(\sqrt{3}-1)}{2}$
2. $\frac{5(\sqrt{3}-1)}{2\sqrt{2}}$
3. $\frac{5(\sqrt{3}+1)}{2\sqrt{2}}$
4. $\frac{5(\sqrt{3}-1)}{\sqrt{2}}$

(A) $\frac{5(\sqrt{3}-1)}{2}$
(B) $\frac{5(\sqrt{3}-1)}{2\sqrt{2}}$
(C) $\frac{5(\sqrt{3}+1)}{2\sqrt{2}}$
(D) $\frac{5(\sqrt{3}-1)}{\sqrt{2}}$

**Answer: (B)** $\frac{5(\sqrt{3}-1)}{2\sqrt{2}}$ · The council's preliminary key

## Q59 AP EAPCET 2024 · 21 May · Shift 1 MCQ

A body of mass $1.5\ kg$ is moving towards south with a uniform velocity of $8\ ms^{-1}$. A force of $6\ N$ is applied to the body towards east. The displacement of the body $3$ seconds after the application of the force is

(A) $24\ m$
(B) $30\ m$
(C) $18\ m$
(D) $42\ m$

**Answer: (B)** $30\ m$ · The council's preliminary key

## Q60 AP EAPCET 2024 · 21 May · Shift 1 MCQ

The upper $\left(\frac{1}{n}\right)^{th}$ of an inclined plane is smooth and the remaining lower part is rough with coefficient of friction $\mu_k$. If a body starting from rest at the top of the inclined plane will again come to rest at the bottom of the plane, then the angle of inclination of the inclined plane is

(A) $\text{Sin}^{-1}\left[\left(\frac{n}{n-1}\right)\mu_k\right]$
(B) $\text{Sin}^{-1}\left[\left(\frac{n-1}{n}\right)\mu_k\right]$
(C) $\text{Tan}^{-1}\left[\left(\frac{n}{n-1}\right)\mu_k\right]$
(D) $\text{Tan}^{-1}\left[\frac{(n-1)\mu_k}{n}\right]$

**Answer: (D)** $\text{Tan}^{-1}\left[\frac{(n-1)\mu_k}{n}\right]$ · The council's preliminary key

## Q61 AP EAPCET 2024 · 21 May · Shift 2 MCQ

A block of metal $4\ \text{kg}$ is in rest on a frictionless surface. It was targeted by a jet releasing water of $2\ \text{kg s}^{-1}$ at a speed of $10\ \text{ms}^{-1}$. The acceleration of the block is

(A) $10\ \text{ms}^{-2}$
(B) $15\ \text{ms}^{-2}$
(C) $20\ \text{ms}^{-2}$
(D) $5\ \text{ms}^{-2}$

**Answer: (D)** $5\ \text{ms}^{-2}$ · The council's preliminary key

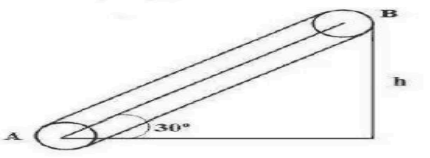
## Q62 AP EAPCET 2024 · 21 May · Shift 2 MCQ

A person climbs up a conveyor belt with a constant acceleration. The speed of the belt is $\sqrt{\frac{gh}{6}}$ and coefficient of friction is $\frac{5}{3\sqrt{3}}$. The time taken by the person to reach from A to B with maximum possible acceleration is

*(see the figure above)*

A person climbs up a conveyor belt with a constant acceleration. The speed of the belt is $\sqrt{\frac{gh}{6}}$ and coefficient of friction is $\frac{5}{3\sqrt{3}}$. The time taken by the person to reach from A to B with maximum possible acceleration is

స్థిరవడితో తిరుగుతున్న కన్వేయర్ బెల్ట్ పై ఒక వ్యక్తి స్థిర త్వరణం పైకి ఎక్కుతున్నాడు. కన్వేయర్ బెల్ట్ వడి $\sqrt{\frac{gh}{6}}$ మరియు ఘర్షణ గుణకం $\frac{5}{3\sqrt{3}}$. A నుండి B కి వ్యక్తి సాధ్యమైనంత ఎక్కువ త్వరణంతో ఎక్కుతున్నపుడు B ని చేరడానికి పట్టే కాలం




Options :

1. $\sqrt{\frac{hg}{6}}$
2. $\sqrt{6gh}$
3. $\sqrt{\frac{2h}{g}}$
4. $\sqrt{\frac{6h}{g}}$

(A) $\sqrt{\frac{hg}{6}}$

(B) $\sqrt{6gh}$

(C) $\sqrt{\frac{2h}{g}}$

(D) $\sqrt{\frac{6h}{g}}$

**Answer: (D)** $\sqrt{\frac{6h}{g}}$ · The council's preliminary key

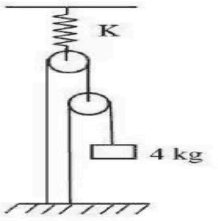
## Q63 AP EAPCET 2024 · 20 May · Shift 1 MCQ

A 4 kg mass is suspended as shown in figure. All pulleys are frictionless and spring constant K is $8 \times 10^3\ \mathrm{Nm^{-1}}$. The extension in spring is ($g = 10\ \mathrm{ms^{-2}}$)

*(see the figure above)*

A 4 kg mass is suspended as shown in figure. All pulleys are frictionless and spring constant K is $8 \times 10^3\ Nm^{-1}$. The extension in spring is ($g = 10\ ms^{-2}$)

పటంలో చూపబడినట్లు 4 kg ద్రవ్యరాశి వ్రేలాడదీయబడింది. అన్ని కప్పీలు ఘర్షణరహితం మరియు స్ప్రింగ్ స్థిరాంకం $K = 8 \times 10^3\ Nm^{-1}$ అయితే స్ప్రింగ్ లో సాగుదల ($g = 10\ ms^{-2}$)




Options :

1. 2 mm
2. 2 cm
3. 4 cm
4. 4 mm

(A) 2 mm

(B) 2 cm

(C) 4 cm

(D) 4 mm

**Answer: (B)** 2 cm · The council's preliminary key

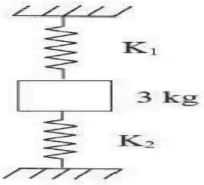
## Q64 AP EAPCET 2024 · 20 May · Shift 1 MCQ

A 3 kg block is connected as shown in the figure. Spring constants of two springs $K_1$ and $K_2$ are $50\ \mathrm{Nm^{-1}}$ and $150\ \mathrm{Nm^{-1}}$ respectively. The block is released from rest with the springs unstretched. The acceleration of the block in its lowest position is ($g = 10\ \mathrm{ms^{-2}}$)

*(see the figure above)*

A 3 kg block is connected as shown in the figure. Spring constants of two springs $K_1$ and $K_2$ are $50\ Nm^{-1}$ and $150\ Nm^{-1}$ respectively. The block is released from rest with the springs unstretched. The acceleration of the block in its lowest position is ($g = 10\ ms^{-2}$)

పటంలో చూపబడినట్లు 3 kg ల దిమ్మెను బలస్థిరాంకాలు $K_1$, $K_2$ లు వరుసగా $50\ Nm^{-1}$ మరియు $150\ Nm^{-1}$ లు గల స్ప్రింగ్ లకు కలిపారు. స్ప్రింగ్ లలో సాగుదల లేనప్పుడు దిమ్మెను విరామస్థితి నుండి వదిలారు. అయితే దిమ్మె దాని నిమ్న స్థానం వద్ద ఉన్నప్పుడు త్వరణం? ($g = 10ms^{-2}$)




Options :

1. $10\ ms^{-2}$
2. $12\ ms^{-2}$
3. $8\ ms^{-2}$
4. $8.8\ ms^{-2}$

(A) $10\ ms^{-2}$

(B) $12\ ms^{-2}$

(C) $8\ ms^{-2}$

(D) $8.8\ ms^{-2}$

**Answer: (A)** $10\ ms^{-2}$ · The council's preliminary key

## Q65 AP EAPCET 2024 · 20 May · Shift 2 MCQ

A block of metal 2 kg is in rest on a smooth plane. It is striked by a jet releasing water of $1\ kg\ s^{-1}$ at a speed of $5\ ms^{-1}$, then the acceleration of the block is

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

(B) $2.5\ ms^{-2}$

(C) $0.25\ ms^{-2}$

(D) $50\ ms^{-2}$

**Answer: (B)** $2.5\ ms^{-2}$ · The council's preliminary key

## Q66 AP EAPCET 2024 · 20 May · Shift 2 MCQ

An insect is crawling in a hemi-spherical bowl of radius 'R'. If the coefficient of friction between the insect and bowl is 'μ', then the maximum height to which the insect can crawl the bowl is

(A) $R\left[1-\frac{1}{\sqrt{1+\mu^2}}\right]$

(B) $R\left[1+\frac{1}{\sqrt{1+\mu^2}}\right]$

(C) $R\left[\frac{1}{\sqrt{1+\mu^2}}\right]$

(D) $R\left[\frac{1}{\sqrt{1-\mu^2}}\right]$

**Answer: (A)** $R\left[1-\frac{1}{\sqrt{1+\mu^2}}\right]$ · The council's preliminary key

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**Q67** AP EAPCET 2024 · 20 May · Shift 2 MCQ

A small disc is on the top of a smooth hemisphere of radius 'R'. The smallest horizontal velocity 'V' that should be imparted to the disc so that disc leaves the hemisphere surface without sliding down is (there is no friction)

(A) $V=\sqrt{g^2R}$

(B) $V=\sqrt{2gR}$

(C) $V=\sqrt{gR}$

(D) $V=\sqrt{g/R}$

**Answer: (C)** $V=\sqrt{gR}$ · The council's preliminary key

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**Q68** AP EAPCET 2024 · 20 May · Shift 2 MCQ

A block (P) is rotating in contact with the vertical wall of a rotor as shown in figures $A, B, C$. The relation between angular velocities $\omega_A, \omega_B$ & $\omega_C$ so that block does not slide down. ($R_A < R_B < R_C$ radii)

*(see the figure above)*

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A block (P) is rotating in contact with the vertical wall of a rotor as shown in figures $A, B, C$. The relation between angular velocities $\omega_A, \omega_B$ & $\omega_C$ so that block does not slide down. ($R_A < R_B < R_C$ radii)

ఒక రోటరు నిలువు గోడకు ఆనుకుని దిమ్మ (P) భ్రమణము చెందుతున్నట్లు A, B, C పటాలలో చూపబడినది. దిమ్మ కిందకి జారకుండా ఉండడానికి కోణీయ వేగాలు $\omega_A, \omega_B$ & $\omega_C$ ల మధ్య సంబంధం ($R_A < R_B < R_C$ వ్యాసార్ధాలు)

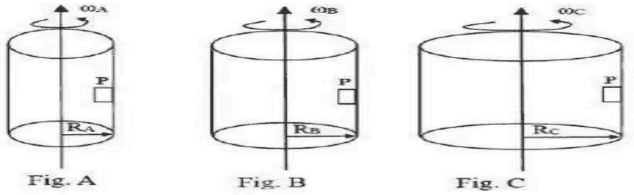


Fig. A Fig. B Fig. C

**Options :**

1. $\omega_A < \omega_B < \omega_C$
2. $\omega_A = \omega_B = \omega_C$
3. $\omega_C < \omega_B < \omega_A$
4. $\omega_C = \omega_A + \omega_B$

(A) $\omega_A < \omega_B < \omega_C$

(B) $\omega_A = \omega_B = \omega_C$

(C) $\omega_C < \omega_B < \omega_A$

(D) $\omega_C = \omega_A + \omega_B$

**Answer: (C)** $\omega_C < \omega_B < \omega_A$ · The council's preliminary key

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## Q69 AP EAPCET 2024 · 19 May · Shift 2 MCQ

A block of mass $18.5$ kg kept on a smooth horizontal surface is pulled by a rope of $3$ m length by a horizontal force of $40$ N applied to the other end of the rope. If the linear density of the rope is $0.5\ \text{kg m}^{-1}$ and initially the block is at rest, the time in which the block moves a distance of $9$ m is

(A) $3$ s

(B) $5$ s

(C) $7$ s

(D) $9$ s

**Answer: (A)** $3$ s · The council's preliminary key

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## Q70 AP EAPCET 2024 · 19 May · Shift 2 MCQ

A block of mass $1.5\,\text{kg}$ kept on a rough horizontal surface is given a horizontal velocity of $10\,\text{ms}^{-1}$. If the block comes to rest after travelling a distance of $12.5\,\text{m}$, the coefficient of kinetic friction between the surface and the block is (Acceleration due to gravity = $10\,\text{ms}^{-2}$)

(A) 0.2
(B) 0.4
(C) 0.8
(D) 0.6

**Answer: (B)** 0.4 · The council's preliminary key

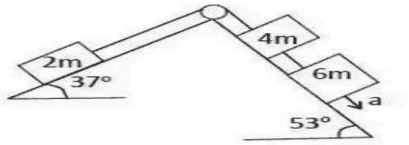
## Q71 AP EAPCET 2024 · 18 May · Shift 1 MCQ

Three blocks of masses $2\,m$, $4\,m$ and $6\,m$ are placed as shown in figure.

If $\sin 37^\circ = \frac{3}{5}$, $\sin 53^\circ = \frac{4}{5}$ the acceleration of the system is

*(see the figure above)*

Three blocks of masses 2 m, 4 m and 6 m are placed as shown in figure.
If $\sin 37^\circ = \frac{3}{5}$, $\sin 53^\circ = \frac{4}{5}$ the acceleration of the system is
2 m, 4 m, 6 m ద్రవ్య రాశులు గల మూడు దిమ్మెలను పటంలో చూపిన విధంగా అమర్చినారు. $\sin 37^\circ = \frac{3}{5}$, $\sin 53^\circ = \frac{4}{5}$ అయినచో ఇట్టి వ్యవస్థ యొక్క త్వరణం




Options :

1. $a = \frac{17}{30}g$
2. $a = \frac{13}{30}g$
3. $a = \frac{13}{15}g$
4. $a = \frac{15}{35}g$

(A) $a = \frac{17}{30}g$
(B) $a = \frac{13}{30}g$
(C) $a = \frac{13}{15}g$
(D) $a = \frac{15}{35}g$

**Answer: (A)** $a = \frac{17}{30}g$ · The council's preliminary key

## Q72 AP EAPCET 2024 · 18 May · Shift 1 MCQ

Two masses $m_1$ and $m_2$ are connected by a light string passing over smooth pulley. When set free $m_1$ moves downwards by 3 m in 3 s. The ratio of $\frac{m_1}{m_2}$ is ($g = 10\ ms^{-2}$)

(A) $\frac{9}{7}$
(B) $\frac{8}{7}$
(C) $\frac{10}{7}$
(D) $\frac{15}{13}$

**Answer: (B)** $\frac{8}{7}$ · The council's preliminary key

**Q73** TS EAPCET 2024 · 11 May · Shift 1 MCQ

A block of mass 5 kg is kept on a smooth horizontal surface. A horizontal stream of water coming out of a pipe of area of cross-section $5\ \mathrm{cm}^2$ hits the block with a velocity of $5\ \mathrm{ms}^{-1}$ and rebounds back with the same velocity. The initial acceleration of the block is (Density of water is 1 g/cc)

(A) $10\ \mathrm{ms}^{-2}$
(B) $2.5\ \mathrm{ms}^{-2}$
(C) $12.5\ \mathrm{ms}^{-2}$
(D) $5\ \mathrm{ms}^{-2}$

**Answer: (D)** $5\ \mathrm{ms}^{-2}$ · The council's preliminary key

**Q74** TS EAPCET 2024 · 10 May · Shift 1 MCQ

An aircraft executes a horizontal loop of radius 9 km at a constant speed of $540\ \mathrm{kmh}^{-1}$. The wings of the aircraft are banked at an angle of
(Acceleration due to gravity $= 10\ \mathrm{ms}^{-2}$)

(A) $\mathrm{cosec}^{-1}(4)$
(B) $\cot^{-1}(4)$
(C) $\tan^{-1}(4)$
(D) $\sec^{-1}(4)$

**Answer: (B)** $\cot^{-1}(4)$ · The council's preliminary key

**Q75** TS EAPCET 2024 · 10 May · Shift 2 MCQ

A block is kept on a rough horizontal surface. The acceleration of the block increases from $6\ \mathrm{ms}^{-2}$ to $11\ \mathrm{ms}^{-2}$ when the horizontal force acting on it increases from 20 N to 30 N. The coefficient of kinetic friction between the block and the surface is

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

(A) 0.2
(B) 0.3
(C) 0.4
(D) 0.5

**Answer: (C)** 0.4 · The council's preliminary key

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**Q76** TS EAPCET 2024 · 9 May · Shift 1 MCQ

A car is moving on circular track banked at an angle of $45^\circ$. If the maximum permissible speed of the car to avoid slipping is twice the optimum speed of the car to avoid the wear and tear of the tyres, then the coefficient of static friction between the wheels of the car and the road is

(A) 0.3
(B) 0.5
(C) 0.4
(D) 0.6

**Answer: (D)** 0.6 · The council's preliminary key

**Q77** TS EAPCET 2024 · 9 May · Shift 2 MCQ

A 20 ton truck is travelling along a curved path of radius 240 m. If the center of gravity of the truck above the ground is 2 m and the distance between its wheels is 1.5 m, the maximum speed of the truck with which it can travel without toppling over is

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

(A) $43\ \text{ms}^{-1}$
(B) $40\ \text{ms}^{-1}$
(C) $38\ \text{ms}^{-1}$
(D) $30\ \text{ms}^{-1}$

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

**Q78** TS EAPCET 2024 · 9 May · Shift 2 MCQ

A block of mass 'm' with an initial kinetic energy 'E' moves up an inclined plane of inclination '$\theta$'. If '$\mu$' is the coefficient of friction between the plane and the body, the work done against friction before coming to rest is

(A) $\mu E \cos\theta$
(B) $\dfrac{\mu E \cos\theta}{\sin\theta - \mu\cos\theta}$
(C) $\dfrac{E\mu\cos\theta}{\cos\theta + \sin\theta}$
(D) $\dfrac{\mu E\cos\theta}{\sin\theta + \mu\cos\theta}$

**Answer: (D)** $\dfrac{\mu E\cos\theta}{\sin\theta + \mu\cos\theta}$ · The council's preliminary key

**Q79** TS EAPCET 2024 · 9 May · Shift 2 MCQ

A man of mass 80 kg goes to the market on a scooter of mass 100 kg with certain speed. On application of brakes, the stopping distance is $S_1$. The man returns home on the same scooter, with

the same speed with a 60 kg bag of rice. If $S_2$ is the new stopping distance when the brakes are applied with the same force, then

(A) $7S_1 = 4S_2$
(B) $2S_1 = S_2$
(C) $3S_1 = 4S_2$
(D) $4S_1 = 3S_2$

**Answer: (D)** $4S_1 = 3S_2$ · The council's preliminary key

**Q80** AP EAPCET 2023 · 19 May · Shift 1 MCQ

A body of mass 2 kg is on an inclined plane of inclination $30^\circ$ and coefficient of friction is $\left(\frac{1}{\sqrt{3}}\right)$. The minimum force required to move the body up the inclined plane is
(Acceleration due to gravity = $10\ \mathrm{ms}^{-2}$)

(A) 5.77 N
(B) 10 N
(C) 20 N
(D) 15 N

**Answer: (C)** 20 N · The council's preliminary key

**Q81** AP EAPCET 2023 · 19 May · Shift 1 MCQ

The maximum acceleration with which a body of mass 200 kg is lowered into a well using a rope having a breaking force of 50 kg-wt is

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

(A) $7.5\ \mathrm{ms}^{-2}$
(B) $5\ \mathrm{ms}^{-2}$
(C) $3\ \mathrm{ms}^{-2}$
(D) $2.5\ \mathrm{ms}^{-2}$

**Answer: (A)** $7.5\ \mathrm{ms}^{-2}$ · The council's preliminary key

**Q82** AP EAPCET 2023 · 18 May · Shift 1 MCQ

A body of mass 10 kg is kept on a rough horizontal surface of coefficient of friction 0.3. If a horizontal force of 50 N is applied on the body, then the acceleration of the body is

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

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(A) $5\ \mathrm{ms}^{-2}$
(B) $2\ \mathrm{ms}^{-2}$
(C) $3\ \mathrm{ms}^{-2}$
(D) $1\ \mathrm{ms}^{-2}$

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

**Q83** AP EAPCET 2023 · 18 May · Shift 2 MCQ

A truck of mass M and a car of mass $\frac{M}{10}$ moving with same momentum are brought to halt by the application of same breaking force. The ratio of the distances travelled by truck and car before they come to stop is

(A) $1:10$
(B) $1:\sqrt{10}$
(C) $100:1$
(D) $5:1$

**Answer: (A)** $1:10$ · The council's preliminary key

**Q84** AP EAPCET 2023 · 18 May · Shift 2 MCQ

The force required to stop a body of mass $10\ \mathrm{kg}$ moving along a straight line path with a velocity of $10\ \mathrm{ms}^{-1}$ in a time of $10\ \mathrm{s}$ is

(A) $10\ \mathrm{N}$
(B) $1000\ \mathrm{N}$
(C) $100\ \mathrm{N}$
(D) $1\ \mathrm{N}$

**Answer: (A)** $10\ \mathrm{N}$ · The council's preliminary key

**Q85** AP EAPCET 2023 · 18 May · Shift 2 MCQ

A truck of mass 2000 kg is moving along a circular path having radius of curvature 10 m. If the banking angle is $39^\circ$, then the maximum permissible speed of the truck is

(Acceleration due to gravity $= 10\ \mathrm{ms}^{-2}$, take $\tan 39^\circ = 0.81$)

(A) $14\ \mathrm{ms}^{-1}$
(B) $5\ \mathrm{ms}^{-1}$
(C) $18\ \mathrm{ms}^{-1}$
(D) $9\ \mathrm{ms}^{-1}$

**Answer: (D)** $9\ \mathrm{ms}^{-1}$ · The council's preliminary key

**Q86** AP EAPCET 2023 · 17 May · Shift 1 MCQ

A lorry is moving on a smooth circular path of radius 50 m with a velocity of 20 $\mathrm{ms}^{-1}$. Then the banking angle of the road is

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

(A) $\tan^{-1}\frac{5}{4}$
(B) $\tan^{-1}\frac{4}{5}$
(C) $\tan^{-1}\frac{2}{5}$
(D) $\tan^{-1}\frac{5}{2}$

**Answer: (B)** $\tan^{-1}\frac{4}{5}$ · The council's preliminary key

**Q87** AP EAPCET 2023 · 17 May · Shift 1 MCQ

A body of mass 1 kg is moving with a velocity 10 $\mathrm{ms}^{-1}$ due to a constant force on a horizontal rough surface having coefficient of kinetic friction 0.4. If the constant force is removed, the body comes to rest in a time

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

(A) 2.5 s
(B) 4 s
(C) 0.4 s
(D) 0.25 s

**Answer: (A)** 2.5 s · The council's preliminary key

**Q88** AP EAPCET 2023 · 17 May · Shift 1 MCQ

A bomb at rest explodes into three pieces of equal masses. If two pieces move perpendicular to each other, each with a speed v then the speed of the third piece is

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

**Answer: (B)** $v\sqrt{2}$ · The council's preliminary key

**Q89** AP EAPCET 2023 · 17 May · Shift 2 MCQ

A stone of mass 2 kg is tied at one end of a string of length 2 m and is whirled in a horizontal circle. If the string can withstand a maximum tension of 64 N, then the permissible maximum number of rotations per minute is

(A) 19
(B) $\frac{60}{\pi}$
(C) $\frac{152}{3}\pi$
(D) $\frac{120}{\pi}$

**Answer: (D)** $\frac{120}{\pi}$ · The council's preliminary key

**Q90** AP EAPCET 2023 · 17 May · Shift 2 MCQ

Force is the mutual interaction between the bodies is according to

(A) Newton's first law of motion
(B) Newton's second law of motion
(C) Newton's third law of motion
(D) Newton's law of gravitation

**Answer: (C) Newton's third law of motion** · The council's preliminary key

**Q91** AP EAPCET 2023 · 17 May · Shift 2 MCQ

A motor vehicle of mass 1000 kg is moving on a circular road having banking angle $30^\circ$ and coefficient of friction 0.2. Then the normal reaction force on the motor vehicle is about

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

(A) 6750 N
(B) 9060 N
(C) 1070 N
(D) 13055 N

**Answer: (D) 13055 N** · The council's preliminary key

**Q92** AP EAPCET 2023 · 16 May · Shift 1 MCQ

"The uniform motion is possible when no frictional forces oppose" is the concept of

(A) The Greek thinker Aristotle
(B) The Scientist Newton
(C) The Scientist Copernicus
(D) The Scientist Galileo

**Answer: (D) The Scientist Galileo** · The council's preliminary key

**Q93** AP EAPCET 2023 · 16 May · Shift 1 MCQ

A car is moving along a circular path having coefficient of friction 0.5 and radius of curvature 16.2 m. Then the maximum velocity of the car that can travel without falling outwards is

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

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(A) $18\ \mathrm{ms}^{-1}$
(B) $32.4\ \mathrm{kmh}^{-1}$
(C) $18\ \mathrm{kmh}^{-1}$
(D) $32.4\ \mathrm{ms}^{-1}$

**Answer: (B)** $32.4\ \mathrm{kmh}^{-1}$ · The council's preliminary key

**Q94** AP EAPCET 2023 · 16 May · Shift 2 MCQ

The magnitude of the external force acting on moving bodies can be known directly by

(A) Law of conservation of angular momentum
(B) Newton's first law of motion.
(C) Newton's second law of motion.
(D) Law of conversation of energy.

**Answer: (C) Newton's second law of motion.** · The council's preliminary key

**Q95** AP EAPCET 2023 · 16 May · Shift 2 MCQ

A body of mass 10 g is tied to a string of length 0.4 m and it is whirled in a horizontal plane with a speed of $6\ \mathrm{ms}^{-1}$. Then the tension in the string is

(A) 1.9 N
(B) 36 N
(C) 0.9 N
(D) 3.6 N

**Answer: (C)** 0.9 N · The council's preliminary key

**Q96** AP EAPCET 2023 · 15 May · Shift 1 MCQ

A car of mass 1500 kg is moving with 20 $\mathrm{ms}^{-1}$ velocity. If the breaks are applied it comes to rest in 5 seconds, then the retarding force is

(A) 9000 N
(B) 6000 N
(C) 12000 N
(D) 3000 N

**Answer: (B)** 6000 N · The council's preliminary key

**Q97** AP EAPCET 2023 · 15 May · Shift 1 MCQ

A body is made to move up along an inclined plane of inclination $30^\circ$ and the coefficient of friction is 0.5, then its retardation is

(g - acceleration due to gravity)

(A) $\left(\frac{2+\sqrt{3}}{4}\right) g$
(B) $\left(\frac{2-\sqrt{3}}{4}\right) g$
(C) $\left(\frac{2-\sqrt{3}}{2}\right) g$
(D) $\left(\frac{2+\sqrt{3}}{2}\right) g$

**Answer: (A)** $\left(\frac{2+\sqrt{3}}{4}\right) g$ · The council's preliminary key

**Q98** AP EAPCET 2023 · 15 May · Shift 1 MCQ

Two springs A and B fixed at the top and are stretched by 8 cm and 16 cm respectively, when loads of 20 N and 10 N are suspended at the lower ends. The ratio of the spring constants of the springs A and B is

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

**Answer: (D)** $4:1$ · The council's preliminary key

**Q99** AP EAPCET 2023 · 15 May · Shift 2 MCQ

A block of mass 5 kg moving on a rough surface with a velocity of $4\ \mathrm{ms}^{-1}$ is stopped by the friction in 2 seconds. Then the coefficient of friction between the contact surfaces is

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

(A) 0.4
(B) 0.3
(C) 0.5
(D) 0.2

**Answer: (D)** 0.2 · The council's preliminary key

**Q100** AP EAPCET 2023 · 15 May · Shift 2 MCQ

The following is not the method of reducing friction

(A) using ball bearings
(B) applying grease
(C) applying paint
(D) forming a thin air cushion

**Answer: (C) applying paint** · The council's preliminary key

**Q101** TS EAMCET 2023 · 14 May · Shift 1 MCQ

If a man of mass 50 kg is in a lift moving down with an acceleration equal to acceleration due to gravity, then the apparent weight of the man is

(A) 0
(B) 100 N
(C) 25 N
(D) 5 N

**Answer: (A) 0** · The council's preliminary key

**Q102** TS EAMCET 2023 · 14 May · Shift 1 MCQ

A man weighing 75 kg is standing in a lift. The weight of the man standing on a weighing machine kept in the lift when the lift is moving downwards freely under gravity is

(A) zero
(B) 75 kg
(C) 84.8 kg
(D) 65.2 kg

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

**Q103** TS EAMCET 2023 · 14 May · Shift 2 MCQ

If the radii of circular paths of two particles of same mass are in the ratio of $1:2$, then to have a constant centripetal force, the ratio of their speeds should be

(A) $4:1$
(B) $1:\sqrt{2}$
(C) $1:4$
(D) $\sqrt{2}:1$

**Answer: (B)** $1:\sqrt{2}$ · The council's preliminary key

**Q104** TS EAMCET 2023 · 14 May · Shift 2 MCQ

A bomb of mass $16\ \text{kg}$ explodes into two pieces of masses $4\ \text{kg}$ and $12\ \text{kg}$. The velocity of the $12\ \text{kg}$ mass is $4\ \text{ms}^{-1}$. The kinetic energy of the second piece is

(A) $144\ \text{J}$
(B) $192\ \text{J}$
(C) $96\ \text{J}$
(D) $288\ \text{J}$

**Answer: (D)** $288\ \text{J}$ · The council's preliminary key

**Q105** TS EAMCET 2023 · 13 May · Shift 1 MCQ

A body of weight 50 N is placed on a horizontal surface as shown in the figure. The minimum force required to move the body is 28.28 N. The frictional force and the normal reaction are respectively

*(see the figure above)*

A body of weight 50 N is placed on a horizontal surface as shown in the figure. The minimum force required to move the body is 28.28 N. The frictional force and the normal reaction are respectively

బరువు 50 N గల ఒక వస్తువును క్షితిజ సమాంతర తలంపై పటంలో చూపినట్లు ఉంచారు. ఈ వస్తువును జరుపుటకు కావలసిన కనీస బలం F = 28.28 N అయిన ఘర్షణ బలం మరియు అభిలంబ ప్రతిచర్య విలువలు వరుసగా




Options :

1. 10 N, 15 N
2. 20 N, 30 N
3. 2 N, 3 N
4. 5 N, 6 N

(A) 10 N, 15 N
(B) 20 N, 30 N
(C) 2 N, 3 N
(D) 5 N, 6 N

**Answer: (B)** 20 N, 30 N · The council's preliminary key

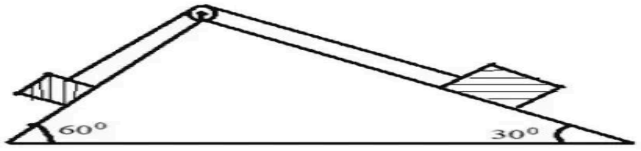
**Q106** TS EAMCET 2023 · 13 May · Shift 1 MCQ

Two blocks of equal masses are tied to the ends of a light string. The string passes over a mass less pulley fixed on frictionless surface as shown in the figure. The acceleration of the centre of mass of the blocks is
(g – acceleration due to gravity)

*(see the figure above)*

Two blocks of equal masses are tied to the ends of a light string. The string passes over a mass less pulley fixed on frictionless surface as shown in the figure. The acceleration of the centre of mass of the blocks is
(g — acceleration due to gravity)

సమాన ద్రవ్యరాశులు గల రెండు దిమ్మెలను ఒక ద్రవ్యరాశి రహిత తంత్రి చివరల బ్రేలాడదీసారు. ఆ తంత్రి పటంలోమాకినట్లు ఒక ఘర్షణ రహిత ఉపరితలానికి బిగించిన ద్రవ్యరాశి రహిత గిలకపై నుండి వెళుతుంది. అయిన ఆ దిమ్మెల ద్రవ్యరాశి కేంద్ర త్వరణము విలువ
(g — గురుత్వ త్వరణము)




Options :

1. $\left(\frac{\sqrt{3}-1}{4\sqrt{2}}\right)g$
2. $\left(\frac{\sqrt{3}+1}{4\sqrt{2}}\right)g$
3. $\left(\frac{\sqrt{3}-1}{2\sqrt{2}}\right)g$
4. $\left(\frac{\sqrt{3}+1}{2\sqrt{2}}\right)g$

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

**Answer: (A)** $\left(\frac{\sqrt{3}-1}{4\sqrt{2}}\right)g$ · The council's preliminary key

## Q107 TS EAMCET 2023 · 13 May · Shift 2 MCQ

Two blocks of masses $W_1$ and $W_2$ are suspended from the ends of a light string passing over a smooth fixed pulley. If the pulley is pulled up with an acceleration 'g', then the tension in the string will be

(A) $\frac{4W_1W_2}{W_1+W_2}g$
(B) $\frac{2W_1W_2}{W_1+W_2}g$
(C) $\frac{W_1W_2}{W_1+W_2}g$
(D) $\frac{W_1W_2}{2(W_1+W_2)}g$

**Answer: (A)** $\frac{4W_1W_2}{W_1+W_2}g$ · The council's preliminary key

## Q108 TS EAMCET 2023 · 12 May · Shift 2 MCQ

A person initially at rest, starts walking towards east without slipping or skidding. What is the type of friction acting on the person from the ground and in which direction the frictional force acts?

(A) Static friction, towards west
(B) Static friction, towards east
(C) Kinetic friction, towards west
(D) Kinetic friction, towards east

**Answer: (B) Static friction, towards east** · The council's preliminary key

**Q109** TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

At time t = 0, a force $F = \alpha t$, where t is time in seconds, is applied to a body of mass 1 kg, resting on a smooth horizontal plane. If the direction of the force makes an angle of 45° with the horizontal, then the velocity of the body at the moment of its breaking off the plane is

(A) $\frac{100}{\alpha}$ m/s
(B) $\frac{50\sqrt{2}}{\alpha}$ m/s
(C) $\frac{50\alpha}{\sqrt{2}}$ m/s
(D) $\frac{50}{\alpha}$ m/s

**Answer: (B)** $\frac{50\sqrt{2}}{\alpha}$ **m/s** · The council's preliminary key

**Q110** TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

A spherical bob of mass 250g is attached to the end of a string having length 50 cm. The bob is rotated on a horizontal circular path about a vertical axis. The maximum tension that the string can bear is 72 N. The maximum possible value of angular velocity of bob (in rad/s) is

(A) 18
(B) 24
(C) 28
(D) 32

**Answer: (B) 24** · The council's preliminary key

**Q111** TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

A motor car moving with velocity 7 m/s stops in 10 m distance when brakes are applied. What is the relation between the resistance force (R) and the weight (W) of the car? (Take value of g = 9.8 m/s$^2$)

(A) $\mathrm{R} = \mathrm{W}$

(B) $\mathrm{R} = -\mathrm{W}$

(C) $\mathrm{R} = -\frac{\mathrm{W}}{2}$

(D) $\mathrm{R} = -\frac{\mathrm{W}}{4}$

**Answer: (D)** $\mathrm{R} = -\frac{\mathrm{W}}{4}$ · The council's preliminary key

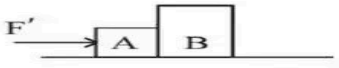
## Q112 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

A constant horizontal force $\vec{F}$ of magnitude 10 N is applied to a block A and this produces an acceleration of magnitude $20\ \mathrm{m/s^2}$. If this block A is then kept against another block B of mass 1.5 kg as shown in figure and a force $F'$ of 20 N is applied, find the force on the block B. Neglect friction.
*(see the figure above)*

**Instruction Time : 0**
**Correct Marks : 1 Wrong Marks : 0**

A constant horizontal force $\vec{F}$ of magnitude 10 N is applied to a block A and this produces an acceleration of magnitude 20 $\mathrm{m/s^2}$. If this block A is then kept against another block B of mass 1.5 kg as shown in figure and a force $F'$ of 20 N is applied, find the force on the block B. Neglect friction.

10 N పరిమాణము కల్గివున్న స్థిరక్షితిజసమాంతర బలము $\vec{F}$ ను A పై ప్రయోగించినపుడు 20 $\mathrm{m/s^2}$ పరిమాణము వున్న త్వరణాన్ని కలిగిస్తుంది. పటంలో చూపిన విధంగా దిమ్మె A యొక్క ద్రవ్యరాశి 1.5 kg కల్గివున్న, దిమ్మె B కి ఎదురుగా వుంచి 20 N ల $F'$ బలాన్ని కలిగిస్తే, B దిమ్మె మీద బలాన్ని కనుక్కోండి. మర్చణని విస్మరించండి.




**Options :**

1. 15 N
2. 10 N
3. 20 N
4. 5 N

(A) 15 N

(B) 10 N

(C) 20 N

(D) 5 N

**Answer: (A)** 15 N · The council's preliminary key

## Q113 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

A body of mass 'm' slides down along a frictionless inclined plane from height 'h' and just completes motion in a vertical circle of radius 2m after reaching the bottom. What is the value of h?
[Use $g = 10\ \mathrm{m/s^2}$]

(A) $2\ \mathrm{m}$
(B) $\frac{5}{2}\ \mathrm{m}$
(C) $5\ \mathrm{m}$
(D) $10\ \mathrm{m}$

**Answer: (C)** $5\ \mathrm{m}$ · The council's preliminary key

## Q114 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

Two blocks of masses 1 kg and 2 kg connected by a light rod and the system is slipping down a rough incline angle $45^\circ$ with the horizontal. The frictional coefficient at both the contacts is 0.4. If the acceleration of the system is $\alpha\sqrt{2}$, the value of $\alpha$ is
(Use g = 10m/s$^2$)

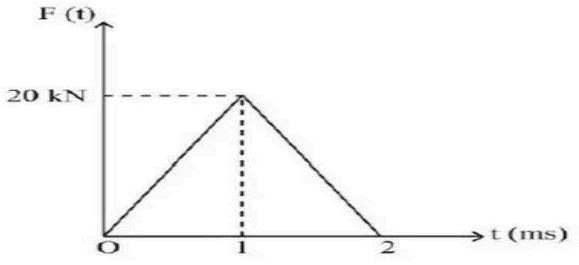
(A) $4$
(B) $3$
(C) $2$
(D) $6$

**Answer: (B)** $3$ · The council's preliminary key

## Q115 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

A time varying force acts on a ball of mass 100 g for 2 ms. The force versus time curve is shown below. If the initial speed of the ball is 10 m/s, then the speed of ball after 2 ms is
*(see the figure above)*

A time varying force acts on a ball of mass 100 g for 2 ms. The force versus time curve is shown below. If the initial speed of the ball is 10 m/s, then the speed of ball after 2 ms is




Options :

1. 210 m/s
2. 410 m/s
3. 200 m/s
4. 400 m/s

(A) $210\ \mathrm{m/s}$
(B) $410\ \mathrm{m/s}$
(C) $200\ \mathrm{m/s}$
(D) $400\ \mathrm{m/s}$

**Answer: (A)** $210\ \mathrm{m/s}$ · Checked by our team

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**Q116** TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

A block is placed on a parabolic shape ramp given by equation $y = \frac{x^2}{20}$. If the coefficient of static friction ($\mu_s$) is 0.5, then what is the maximum height above the ground at which the block can be placed without slipping?

(A) 2.5 m
(B) 1.25 m
(C) 0.5 m
(D) 0.25 m

**Answer: (B)** 1.25 m · The council's preliminary key

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**Q117** AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

An object requires 500 N force to be pulled up on a $30^\circ$ frictionless smooth inclined plane at a constant speed. The weight of the object is

(A) $500\sqrt{2}\ \mathrm{N}$
(B) $1000\ \mathrm{N}$
(C) $1000\sqrt{2}\ \mathrm{N}$
(D) $500\sqrt{3}\ \mathrm{N}$

**Answer: (B)** $1000\ \mathrm{N}$ · The council's preliminary key

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**Q118** AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

A block of mass 8 kg is suspended by a rope of length 3 m from the ceiling. A force of 40 N is applied horizontally to the block. Then the angle that the rope makes with the vertical in equilibrium is (acceleration due to gravity $= 10\ \mathrm{m\,s^{-2}}$, neglect the mass of the rope)

(A) $\sin^{-1}\left(\frac{1}{2}\right)$
(B) $\tan^{-1}\left(\frac{1}{2}\right)$
(C) $\sin^{-1}\left(\frac{1}{3}\right)$
(D) $\tan^{-1}\left(\frac{1}{3}\right)$

**Answer: (B)** $\tan^{-1}\left(\frac{1}{2}\right)$ · The council's preliminary key

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**Q119** AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

A block of 10 kg mass is connected to the top of a frictionless inclined plane of inclination $45^\circ$ by a spring of negligible mass, unstretched length 0.8 m and spring constant $100\sqrt{2}\ \mathrm{Nm^{-1}}$. Then the distance of the block from the top along the incline in the equilibrium position is
(acceleration due to gravity $= 10\ \mathrm{m\,s^{-2}}$)

(A) $0.9\ \mathrm{m}$
(B) $1.1\ \mathrm{m}$
(C) $1.3\ \mathrm{m}$
(D) $1.5\ \mathrm{m}$

**Answer: (C)** $1.3\ \mathrm{m}$ · The council's preliminary key

**Q120** AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

A block is lying at rest inside a bus. The maximum acceleration of the bus such that the block remain stationary
(the static friction coefficient = 0.2, acceleration due to gravity = $10\ \mathrm{m\,s^{-2}}$)

(A) $1\ \mathrm{m\,s^{-2}}$
(B) $0.5\ \mathrm{m\,s^{-2}}$
(C) $2\ \mathrm{cm\,s^{-2}}$
(D) $2\ \mathrm{m\,s^{-2}}$

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

**Q121** AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

Three forces of magnitude $F_1$, $F_2$ and $F_3$ act on a body located at the origin as shown in the figure. The condition that gives zero net force is
*(see the figure above)*

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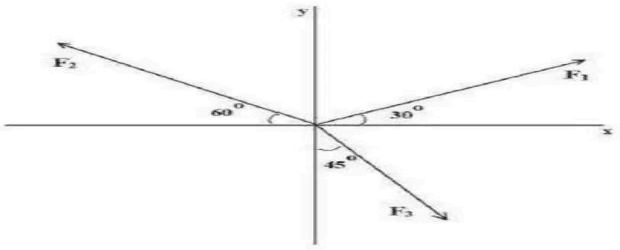
Three forces of magnitude $F_1$, $F_2$ and $F_3$ act on a body located at the origin as shown in the figure. The condition that gives zero net force is

మూల బిందువు వద్ద ఉన్న ఒక వస్తువు పై $F_1$, $F_2$ మరియు $F_3$ పరిమాణాలు గల మూడు బలాలు పటములో చూపినట్లు ప్రయోగింపబడినవి. ఆ వస్తువు పై ఫలితబలం సూన్యం కావలెనన్న $F_1$, $F_2$ మరియు $F_3$ విలువలు ఈ విధంగా ఉండవలెను.




**Options :**

1. $F_2 = -(2+\sqrt{3})F_1 : \quad F_3 = \frac{-4}{\sqrt{6}-\sqrt{2}}F_1$
2. $F_2 = -(2-\sqrt{3})F_1 : \quad F_3 = \frac{-4}{\sqrt{6}+\sqrt{2}}F_1$
3. $F_2 = -(2+\sqrt{3})F_1 : \quad F_3 = \frac{-2}{\sqrt{6}+\sqrt{2}}F_1$
4. $F_2 = -(2+\sqrt{2})F_1 : \quad F_3 = \frac{-2}{\sqrt{6}-\sqrt{2}}F_1$

(A) $F_2 = -(2+\sqrt{3})F_1 : F_3 = \frac{-4}{\sqrt{6}-\sqrt{2}}F_1$

(B) $F_2 = -(2-\sqrt{3})F_1 : F_3 = \frac{-4}{\sqrt{6}+\sqrt{2}}F_1$

(C) $F_2 = -(2+\sqrt{3})F_1 : F_3 = \frac{-2}{\sqrt{6}+\sqrt{2}}F_1$

(D) $F_2 = -(2+\sqrt{2})F_1 : F_3 = \frac{-2}{\sqrt{6}-\sqrt{2}}F_1$

**Answer: (A)** $F_2 = -(2+\sqrt{3})F_1 : F_3 = \frac{-4}{\sqrt{6}-\sqrt{2}}F_1$ · The council's preliminary key

## Q122 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

In the case of a wire, having negligible mass suspended from ceiling and stretched under the action of a weight F suspended from its other end, the tension at any cross-section of the wire is

(A) Zero

(B) $2\,\mathrm{F}$

(C) $0.5\,\mathrm{F}$

(D) $\mathrm{F}$

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

## Q123 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

Consider three masses $M_1$, $M_2$ and $M_3$ ($M_1 > M_2 > M_3$) are at rest on a horizontal plane as shown in the figure. Now the angle of inclination ($\theta$) of the plane is gradually increased until the masses just begin to slide. (Assume the co-efficient of static friction between the masses and the surface is constant). Then the correct statement of the following is

*(see the figure above)*

Consider three masses $M_1$, $M_2$ and $M_3$ ($M_1 > M_2 > M_3$) are at rest on a horizontal plane as shown in the figure. Now the angle of inclination ($\theta$) of the plane is gradually increased until the masses just begin to slide. (Assume the co-efficient of static friction between the masses and the surface is constant).
Then the correct statement of the following is

పటంలో చూపినట్లు ద్రవ్యరాశులు $M_1$, $M_2$ మరియు $M_3$ ($M_1 > M_2 > M_3$) ఒక క్షితిజ సమాంతర తలంపై నిశ్చలంగా ఉన్నాయి. ఆ ద్రవ్యరాశులు జారడం మొదలు పెట్టేవరకు ఆ తలం యొక్క వాలు కోణం ($\theta$) క్రమంగా పెంచారు. (వాలు తలం, ద్రవ్యరాశుల మధ్య స్థైతిక ఘర్షణ గుణకం స్థిరంగా ఉందనుకోనుము).
అయిన క్రింది వానిలో సరియైన ప్రవచనం




Options :

1. $M_3$ begins to slide at a higher inclination angle than $M_1$ & $M_2$
   $M_1$ & $M_2$ ల కన్నా $M_3$ అధిక వాలుకోణం వద్ద జారడం మొదలవుతుంది.
2. $M_3$ begins to slide at a lower inclination angle than $M_1$ & $M_2$
   $M_1$ & $M_2$ ల కన్నా $M_3$ తక్కువ వాలుకోణం వద్ద జారడం మొదలవుతుంది.
3. $M_1$, $M_2$ & $M_3$ begins to slide at the same inclination angle
   $M_1$,$M_2$ & $M_3$ లు అన్ని ఒకే వాలు కోణం వద్ద జారడం మొదలవుతాయి
4. $M_2$ begins to slide at a higher inclination angle than $M_1$ & $M_3$
   $M_1$ & $M_3$ ల కన్నా $M_2$ అధిక వాలుకోణం వద్ద జారడం మొదలవుతుంది.

(A) $M_3$ begins to slide at a higher inclination angle than $M_1$ & $M_2$
(B) $M_3$ begins to slide at a lower inclination angle than $M_1$ & $M_2$
(C) $M_1$, $M_2$ & $M_3$ begins to slide at the same inclination angle
(D) $M_2$ begins to slide at a higher inclination angle than $M_1$ & $M_3$

**Answer: (C) $M_1$, $M_2$ & $M_3$ begins to slide at the same inclination angle** · The council's preliminary key

## Q124 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

A block of mass 5 kg starts up a $45^\circ$ incline plane with initial kinetic energy of 100 J. If the coefficient of friction between block and plane is 0.5 then the distance covered by the block before it stops is (Acceleration due to gravity = $10\ \mathrm{m\,s^{-2}}$)

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

**Answer: (A) $\frac{4\sqrt{2}}{3}$ m** · The council's preliminary key

## Q125 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

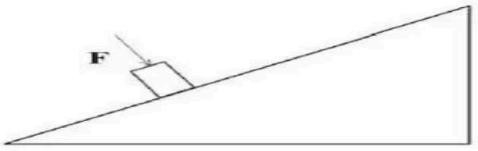
A box of mass 2 kg is placed on a inclined plane that makes $30^\circ$ with the horizontal. The coefficient of friction between the box and inclined plane is 0.2. A force F is applied on the box perpendicular to the incline to prevent the box from sliding down. The minimum value of F is
(acceleration due to gravity = $10\ \mathrm{m\,s^{-2}}$)
*(see the figure above)*

A box of mass 2 kg is placed on a inclined plane that makes 30° with the horizontal. The coefficient of friction between the box and inclined plane is 0.2. A force F is applied on the box perpendicular to the incline to prevent the box from sliding down. The minimum value of F is

(acceleration due to gravity = 10 m $s^{-2}$)

ద్రవ్యరాశి 2 kg గల పెట్టను క్షితిజంతో 30° కోణము చేయు వాలుతలంపై ఉందారు. పెట్టె వాలు తలంల మధ్య ఘర్షణ గుణకం 0.2. పెట్టె క్రిందికి జారకుండా F బలాన్ని పెట్టెపై వాలుతలానికి లంబంగా ప్రయోగించినారు. అయితే F యొక్క కనిష్ట విలువ

(గురుత్వ త్వరణం = 10 m $s^{-2}$)




**Options :**

1. 28.6 N
2. 22.8 N
3. 32.7 N
4. 44.6 N

(A) 28.6 N
(B) 22.8 N
(C) 32.7 N
(D) 44.6 N

**Answer: (C)** 32.7 N · The council's preliminary key

## Q126 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

Which of the following is true about the coefficient of static friction ($\mu_s$) and the coefficient of kinematic friction ($\mu_k$)

(A) $\mu_s$ is always equal to $\mu_k$
(B) $\mu_s$ is always greater than $\mu_k$
(C) $\mu_s$ is always less than $\mu_k$
(D) Depending upon applications, $\mu_s$ can be greater, less or equal to $\mu_k$

**Answer: (B)** $\mu_s$ is always greater than $\mu_k$ · The council's preliminary key

## Q127 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

The coefficient of friction between object and substance, if we need to move an object of weight 150 N on a horizontal surface with a force of 75 N, is

(A) 0.8
(B) 0.5
(C) 0.7
(D) 0.9

**Answer: (B)** 0.5 · The council's preliminary key

## Q128 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

The coefficient of static friction between the road and tyres of a car is 0.4. The maximum permissible speed of the car is $10\ \mathrm{ms}^{-1}$ on curved unbanked road. Then the maximum radius of curvature of the road is
(acceleration due to gravity = $10\ \mathrm{ms}^{-2}$ )

(A) $10\sqrt{5}$ m
(B) 25 m
(C) $20\sqrt{2}$ m
(D) 30 m

**Answer: (B)** 25 m · The council's preliminary key

## Q129 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

A particle attached to a string of length r is moving on vertical circular path continuously. If the speed of the particle at the highest point is $\sqrt{7gr}$, then the ratio of the respective tension in the string holding it at the highest and the lowest points is
(g $-$ acceleration due to gravity)

(A) $1:1$
(B) $1:2$
(C) $1:7$
(D) $1:\sqrt{7}$

**Answer: (B)** $1:2$ · The council's preliminary key

## Q130 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

A boat of mass 700 kg is travelling at a speed of $24\ \mathrm{ms}^{-1}$ when its engine is shut off. The magnitude of frictional force f between boat and water is given as $f = 35v$, where v is the speed in $\mathrm{ms}^{-1}$ and f is in newton. The speed of boat becomes $6\ \mathrm{ms}^{-1}$ in time.

(A) 18 s
(B) 36 s
(C) 34 s
(D) 28 s

**Answer: (D)** 28 s · The council's preliminary key

**Q131** AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

A body is travelling with $10\ \mathrm{m\,s^{-1}}$ on a rough horizontal surface. It's velocity after 2 s is $4\ \mathrm{m\,s^{-1}}$. The co-efficient of kinetic friction between the block and the plane is (acceleration due to gravity $= 10\ \mathrm{m\,s^{-2}}$)

(A) 0.4
(B) 0.3
(C) 0.5
(D) 0.2

**Answer: (B)** 0.3 · The council's preliminary key

**Q132** AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

Ball A of mass 1 kg moving along a straight line with a velocity of $4\ \mathrm{m\,s^{-1}}$ hits another ball B of mass 3 kg which is at rest. After collision, they stick together and move with the same velocity along the same straight line. If the time of impact of the collision is 0.1 s then the force exerted on B is

(A) 30 N
(B) 24 N
(C) 36 N
(D) 27 N

**Answer: (A)** 30 N · The council's preliminary key

**Q133** AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

At the moment t = 0, a time dependent force F = at (where a is constant equal to $1\ \mathrm{Ns^{-1}}$) is applied to a body of mass 1 kg resting on a smooth horizontal plane as shown in the figure. If the direction of this force makes an angle $45^\circ$ with the horizontal, then the velocity of the body at the moment it leaves the plane is

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

*(see the figure above)*

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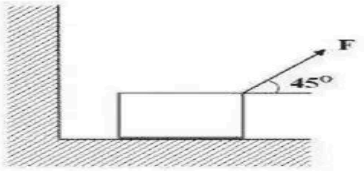
At the moment t = 0, a time dependent force F = at (where a is constant equal to 1 $Ns^{-1}$) is applied to a body of mass 1 kg resting on a smooth horizontal plane as shown in the figure. If the direction of this force makes an angle 45° with the horizontal, then the velocity of the body at the moment it leaves the plane is

(acceleration due to gravity = 10 $m\,s^{-2}$)

నునుపైన క్షితిజ సమాంతర తలాలపై విరామస్థితిలో ఉన్న 1 kg ద్రవ్యరాశిగల వస్తువు పై t = 0 సమయం వద్ద కాలంపై F = at అనే బలాన్ని ప్రయోగించారు. ఇక్కడ a = 1 $Ns^{-1}$ ఒక స్థిరాంకం పటంలో చూపినట్లు, ఈ బలం క్షితిజం తో 45° కోణం చేస్తున్నది. అయిన సమతలాన్ని విడిచేటప్పటికి ఆ వస్తువు వేగం

(గురుత్వ త్వరణం = 10 $m\,s^{-2}$)




**Options :**

1. $50\ ms^{-1}$
2. $50\sqrt{2}\ ms^{-1}$
3. $100\sqrt{2}\ ms^{-1}$
4. $100\ ms^{-1}$

(A) $50\ ms^{-1}$

(B) $50\sqrt{2}\ ms^{-1}$

(C) $100\sqrt{2}\ ms^{-1}$

(D) $100\ ms^{-1}$

**Answer: (B)** $50\sqrt{2}\ ms^{-1}$ · The council's preliminary key

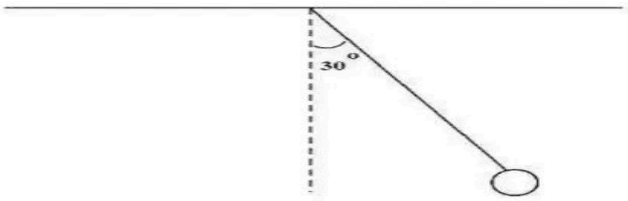
## Q134 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

An object of mass 3 kg is tied by a string of negligible mass to a ceiling and held such that the string is taut. The object is released suddenly such that the string remains taut. It's acceleration when released is

(acceleration due to gravity = 10 $m\,s^{-2}$)

*(see the figure above)*

An object of mass 3 kg is tied by a string of negligible mass to a ceiling and held such that the string is taut. The object is released suddenly such that the string remains taut. It's acceleration when released is
(acceleration due to gravity = 10 m $s^{-2}$)
పటంలో చూపినట్లు, ద్రవ్యరాశి 3 kg గల ఒక వస్తువు విస్మరించదగిన ద్రవ్యరాశి గల దారముతో బిగుతుగా గది పై కప్పు నుండి వ్రేలాడదీసారు. ఒక్కసారిగా వస్తువును వదిలిన తర్వాత కూడా ఆ దారము బిగుతుగా ఉన్నది. వదిలినప్పుడు, దాని త్వరణము
(గురుత్వ త్వరణం = 10 m $s^{-2}$)




Options :
1. 3.5 $ms^{-2}$
2. 4.9 $ms^{-2}$
3. 7.5 $ms^{-2}$
4. 6.9 $ms^{-2}$

(A) $3.5\ ms^{-2}$
(B) $4.9\ ms^{-2}$
(C) $7.5\ ms^{-2}$
(D) $6.9\ ms^{-2}$

**Answer: (B)** $4.9\ ms^{-2}$ · The council's preliminary key

## Q135 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

Two rectangular blocks of masses 40 kg and 60 kg are connected by a string and kept on a frictionless horizontal table. If a force of 1000 N is applied on 60 kg block away from 40 kg block, then the tension in string is

(A) 450 N
(B) 400 N
(C) 350 N
(D) 500 N

**Answer: (B)** 400 N · The council's preliminary key

## Q136 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

A ball of mass 0.5 kg moving horizontally at 10 $ms^{-1}$ strikes a vertical wall and rebounds with speed V. The magnitude of the change in linear momentum is found to be 8.0 $kg\ ms^{-1}$. The magnitude of V is

(A) 6.0 $\mathrm{ms}^{-1}$

(B) 9.0 $\mathrm{ms}^{-1}$

(C) 26.0 $\mathrm{ms}^{-1}$

(D) 13.0 $\mathrm{ms}^{-1}$

**Answer: (A)** 6.0 $\mathrm{ms}^{-1}$ · The council's preliminary key

## Q137 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

A cricket ball of mass 50 g having velocity $50\ \mathrm{cm\,s}^{-1}$ is stopped in 0.5 s. The force applied to stop the ball is

(A) 0.07 N

(B) 0.05 N

(C) 5 N

(D) 7 N

**Answer: (B)** 0.05 N · The council's preliminary key

## Q138 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

Two masses $M_1$ and $M_2$ are arranged as shown in the figure. Let 'a' be the magnitude of the acceleration of the mass $M_1$. If the mass of $M_1$ is doubled and that of $M_2$ is halved, then the acceleration of the system is

(Treat all surfaces as smooth ; masses of pulley and rope are negligible )

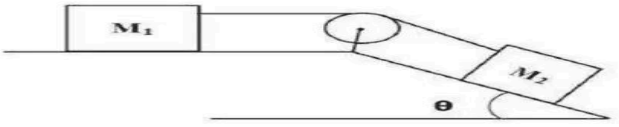
*(see the figure above)*

Two masses $M_1$ and $M_2$ are arranged as shown in the figure. Let 'a' be the magnitude of the acceleration of the mass $M_1$. If the mass of $M_1$ is doubled and that of $M_2$ is halved, then the acceleration of the system is

(Treat all surfaces as smooth ; masses of pulley and rope are negligible )

రెండు ద్రవ్యరాశులు $M_1$ మరియు $M_2$ లను పటములో చూపినట్లు అమర్చారు. $M_1$ ద్రవ్యరాశి యొక్క త్వరణము పరిమాణము a అనుకొనుము. $M_1$ ద్రవ్యరాశి ని రెండు రెట్లు మరియు $M_2$ ద్రవ్య రాశి ని సగము చేసిన వ్యవస్థ యొక్క త్వరణము

(ఉపరితలాలు ఘర్షణ రహితము, కప్పి, త్రాడుల ద్రవ్యరాశులను విస్మరించుము)




Options :

1. $\left(\frac{M_1+M_2}{4M_1+M_2}\right)a$

2. $\left(\frac{2M_1+M_2}{4M_1+M_2}\right)a$

3. $\left(\frac{M_1+2M_2}{4M_1+2M_2}\right)a$

4. $\left(\frac{M_1+2M_2}{M_1+M_2}\right)a$

(A) $\left(\frac{M_1+M_2}{4M_1+M_2}\right)a$

(B) $\left(\frac{2M_1+M_2}{4M_1+M_2}\right)a$

(C) $\left(\frac{M_1+2M_2}{4M_1+2M_2}\right)a$

(D) $\left(\frac{M_1+2M_2}{M_1+M_2}\right)a$

**Answer: (A)** $\left(\frac{M_1+M_2}{4M_1+M_2}\right)a$ · The council's preliminary key

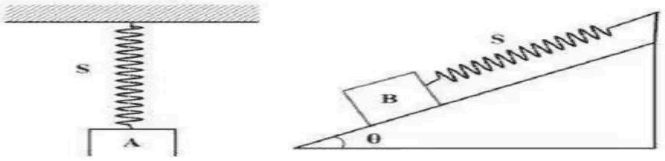
## Q139 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

As shown in the figure, an iron block A of volume $0.25\ \mathrm{m}^3$ is attached to a spring S of unstretched length 1.0 m and hanging to the ceiling of a roof. The spring gets stretched by 0.2 m. This block is removed and another block B of iron of volume $0.75\ \mathrm{m}^3$ is now attached to the same spring and kept on a frictionless incline plane of $30^\circ$ inclination. The distance of the block from the top along the incline at equilibrium is

*(see the figure above)*

As shown in the figure, an iron block A of volume $0.25\ \mathrm{m}^3$ is attached to a spring S of unstretched length 1.0 m and hanging to the ceiling of a roof. The spring gets stretched by 0.2 m. This block is removed and another block B of iron of volume $0.75\ \mathrm{m}^3$ is now attached to the same spring and kept on a frictionless incline plane of $30^\circ$ inclination. The distance of the block from the top along the incline at equilibrium is

పటంలో చూపిన విధంగా ఘన పరిమాణం $0.25\ \mathrm{m}^3$ గల ఒక దిమ్మె A ను, గది పైకప్పుకు వ్రేలాడ దీసిన 1.0 m సహజ పొడవు గల స్ప్రింగ్ S కు తగిలించారు. అపుడు ఆ స్ప్రింగ్ 0.2 m సాగినది. తర్వాత ఆ దిమ్మెను తొలగించి, $0.75\ \mathrm{m}^3$ ఘన పరిమాణం గల మరొక ఇనుప దిమ్మె B ను ఆ స్ప్రింగ్ కు తగిలించి, $30^\circ$ వాలుగా నునుపైన వాలు తలంపై ఉంచినారు. ఇపుడు, వాలు తలం మీద పైనుండి సమతా స్థితిలో ఉన్న ఆ దిమ్మె దూరము




Options :

1. 1.1 m
2. 1.3 m
3. 1.6 m
4. 1.9 m

(A) 1.1 m

(B) 1.3 m

(C) 1.6 m

(D) 1.9 m

**Answer: (B)** 1.3 m · The council's preliminary key

## Q140 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

A 500 $kg$ car takes a round turn of radius 50 $m$ with a velocity of 36 $kmph$. The centripetal force acting on the car is _____

(A) $250\ N$
(B) $500\ N$
(C) $750\ N$
(D) $1000\ N$

**Answer: (D)** $1000\ N$ · The council's preliminary key

## Q141 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

When a vehicle of mass $m$ is moving with a velocity $v$ over a concave over-bridge, of radius of curvature $r$, the thrust on the road at the lowest point on the bridge will be _____

(A) $mg + \frac{mv^2}{r}$
(B) $mg - \frac{mv^2}{r}$
(C) $\frac{m^2v^2g}{r}$
(D) $\frac{v^2g}{r}$

**Answer: (A)** $mg + \frac{mv^2}{r}$ · The council's preliminary key

## Q142 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

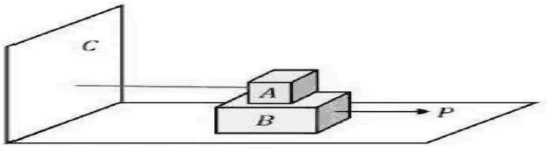
Block 'A' of mass $100\ \text{kg}$ is kept above another block 'B' of mass $300\ \text{kg}$. 'A' is tied to the wall 'C' with a horizontal string. The coefficient of friction between 'A' and 'B' is 0.35 and that between 'B' and the horizontal surface is 0.5. Find the horizontal force $P$, necessary to move the block 'B'.
*(see the figure above)*

Mandatory : No

AP EAPCET 2021

AP EAPCET 2021

Block '$A$' of mass 100 $kg$ is kept above another block '$B$' of mass 300 $kg$. '$A$' is tied to the wall '$C$' with a horizontal string. The coefficient of friction between '$A$' and '$B$' is 0.35 and that between '$B$' and the horizontal surface is 0.5. Find the horizontal force $P$, necessary to move the block '$B$'.




100 $kg$ ద్రవ్యరాశి గల దిమ్మ '$A$', 300 $kg$ ద్రవ్యరాశి గల మరొక దిమ్మ '$B$' పైన ఉన్నది. '$A$' దిమ్మ క్షితిజ సమాంతర తీగతో '$C$' అను గోడకు కట్టబడి యున్నది. '$A$' మరియు '$B$' ల మధ్య ఘర్షణ గుణకము 0.35 మరియు '$B$' కి తలమునకు మధ్య 0.5. దిమ్మ '$B$' కదలడానికి అవసరమగు క్షితిజ సమాంతర బలము $P$ _____

Options :
1. 1150 $N$
2. 1250 $N$
3. 2350 $N$
4. 1420 $N$

(A) $1150\ \mathrm{N}$
(B) $1250\ \mathrm{N}$
(C) $2350\ \mathrm{N}$
(D) $1420\ \mathrm{N}$

**Answer: (C)** $2350\ \mathrm{N}$ · The council's preliminary key

**Q143** AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

Two bodies having masses in the ratio $2:3$ fall freely under gravity from heights which are in the ratio $9:16$. The ratio of their linear momenta on touching the ground is _____

(A) $2:9$
(B) $3:16$
(C) $1:2$
(D) $3:2$

**Answer: (C)** $1:2$ · The council's preliminary key

**Q144** AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

A particle of mass $5\,\mathrm{kg}$ is moving on a circle of radius $1\,\mathrm{m}$ with an angular velocity of $2\,\mathrm{rad.s^{-1}}$. The centripetal force is _____

(A) $10\,\mathrm{N}$
(B) $40\,\mathrm{N}$
(C) $30\,\mathrm{N}$
(D) $20\,\mathrm{N}$

**Answer: (D)** $20\,\mathrm{N}$ · The council's preliminary key

**Q145** AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

A body of weight $64\,\mathrm{N}$ is pushed with just enough force to start it moving across a horizontal floor and the same force continues to act afterwards. If the coefficients of static and dynamic frictions are 0.8 and 0.6 respectively, the acceleration of the body will be _____

(A) $0.2\,g$
(B) $\frac{g}{32}$
(C) $0.64\,g$
(D) $\frac{g}{6.4}$

**Answer: (A)** $0.2\,g$ · The council's preliminary key

**Q146** AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

An object is in equilibrium when four concurrent forces, acting in the same plane, are in the directions shown in the figure. Find the magnitudes of $F_1$ and $F_2$. *(see the figure above)*

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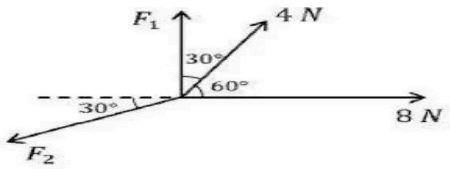
**Mandatory : No**

An object is in equilibrium when four concurrent forces, acting in the same plane, are in the directions shown in the figure. Find the magnitudes of $F_1$ and $F_2$.




పటములో చూపిన విధముగా 4 అనుషక్త బలాల వలన ఒక వస్తువు సమతాస్థితిలో ఉన్నది. అయితే $F_1, F_2$ ల పరిమాణాలు

**Options :**

1. $\frac{2}{\sqrt{3}}\ N\ \&\ \frac{20}{\sqrt{3}}\ N$

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2. $\frac{4}{\sqrt{3}}\ N\ \&\ \frac{20}{\sqrt{3}}\ N$
3. $\frac{\sqrt{3}}{2}\ N\ \&\ \frac{\sqrt{3}}{20}\ N$
4. $\frac{4}{\sqrt{3}}\ N\ \&\ \frac{10}{\sqrt{3}}\ N$

(A) $\frac{2}{\sqrt{3}}\ \mathrm{N}\ \&\ \frac{20}{\sqrt{3}}\ \mathrm{N}$
(B) $\frac{4}{\sqrt{3}}\ \mathrm{N}\ \&\ \frac{20}{\sqrt{3}}\ \mathrm{N}$
(C) $\frac{\sqrt{3}}{2}\ \mathrm{N}\ \&\ \frac{\sqrt{3}}{20}\ \mathrm{N}$
(D) $\frac{4}{\sqrt{3}}\ \mathrm{N}\ \&\ \frac{10}{\sqrt{3}}\ \mathrm{N}$

**Answer: (B)** $\frac{4}{\sqrt{3}}\ \mathrm{N}\ \&\ \frac{20}{\sqrt{3}}\ \mathrm{N}$ · The council's preliminary key

## Q147 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

What is the angle of banking of a railway track of radius of curvature $250\ \mathrm{m}$, if the maximum velocity of the train is $90\ \mathrm{kmph}$? (use $g = 10\ \mathrm{m.s^{-2}}$)

(A) $\theta = \mathrm{Tan}^{-1}\left(\frac{1}{2}\right)$
(B) $\theta = \mathrm{Tan}^{-1}\left(\frac{1}{3}\right)$
(C) $\theta = \mathrm{Tan}^{-1}\left(\frac{1}{4}\right)$
(D) $\theta = \mathrm{Tan}^{-1}\left(\frac{1}{5}\right)$

**Answer: (C)** $\theta = \mathrm{Tan}^{-1}\left(\frac{1}{4}\right)$ · The council's preliminary key

## Q148 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

When a force $\vec{F}$ given by $\vec{F} = 6\hat{i} - 18\hat{j} + 10\hat{k}$ acts on a body, it imparts an acceleration of $8\ \mathrm{m.s^{-2}}$. Then find the mass of the body _____

(A) $\frac{\sqrt{115}}{4}$ kg
(B) $10\sqrt{2}$ kg
(C) $\frac{\sqrt{115}}{2}$ kg
(D) $\frac{115}{2}$ kg

**Answer: (A)** $\frac{\sqrt{115}}{4}$ kg · The council's preliminary key

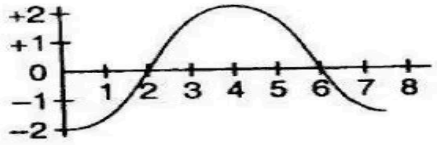
## Q149 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

A force–time ($F-t$) graph for a linear motion is shown in following figure. The segments shown are circular. The linear momentum gained between 0 and 8 seconds is:
*(see the figure above)*

**Mandatory : No**

A force–time $(F-t)$ graph for a linear motion is shown in following figure. The segments shown are circular. The linear momentum gained between 0 and 8 seconds is:

పటములో రేఖీయ చలనము యొక్క బలము-కాలము గ్రాఫు చూపబడినది. 0 మరియు 8 సెకనుల మధ్య పొందిన రేఖీయ ద్రవ్య వేగము ఎంత?




**Options :**

1. $-2\pi$ $N.s$

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AP EAPCET 2021

2. $0$ $N.s$
3. $+4\pi$ $N.s$
4. $+6\pi$ $N.s$

(A) $-2\pi$ $N.s$
(B) $0$ $N.s$
(C) $+4\pi$ $N.s$
(D) $+6\pi$ $N.s$

**Answer: (B)** $0$ $N.s$ · The council's preliminary key

## Q150 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

A body of mass $2$ $kg$ is acted upon by two forces each of magnitude $1$ $N$, making an angle of $60^\circ$ with each other. The net acceleration of the body (in $m.s^{-2}$) is:

(A) $0.5$
(B) $1.0$
(C) $\frac{\sqrt{3}}{2}$
(D) $\frac{\sqrt{2}}{3}$

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

**Q151** AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

A bullet of mass m is fired from a rifle of mass $M$. If $\vec{v}$ be the velocity of the bullet, velocity acquired by the rifle is:

(A) $\vec{V} = \frac{-M}{m}\vec{v}$
(B) $\vec{V} = \frac{-m}{M}\vec{v}$
(C) $\vec{V} = -\vec{v}$
(D) $\vec{V} = +\vec{v}$

**Answer: (B)** $\vec{V} = \frac{-m}{M}\vec{v}$ · The council's preliminary key

**Q152** AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

A shell of mass 'm', moving with velocity 'v' suddenly breaks into two pieces. If one of those parts having mass $m/6$ remains stationary, find the velocity of the other part.

(A) $\frac{6v}{5}$
(B) $2v$
(C) $\frac{3v}{4}$
(D) $\frac{4v}{3}$

**Answer: (A)** $\frac{6v}{5}$ · The council's preliminary key

**Q153** AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

A block of mass $90\ kg$ is suspended by three strings $A, B$ and $C$ as shown in figure. Tensions in the strings $A, B$ and $C$ respectively are _____ ($g = 10\ \text{m.s}^{-2}$, $\sin 37^\circ = 0.6$, $\cos 37^\circ = 0.8$)
*(see the figure above)*

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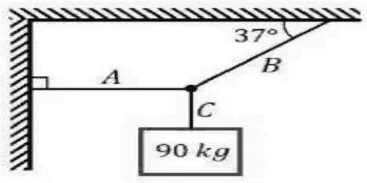
Mandatory : No

AP EAPCET 2021
AP EAPCET 2021

A block of mass 90 $kg$ is suspended by three strings $A, B$ and $C$ as shown in figure. Tensions in the strings $A, B$ and $C$ respectively are _____ $(g = 10\ m.s^{-2}, \sin 37° = 0.6, \cos 37° = 0.8)$




90 $kg$ ద్రవ్యరాశి గల ఒక దిమ్మ పటములో చూపినట్లు మూడు తీగల చేత వ్రేలాడదీయబడినది. $A, B$ మరియు $C$ తీగల తన్యతలు _____ $(g = 10\ m.s^{-2}, \sin 37° = 0.6, \cos 37° = 0.8)$

Options :

1. 400 $N$, 500 $N$ & 300 $N$
2. 500 $N$, 300 $N$ & 900 $N$
3. 300 $N$, 600 $N$ & 900 $N$
4. 1200 $N$, 1500 $N$ & 900 $N$

(A) 400 $N$, 500 $N$ & 300 $N$
(B) 500 $N$, 300 $N$ & 900 $N$
(C) 300 $N$, 600 $N$ & 900 $N$
(D) 1200 $N$, 1500 $N$ & 900 $N$

**Answer: (D)** 1200 $N$, 1500 $N$ & 900 $N$ · The council's preliminary key

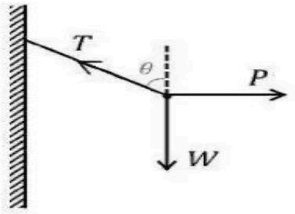
## Q154 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

A small sphere is hung by a string fixed to a wall as shown in the figure. The sphere is pushed from the wall by a stick. The forces acting on the sphere are as shown. Then, identify the incorrect expression.

*(see the figure above)*

**Mandatory : No**

A small sphere is hung by a string fixed to a wall as shown in the figure. The sphere is pushed from the wall by a stick. The forces acting on the sphere are as shown. Then, identify the incorrect expression.




ఒక చిన్న గోళము గోడకు బిగించిన త్రాడుతో వ్రేలాడదీయబడింది. ఒక కర్రతో గోళము గోడనుండి దూరంగా తోయబడినది. పటములో చూపినట్లు బలాలు పని చేస్తున్నాయి. క్రింది వానిలో తప్పు సమీకరణము _____

**Options :**

1. $P = W \tan\theta$
2. $T = P + W = 0$

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AP EAPCET 2021

3. $T^2 = P^2 + W^2$
4. $T = P + W$

(A) $P = W \tan\theta$
(B) $\vec{T} + \vec{P} + \vec{W} = 0$
(C) $T^2 = P^2 + W^2$
(D) $T = P + W$

**Answer: (D)** $T = P + W$ · The council's preliminary key

## Q155 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

An object is moving with a constant speed along a straight-line path. A force is not required to _____

(A) increase its speed
(B) decrease its momentum
(C) change its direction
(D) keep it moving with uniform velocity

**Answer: (D) keep it moving with uniform velocity** · The council's preliminary key

## Q156 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

A block $B$, lying on a table, weighs '$W$'. The coefficient of static friction between the block and the table is $\mu$. Assume that the cord between $B$ and the knot is horizontal. The maximum weight of the block $A$ for which the system will be stationary is _____

*(see the figure above)*

Mandatory : No

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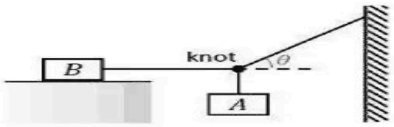
AP EAPCET 2021

A block $B$, lying on a table, weighs '$W$'. The coefficient of static friction between the block and the table is $\mu$. Assume that the cord between $B$ and the knot is horizontal. The maximum weight of the block $A$ for which the system will be stationary is _____




'$W$' భారము కలిగిన దిమ్మ $B$ ఒక బల్లపై ఉన్నది. బల్లకు, దిమ్మకు మధ్య స్థైతిక ఘర్షణ గుణకము $\mu$ . $B$ దిమ్మకు, ముడికీ మధ్య త్రాడు క్షితిజ సమాంతరముగా ఉన్నట్లు ఊహింపుము. వ్యవస్థ నిశ్చలంగా ఉండటానికి $A$ దిమ్మ యొక్క గరిష్ట భారము _____

Options :

1. $\frac{W \tan\theta}{\mu}$
2. $\mu W \tan\theta$
3. $\mu W\sqrt{1+\tan^2\theta}$
4. $\mu W \sin\theta$

(A) $\frac{W \tan\theta}{\mu}$
(B) $\mu W \tan\theta$
(C) $\mu W\sqrt{1+\tan^2\theta}$
(D) $\mu W \sin\theta$

**Answer: (B)** $\mu W \tan\theta$ · The council's preliminary key

## Q157 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

A cylinder of mass 12 $kg$ is sliding on plane with an initial velocity 20 $m.s^{-1}$. If the coefficient of friction between the surface and the cylinder is 0.5, before stopping, the cylinder describes a distance of _____

(A) 40 $m$
(B) 5 $m$
(C) 20 $m$
(D) 10 $m$

**Answer: (A)** 40 $m$ · The council's preliminary key

## Q158 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

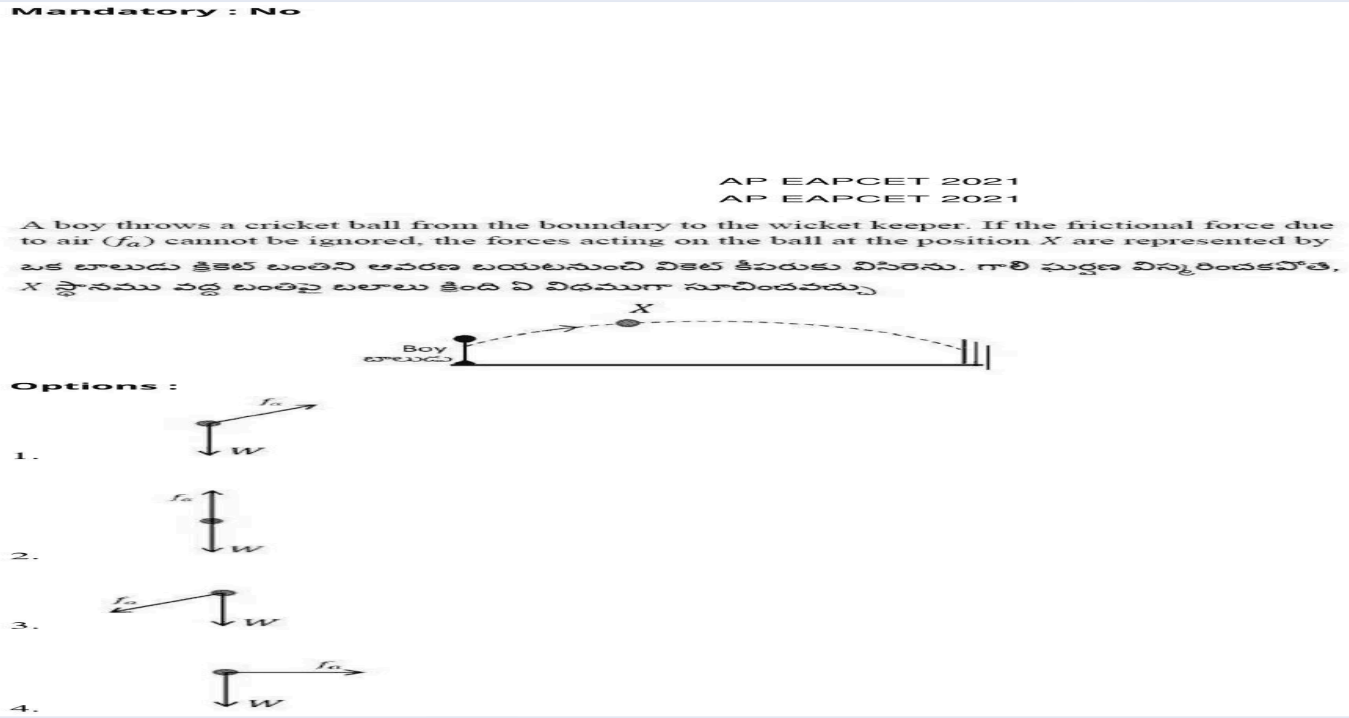
A book is lying on a table. What is the angle between the normal reaction acting on the book on the table and the weight of the book?

(A) $0^\circ$
(B) $45^\circ$
(C) $90^\circ$
(D) $180^\circ$

**Answer: (D)** $180^\circ$ · The council's preliminary key

## Q159 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

A boy throws a cricket ball from the boundary to the wicket keeper. If the frictional force due to air ( $f_a$) cannot be ignored, the forces acting on the ball at the position $X$ are represented by
*(see the figure above)*




(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

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

## Q160 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

A $30\ kg$ slab $B$ rests on a frictionless floor as shown in the figure. A $10\ kg$ block $A$ rests on top of the slab-$B$. The coefficients of static and kinetic friction between the block $A$ and the slab $B$ are $0.60$ and $0.40$ respectively. When block-$A$ is acted upon by a horizontal force of $100\ N$, as shown, find the resulting acceleration of the slab-$B$. ($g = 9.8\ m.s^{-2}$)
*(see the figure above)*

Mandatory : No

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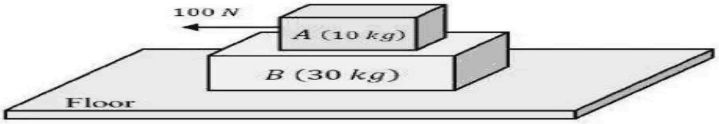
A 30 $kg$ slab $B$ rests on a frictionless floor as shown in the figure. A 10 $kg$ block $A$ rests on top of the slab-$B$. The coefficients of static and kinetic friction between the block $A$ and the slab $B$ are 0.60 and 0.40 respectively. When block-$A$ is acted upon by a horizontal force of 100 $N$, as shown, find the resulting acceleration of the slab-$B$.( g = 9.8 $m.s^{-2}$ )




30 $kg$ బరువు గల పలక పలముల్ మాపినట్లు ఘర్షణ రహిత నేలపై ఉన్నది. 10 $kg$ బరువు గల దిమ్మ పలకపై నిశ్చల స్థితిలో ఉంది. దిమ్మ మరియు పలకల మధ్య స్థైతిక ఘర్షణ గుణకము 0.60 అయితే గతిక ఘర్షణ 0.40., 10 $kg$ ల దిమ్మపై 100 $N$ ల క్షితిజ సమాంతర బలముతో పనిచేస్తుంది. g = 9.8 $m.s^{-2}$ అయితే పలక యొక్క ఫలిత త్వరణము _____

Options :

1. 0.98 $m.s^{-2}$
2. 1.47 $m.s^{-2}$
3. 1.52 $m.s^{-2}$
4. 1.31 $m.s^{-2}$

(A) 0.98 $m.s^{-2}$

(B) 1.47 $m.s^{-2}$

(C) 1.52 $m.s^{-2}$

(D) 1.31 $m.s^{-2}$

**Answer: (D)** 1.31 $m.s^{-2}$ · The council's preliminary key

## Q161 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

A ball of mass 3 $kg$, moving with a speed of 100 $m.s^{-1}$, strikes a wall at an angle 60° (as shown in figure). The ball rebounds at the same speed and remains in contact with the wall for 0.2 $sec$; the force exerted by the ball on the wall is:

*(see the figure above)*

Mandatory : No

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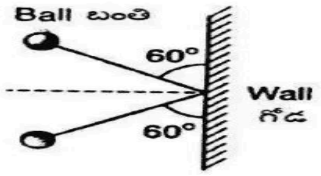
AP EAPCET 2021

A ball of mass 3 $kg$, moving with a speed of 100 $m.s^{-1}$, strikes a wall at an angle 60° (as shown in figure). The ball rebounds at the same speed and remains in contact with the wall for 0.2 $sec$; the force exerted by the ball on the wall is:




3 $kg$ ద్రవ్యరాశి గల బంతి 100 $m.s^{-1}$ వేగముతో ప్రయాణిస్తూ 60° కోణముతో గోడను ఢీకొంది. (పటములో చూపినట్లు) 0.2 $sec$ పాటు గోడతో స్పర్శలో ఉండి, అదే వేగముతో బంతి వెనుకకు ప్రయాణించినది. గోడ మీద బంతి ప్రయోగించే బలము ఎంత?

Options :

1. $1500\sqrt{3}\ N$
2. $1500\ N$
3. $300\sqrt{3}\ N$
4. $300\ N$

(A) $1500\sqrt{3}\ N$
(B) $1500\ N$
(C) $300\sqrt{3}\ N$
(D) $300\ N$

**Answer: (A)** $1500\sqrt{3}\ N$ · The council's preliminary key

## Q162 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

An object dropped in a stationary lift takes time $t_1$ to reach the floor. It takes time $t_2$ when lift is moving up with constant acceleration. Then _____

(A) $t_2 > t_1$
(B) $t_1 > t_2$
(C) $t_1 \approx t_2$
(D) $t_1 = t_2$

**Answer: (B)** $t_1 > t_2$ · The council's preliminary key

## Q163 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

When a body is placed on a rough plane (coefficient of friction$= \mu$) inclined at an angle $\theta$ to the horizontal, its acceleration is _____ (acceleration due to gravity $= g$)

(A) $g(\sin\theta - \mu\cos\theta)$

(B) $g(\sin\theta - \cos\theta)$

(C) $g\,\mu(\sin\theta - \cos\theta)$

(D) $g(\mu\sin\theta - \cos\theta)$

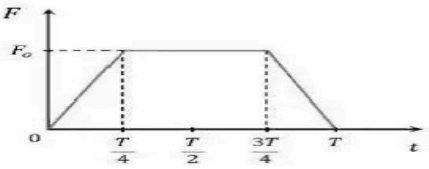
**Answer: (A)** $g(\sin\theta - \mu\cos\theta)$ · The council's preliminary key

## Q164 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

A particle of mass 'm', moving with a velocity 'v' makes an elastic collision in one dimension with a stationary particle of mass 'm'. During the collision, they remain in contact with each other for an extremely small time 'T'. Their force of contact, with time is shown in the figure. Then $F_0 =$ *(see the figure above)*

Mandatory : No

A particle of mass '$m$', moving with a velocity '$v$' makes an elastic collision in one dimension with a stationary particle of mass '$m$'. During the collision, they remain in contact with each other for an extremely small time '$T$'. Their force of contact, with time is shown in the figure. Then $F_0$ =




'$m$' ద్రవ్యరాశి కలిగి '$v$' వేగముతో ప్రయాణిస్తున్న ఒక కణము '$m$' ద్రవ్యరాశి కలిగి నిశ్చలస్థితిలో ఉన్న కణముతో వికమితీయ స్థితిస్థాపక అభిఘాతము చేస్తుంది. చాలా తక్కువ సమయము '$T$' తో అవి ఒకదానికొకటి స్పర్శలో ఉన్నాయి. వాటి స్పర్శా బలము పటములో చూపబడినది. $F_0$ యొక్క పరిమాణము _____

Options :

AP EAPCET 2021

AP EAPCET 2021

1. $\frac{2mv}{T}$
2. $\frac{4mv}{3T}$
3. $\frac{mv}{T}$
4. $\frac{3mv}{4T}$

(A) $\frac{2mv}{T}$

(B) $\frac{4mv}{3T}$

(C) $\frac{mv}{T}$

(D) $\frac{3mv}{4T}$

**Answer: (B)** $\frac{4mv}{3T}$ · The council's preliminary key

## Q165 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

A $500\ \text{kg}$ car takes a round turn of radius $50\ \text{m}$ with a velocity of $36\ \text{kmph}$. The centripetal force acting on the car is _____

(A) 250 N
(B) 750 N
(C) 1000 N
(D) 1200 N

**Answer: (C)** 1000 N · The council's preliminary key

## Q166 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

A motor cyclist wants to drive in horizontal circles on the vertical inner surface of a large cylindrical wooden well of radius 8.0 m, with minimum speed of $5\sqrt{5}\ \text{m.s}^{-1}$. The minimum value of coefficient of friction between the tires and the wall of the well must be _____ ($g = 10\ \text{m.s}^{-2}$)

(A) 0.10
(B) 0.64
(C) 0.30
(D) 0.40

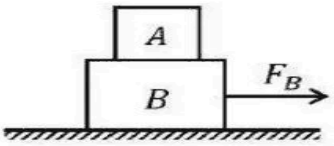
**Answer: (B)** 0.64 · The council's preliminary key

## Q167 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Two blocks $A$ and $B$ of masses 4 kg and 6 kg are as shown in the figure. A horizontal force of 12 N is required to make $A$ slip over $B$. Find the maximum horizontal force $F_B$ that can be applied on $B$ so that both $A$ and $B$ move together. (take $g = 10\ \text{m.s}^{-2}$)
*(see the figure above)*

**Mandatory : No**

Two blocks $A$ and $B$ of masses 4 $kg$ and 6 $kg$ are as shown in the figure. A horizontal force of 12 $N$ is required to make $A$ slip over $B$. Find the maximum horizontal force $F_B$ that can be applied on $B$ so that both $A$ and $B$ move together. (take $g = 10\ m.s^{-2}$)




6 $kg$ ద్రవ్యరాశి కలిగిన $B$ దిమ్మెపై జారడానికి 4 $kg$ ద్రవ్యరాశి కలిగిన $A$ దిమ్మెపై 12 $N$ బలాన్ని ప్రయోగించారు. అయితే $A$ మరియు $B$ లు కలిసి కదులుటకు $B$ దిమ్మెపై ప్రయోగించిన గరిష్ట క్షితిజ సమాంతర బలం $F_B$ ఎంత? ($g = 10\ m.s^{-2}$)

**Options :**

1. 30 $N$
2. 27 $N$
3. 32 $N$
4. 25 $N$

(A) $30\ \text{N}$
(B) $27\ \text{N}$
(C) $32\ \text{N}$
(D) $25\ \text{N}$

**Answer: (A)** $30\ \text{N}$ · The council's preliminary key

**Q168** TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

A car is moving with velocity V at the top of a semi-circular hill of radius 40 m such that the normal force on it is zero. Find the velocity (V) of the car. [use g = 10 $ms^{-2}$]

(A) $15\ \text{ms}^{-1}$
(B) $20\ \text{ms}^{-1}$
(C) $30\ \text{ms}^{-1}$
(D) $40\ \text{ms}^{-1}$

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

**Q169** TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

Imagine a person standing on a weighing machine placed inside an elevator. The elevator first accelerates, then moves with a constant velocity and finally decelerates to stop. The maximum and minimum weight recorded are $80\ \text{kg}$ and $64\ \text{kg}$ respectively. Find out the true weight of that person considering $g = 10\ \text{m/s}^2$.

(A) $70\ \text{kg}$
(B) $85\ \text{kg}$
(C) $72\ \text{kg}$
(D) $65\ \text{kg}$

**Answer: (C)** $72\ \text{kg}$ · The council's preliminary key

**Q170** TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

A ball of mass 0.2 kg moving with a speed of 20 m/s is brought to rest in 0.1 s. The average force applied to the ball is

(A) 20 N
(B) 30 N
(C) 40 N
(D) 60 N

**Answer: (C)** 40 N · The council's preliminary key

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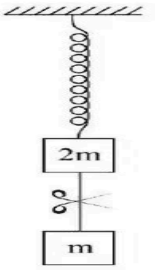
## Q171 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

A system as shown in figure is in equilibrium and is at rest. The spring and string are massless, now the string is cut. The acceleration of the masses '2m' and 'm' just after the string is cut, will be
*(see the figure above)*

A system as shown in figure is in equilibrium and is at rest. The spring and string are massless, now the string is cut. The acceleration of the masses '2m' and 'm' just after the string is cut, will be




Options :

1. $\frac{g}{2}$ upwards, g downwards
2. g upwards, $\frac{g}{2}$ downwards
3. g upwards, 2g downwards
4. 2g upwards, g downwards

(A) $\frac{g}{2}$ upwards, g downwards
(B) g upwards, $\frac{g}{2}$ downwards
(C) g upwards, 2g downwards
(D) 2g upwards, g downwards

**Answer: (A)** $\frac{g}{2}$ **upwards, g downwards** · The council's preliminary key

## Q172 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

A person is managing to be at rest between two vertical walls by pressing one wall by his hands and feet and second wall with his back. The coefficient of friction is 0.5 between his body and the wall. If the force with which the person pushes the wall is 500 N, then the mass of the person is
(Take g = 10 $m/s^2$)

(A) 80 kg
(B) 40 kg
(C) 75 kg
(D) 50 kg

**Answer: (D)** 50 kg · The council's preliminary key

**Q173** TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

An object A of mass 20 kg and travelling at 20 m/s crashes into another object B of mass 200 kg and travelling at 10 m/s, in the same direction. After the collision, object A bounces back in opposite direction at a speed of 10 m/s. The speed of the object B after the collision is

(A) 13 m/s
(B) 12 m/s
(C) 14 m/s
(D) 20 m/s

**Answer: (A)** 13 m/s · The council's preliminary key

**Q174** TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

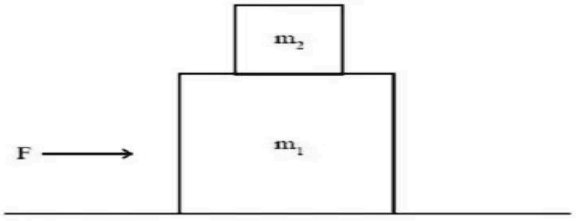
Block A of mass 3 kg rests on another block B of mass 7 kg. The coefficient of friction between A and B is 0.4 while the coefficient of friction between B and the horizontal floor on which B rests is 0.55. Find the force of friction between A and B, when a horizontal force of 50 N is applied on the block B. (Use $g = 10\ \mathrm{m/s^2}$)

(A) 0
(B) 5 N
(C) 4 N
(D) 1.2 N

**Answer: (A)** 0 · The council's preliminary key

**Q175** TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

*see figure*




What is the maximum force F that can be applied on block $m_1$, so that both $m_1$ & $m_2$ will move together? There is no friction between $m_1$ and the horizontal table. The coefficient of friction between '$m_1$' and '$m_2$' is $\mu$.

**Options :**

1. $\mu m_2 g$
2. $\mu(m_1 + m_2)g$
3. $\mu \frac{m_1 m_2}{(m_1 + m_2)} g$
4. $\mu m_1 g$

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(A) $\mu m_2 g$

(B) $\mu(m_1 + m_2)g$

(C) $\mu \frac{m_1 m_2}{(m_1+m_2)} g$

(D) $\mu m_1 g$

**Answer: (B)** $\mu(m_1 + m_2)g$ · The council's preliminary key

## Q176 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

What will be the minimum speed of the roller-coaster so that the passenger at the top, when becomes upside down, do not fall out? Consider the acceleration due to gravity as $10\ \mathrm{m/s^2}$, and the radius of curvature of the roller coaster is 10 m.

(A) $20\ \mathrm{m/s}$

(B) $10\ \mathrm{m/s}$

(C) $15\ \mathrm{m/s}$

(D) $25\ \mathrm{m/s}$

**Answer: (B)** $10\ \mathrm{m/s}$ · The council's preliminary key

## Q177 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

A car moves on a horizontal circular road of radius 16 m with increasing speed at a constant rate of $3\ \mathrm{m/s^2}$. If the coefficient of friction between the road and tyre is 0.5, then the minimum speed at which the car will skid is
(assume $g = 10\ \mathrm{m/s^2}$)

(A) $5\ \mathrm{m/s}$

(B) $10\ \mathrm{m/s}$

(C) $16\ \mathrm{m/s}$

(D) $8\ \mathrm{m/s}$

**Answer: (D)** $8\ \mathrm{m/s}$ · The council's preliminary key

## Q178 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

Consider two masses $m_1$ and $m_2$ are connected through a pulley. Mass '$m_2$' starts from rest at height 'h' and falls down. With what speed it hits the ground?
(Assume no friction and massless strings & pulleys)
*(see the figure above)*

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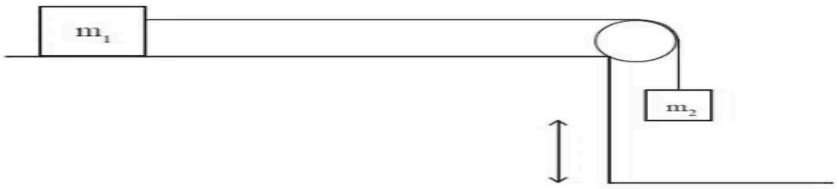
Consider two masses $m_1$ and $m_2$ are connected through a pully. Mass '$m_2$' starts from rest at height 'h' and falls down. With what speed it hits the ground?
(Assume no friction and massless strings & pulleys)




Options :

1. $\sqrt{\left(\frac{m_2}{m_1+m_2}\right)gh}$
2. $\sqrt{2gh}$
3. $\sqrt{\left(\frac{m_2}{m_1+m_2}\right)2gh}$
4. $\sqrt{\left(\frac{m_1}{m_1+m_2}\right)2gh}$

(A) $\sqrt{\left(\frac{m_2}{m_1+m_2}\right)gh}$

(B) $\sqrt{2gh}$

(C) $\sqrt{\left(\frac{m_2}{m_1+m_2}\right)2gh}$

(D) $\sqrt{\left(\frac{m_1}{m_1+m_2}\right)2gh}$

**Answer: (C)** $\sqrt{\left(\frac{m_2}{m_1+m_2}\right)2gh}$ · The council's preliminary key

## Q179 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

A free body of mass 8 $kg$ is moving at 2 $m.s^{-1}$ along a straight line. It splits into two equal parts due to an internal explosion releasing 16 J of energy, and neither part deviates from the original line of motion. Finally, _____

(A) both parts continue to move in the same direction as that of the original body

(B) one part comes to rest and the other moves in the same direction as that of the original body

(C) one part comes to rest and the other moves in the direction opposite to that of the original body

(D) one part moves in the same direction and the other in the direction opposite to that of the original body

**Answer: (B) one part comes to rest and the other moves in the same direction as that of the original body** · The council's preliminary key

**Q180** AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

Passengers standing in a bus are thrown outwards when the bus takes a sudden turn. This happens because of _____

(A) Outward pull on them
(B) Inertia
(C) Change in momentum
(D) Change in acceleration

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

**Q181** AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

The time taken by a force of $2\ \mathrm{N}$ to produce a change of momentum of $0.4\ \mathrm{kg.m.s^{-1}}$ in a body is _____

(A) $0.2\ \mathrm{s}$
(B) $0.02\ \mathrm{s}$
(C) $0.5\ \mathrm{s}$
(D) $0.05\ \mathrm{s}$

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

**Q182** AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

When will a body of mass $20\ \mathrm{kg}$ moving at $15\ \mathrm{m.s^{-1}}$, subjected to a retarding force of $100\ \mathrm{N}$, come to rest?

(A) $3\ \mathrm{s}$
(B) $6\ \mathrm{s}$
(C) $1.5\ \mathrm{s}$
(D) $9\ \mathrm{s}$

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

**Q183** AP EAMCET 2020 · 23 Sep · Shift 1 MCQ

A train is moving towards north. At one place it turns towards north-east. Here, we observe that:

(A) The radius of curvature of outer rail will be greater than that of the inner rail
(B) The radius of curvature of inner rail will be greater than that of the outer rail
(C) The radius of curvature of the outer and inner rails will be the same
(D) The radius of curvature of inner rail will be infinite

**Answer: (A) The radius of curvature of outer rail will be greater than that of the inner rail** · The council's preliminary key

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**Q184** AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

A string of a pendulum of length $l$ is displaced through $90^\circ$ from its vertical and released. Then the minimum strength of the string needed to withstand the tension as, the pendulum passes through its mean position is

(A) $mg$
(B) $3mg$
(C) $5mg$
(D) $6mg$

**Answer: (B)** $3mg$ · The council's preliminary key

**Q185** AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

A body of mass $5\ \text{kg}$ starts from the origin with an initial velocity $\vec{u} = 30\,\hat{i} + 40\,\hat{j}\ \text{m.s}^{-1}$. When a constant force $\vec{F} = -(\hat{i} + 5\hat{j})\ \text{N}$ acts on the body, the time in which the y-component of the velocity becomes zero is _____

(A) $5\ \text{s}$
(B) $20\ \text{s}$
(C) $40\ \text{s}$
(D) $80\ \text{s}$

**Answer: (C)** $40\ \text{s}$ · The council's preliminary key

**Q186** AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

A block $P$ of mass $M_P$ is in contact with another block $Q$ of mass $M_Q$ as shown in the figure, and they are placed on a smooth floor. Force on block $Q$ is _____

*(see the figure above)*

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**Orientation : Vertical**

A block $P$ of mass $M_P$ is in contact with another block $Q$ of mass $M_Q$ as shown in the figure, and they are placed on a smooth floor. Force on block $Q$ is _____

$M_P$, $M_Q$ ద్రవ్యరాశులను కలిగిన $P$ , $Q$ అనే దిమ్మెలు పటంలో చూపినట్లు స్పర్శలో ఉండి, ఒక నునుపైన తలంపై ఉంచబడ్డాయి. అయితే, $Q$ దిమ్మెపై పనిచేసే బలము ఎంత?




**Options :**

1. $\frac{M_P}{M_P+M_Q}$
2. $\frac{M_QF}{M_P+M_Q}$
3. $\frac{M_PF}{M_Q}$
4. $\frac{M_QF}{M_P}$

(A) $\frac{M_P}{M_P+M_Q}$
(B) $\frac{M_QF}{M_P+M_Q}$
(C) $\frac{M_PF}{M_Q}$
(D) $\frac{M_QF}{M_P}$

**Answer: (B)** $\frac{M_QF}{M_P+M_Q}$ · The council's preliminary key

## Q187 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

A body whose momentum is constant must have constant _____

(A) Acceleration
(B) Force
(C) Velocity
(D) mass

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

## Q188 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

A boy travelling in an open car moving at constant velocity throws a ball vertically up into air. The ball falls _____

(A) Outside the car
(B) In the car ahead of the boy
(C) In the car beside the boy
(D) Exactly in his hand

**Answer: (D) Exactly in his hand** · The council's preliminary key

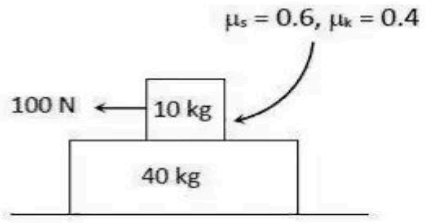
## Q189 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

If 100 N force is applied to 10 kg block as shown in the diagram, the acceleration of 40 kg slab is *(see the figure above)*

**Orientation : Vertical**

If 100 $N$ force is applied to 10 $kg$ block as shown in the diagram, the acceleration of 40 $kg$ slab is

పటంలో చూపిన విదంగా 100 $N$ బలాన్ని 10 $kg$ దిమ్మెపై ప్రయోగించిన, 40 $kg$ దిమ్మె యొక్క త్వరణం ____




**Options :**

1. $1.65\ m.s^{-2}$
2. $0.98\ m.s^{-2}$
3. $0.5\ m.s^{-2}$
4. $0.25\ m.s^{-2}$

(A) $1.65\ \mathrm{m.s^{-2}}$
(B) $0.98\ \mathrm{m.s^{-2}}$
(C) $0.5\ \mathrm{m.s^{-2}}$
(D) $0.25\ \mathrm{m.s^{-2}}$

**Answer: (B)** $0.98\ \mathrm{m.s^{-2}}$ · The council's preliminary key

## Q190 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

In a rocket, fuel burns at the rate of $1\ \mathrm{kg/s}$. This fuel is ejected form the rocket with a velocity of $60\ \mathrm{km/s}$. The force exerted on the rocket by this is _____

(A) $60\ \mathrm{N}$
(B) $600\ \mathrm{N}$
(C) $6000\ \mathrm{N}$
(D) $60000\ \mathrm{N}$

**Answer: (D)** $60000\ \mathrm{N}$ · The council's preliminary key

**Q191** AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

The minimum horizontal speed with which a body must be projected so that is goes around a smooth vertical circular track of radius $4\ \mathrm{m}$ is _____ ($g = 9.8\ \mathrm{m.s^{-2}}$)

(A) $7\ \mathrm{m.s^{-1}}$
(B) $14\ \mathrm{m.s^{-1}}$
(C) $0.7\ \mathrm{m.s^{-1}}$
(D) $1.4\ \mathrm{m.s^{-1}}$

**Answer: (B)** $14\ \mathrm{m.s^{-1}}$ · The council's preliminary key

**Q192** AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

A bomb of mass $9\,\mathrm{kg}$ explodes into two pieces of mass $3\,\mathrm{kg}$ and $6\,\mathrm{kg}$. The velocity of mass $3\,\mathrm{kg}$ is $16\,\mathrm{m/s}$. The kinetic energy of mass $6\,\mathrm{kg}$ in joule is:

(A) 96
(B) 384
(C) 192
(D) 768

**Answer: (C)** 192 · The council's preliminary key

**Q193** AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

A block of mass $m$ is placed on a smooth wedge of inclination $\theta$. The whole system is accelerated horizontally so that the block does not slip on the wedge. The force exerted by the wedge on the block ($g$ is acceleration due to gravity) will be

(A) $mg.\cos\theta$
(B) $mg.\sin\theta$
(C) $mg$
(D) $mg.\sec\theta$

**Answer: (D)** $mg.\sec\theta$ · The council's preliminary key

**Q194** AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

A person of mass $M = 90\,\mathrm{kg}$ standing on a smooth horizontal plane of ice throws a body of mass $m = 10\,\mathrm{kg}$ horizontally on the same surface. If the distance between the person and body after 10

seconds is 10 meters the K.E. of the person (in joules) is _____

(A) 0.45 J
(B) 4.5 J
(C) 0.90 J
(D) 0 J

**Answer: (A)** 0.45 J · The council's preliminary key

**Q195** AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

The tension in the spring is
*(see the figure above)*



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(A) $0\,\mathrm{N}$
(B) $10\,\mathrm{N}$
(C) $2.5\,\mathrm{N}$
(D) $5\,\mathrm{N}$

**Answer: (D)** $5\,\mathrm{N}$ · The council's preliminary key

**Q196** AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

Find the apparent weight of a body of mass $1.0\,\mathrm{kg}$ falling with an acceleration of $10\,\mathrm{m.s^{-2}}$. ($g \approx 10\,\mathrm{m.s^{-2}}$)

(A) $1\,\text{kg wt}$
(B) $2\,\text{kg wt}$
(C) $0$
(D) $0.5\,\text{kg wt}$

**Answer: (C)** $0$ · The council's preliminary key

**Q197** AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

A balloon of mass 'M' descends with an acceleration 'a'.($< g$). What mass need to be removed from the balloon so that it starts ascending with acceleration 'a'?

(A) $\frac{2M}{(a+g)}$
(B) $\frac{2Ma}{(a+g)}$
(C) $\frac{2Ma}{(a-g)}$
(D) $\frac{2Ma}{(g-a)}$

**Answer: (B)** $\frac{2Ma}{(a+g)}$ · The council's preliminary key

**Q198** AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

A bomb at rest explodes into three parts of equal mass. If the momentum of two parts are $-2p\,\hat{i}$ and $p\,\hat{j}$, find the magnitude of momentum of the third part.

(A) $p$
(B) $\sqrt{3}\,p$
(C) $\sqrt{5}\,p$
(D) $0$

**Answer: (C)** $\sqrt{5}\,p$ · The council's preliminary key

**Q199** AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

When a body slides down an inclined plane with coefficient of friction $\mu$, then its acceleration will be:

(A) $g(\sin\theta - \mu\cos\theta)$
(B) $g(\sin\theta + \mu\cos\theta)$
(C) $g(\mu\sin\theta - \cos\theta)$
(D) $g\mu(\sin\theta - \cos\theta)$

**Answer: (A)** $g(\sin\theta - \mu\cos\theta)$ · The council's preliminary key

**Q200** AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

If mass, speed and radius of the circular path of the particle are increased by 100 %, then the necessary force required to maintain the circular path will have to be increased by

(A) 100 %
(B) 250 %
(C) 300 %
(D) 400 %

**Answer: (C)** 300 % · The council's preliminary key

## Q201 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

In a circus, a stuntman rides a motor bike in a vertical circular track of radius ' $r$ '. Find the minimum speed he must maintain at highest point of track?

(A) $\sqrt{2gr}$
(B) $2\sqrt{gr}$
(C) $\sqrt{gr}$
(D) $\sqrt{5gr}$

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

## Q202 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

One end of a string of length '$l$' is connected to a particle of mass '$m$' and the other to a small peg on a smooth horizontal table. If the particle moves in a circle with speed '$v$' and '$T$' is the tension in the string, then net force on the particle (directed towards the centre) is _____

(A) $T$
(B) $0$
(C) $\frac{T+mv^2}{l}$
(D) $\frac{T-mv^2}{l}$

**Answer: (A)** $T$ · The council's preliminary key

## Q203 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

Which of the following sets of concurrent forces may be in equilibrium?

(A) $F_1 = 3\ \text{N},\ F_2 = 5\ \text{N},\ F_3 = 10\ \text{N}$
(B) $F_1 = 3\ \text{N},\ F_2 = 5\ \text{N},\ F_3 = 9\ \text{N}$
(C) $F_1 = 3\ \text{N},\ F_2 = 5\ \text{N},\ F_3 = 6\ \text{N}$
(D) $F_1 = 3\ \text{N},\ F_2 = 5\ \text{N},\ F_3 = 15\ \text{N}$

**Answer: (C)** $F_1 = 3\ \text{N},\ F_2 = 5\ \text{N},\ F_3 = 6\ \text{N}$ · The council's preliminary key

## Q204 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

Find the centripetal force acting on a coin weighing 0.1 $\text{kg}$, placed 0.1 $\text{m}$ from the centre on a gramophone disc rotating at 600 $\text{rpm}$.

(A) $4\pi^2$ N
(B) $40\pi^2$ N
(C) $\frac{\pi^2}{4}$ N
(D) $\frac{4}{\pi^2}$ N

**Answer: (A)** $4\pi^2$ N · The council's preliminary key

## Q205 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

Consider a particle is moving with a minimum speed 'v' and is at highest point of vertical circle of radius 'R'. If the radius of the circle doubled the corresponding minimum speed will be

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

**Answer: (D)** $\sqrt{2}\,v$ · Official TGCHE final key

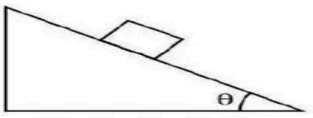
## Q206 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

A block rests on a fixed wedge inclined at an angle $\theta$. The coefficient of friction between the block and plane is $\mu$. The maximum value of $\theta$ for the block to remain motionless on the wedge is
*(see the figure above)*

Question Number : 87 Question Id : 7196501207 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 block rests on a fixed wedge inclined at an angle θ. The coefficient of friction between the block and plane is μ. The maximum value of θ for the block to remain motionless on the wedge is

θ కోణం గల స్థిర వాలు తలంపై ఒక దిమ్మె నిశ్చలంగా ఉంది. దిమ్మె మరియు తలంల మధ్య ఘర్షణ గుణకం μ అయితే దిమ్మె వాలు తలంపై కదలకుండా ఉండుటకు 'θ' యొక్క గరిష్ఠ విలువ




Options :

1. $\mu = \tan\theta$
2. $\mu = \sin\theta$
3. $\mu = \cos\theta$
4. $\mu = \cot\theta$

(A) $\mu = \tan\theta$
(B) $\mu = \sin\theta$
(C) $\mu = \cos\theta$
(D) $\mu = \cot\theta$

**Answer: (A)** $\mu = \tan\theta$ · Official TGCHE final key

## Q207 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

A block of mass 4 kg rest on a rough inclined plane making an angle of $\theta$ with the horizontal. The coefficient of static friction between the block and plane is 0.5 and the frictional force on the block is 14.14 N, Find $\theta$?

(A) $30^\circ$
(B) $45^\circ$
(C) $60^\circ$
(D) $15^\circ$

**Answer: (B)** $45^\circ$ · Official TGCHE final key

## Q208 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

Assume proton is rotating along a circular path of radius 1m under a centrifugal force of $4 \times 10^{-12}$ N. If the mass of proton is $1.6 \times 10^{-27}$ kg, then its angular velocity of rotation is

(A) $5 \times 10^7$ rad/s
(B) $10^{15}$ rad/s
(C) $2.5 \times 10^7$ rad/s
(D) $5 \times 10^{14}$ rad/s

**Answer: (A)** $5 \times 10^7$ rad/s · Official TGCHE final key

## Q209 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

The velocity of an object of mass $2\,\mathrm{Kg}$ is given by $\vec{v} = (8t\,\hat{i} + 3t^2\,\hat{j})\,m/s$ where t is time in seconds. What will be the direction of net force on the object relative to the positive direction of X - axis, at the instant when its magnitude is 20N?

(A) $\mathrm{Tan}^{-1}\left(\frac{1}{2}\right)$
(B) $\mathrm{Tan}^{-1}\left(\frac{2}{3}\right)$
(C) $\mathrm{Tan}^{-1}\left(\frac{4}{5}\right)$
(D) $\mathrm{Tan}^{-1}\left(\frac{3}{4}\right)$

**Answer: (D)** $\mathrm{Tan}^{-1}\left(\frac{3}{4}\right)$ · Official TGCHE final key

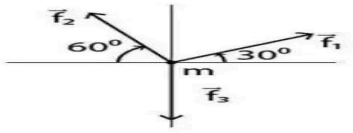
## Q210 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

A box of mass m is in equilibrium under the application of three forces as shown below. If the magnitude of $\vec{f}_1$ is 10 N, what is the magnitude of $\vec{f}_3$?
*(see the figure above)*

Question Number : 88 Question Id : 7196501368 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 box of mass m is in equilibrium under the application of three forces as shown below. If the magnitude of $\vec{f}_1$ is 10 N, what is the magnitude of $\vec{f}_3$ ?

క్రింద పటములో చూపిన విధముగా మూడు బలాలు ప్రయోగించబడి 'm' ద్రవ్యరాశి గల ఒక బాక్స్ సమతా స్థితిలో ఉన్నది. $\vec{f}_1$ పరిమాణం 10 N అయినచో, $\vec{f}_3$ పరిమాణం ఎంత ?




Options :
1. 5 N
2. 15 N
3. 20 N
4. 30 N

(A) 5 N
(B) 15 N
(C) 20 N
(D) 30 N

**Answer: (C)** 20 N · Official TGCHE final key

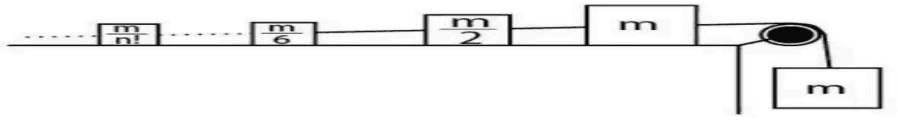
## Q211 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

An infinite number of masses are placed on a frictionless table and they are connected via massless strings. Their masses follow the sequence, $m, \frac{m}{2}, \frac{m}{6}, \ldots\ldots\ldots, \frac{m}{n!}, \ldots\ldots$ and they are further connected to a mass $m$ that hangs over a massless pulley. The acceleration of the hanging mass is
*(see the figure above)*

Question Number : 87 Question Id : 719650887 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 infinite number of masses are placed on a frictionless table and they are connected via massless strings. Their masses follow the sequence, $m$, $\frac{m}{2}$, $\frac{m}{6}$, ..... $\frac{m}{n!}$, ..... and they are further connected to a mass $m$ that hangs over a massless pulley. The acceleration of the hanging mass is

ఘర్షణ లేని ఒక బల్ల పై అపరిమిత సంఖ్యలో ద్రవ్యరాశులు ఉంచబడి, ఒకదానికొకటి ద్రవ్యరాశి రహిత తంత్రులలో కలుపబడినాయి. వాటి ద్రవ్యరాశులు వరుసగా, $m$, $\frac{m}{2}$, $\frac{m}{6}$, ..... $\frac{m}{n!}$, ..... లో ఉన్నాయి. ద్రవ్యరాశి రహిత కప్పి నుండి వేలాడుతున్న ఒక ద్రవ్యరాశి $m$ నకు అవసరమైన బలపర్చబడినట్లయితే, వేలాడుతున్న ద్రవ్యరాశి యొక్క త్వరణం లెక్కించండి




Options :

1. $\frac{g}{e-1}$
2. $\frac{g}{e+1}$
3. $\frac{g}{e}$
4. $\frac{g}{2e}$

(A) $\frac{g}{e-1}$
(B) $\frac{g}{e+1}$
(C) $\frac{g}{e}$
(D) $\frac{g}{2e}$

**Answer: (C)** $\frac{g}{e}$ · Checked by our team

## Q212 TS EAMCET 2020 · 11 Sep · Shift 1 MCQ

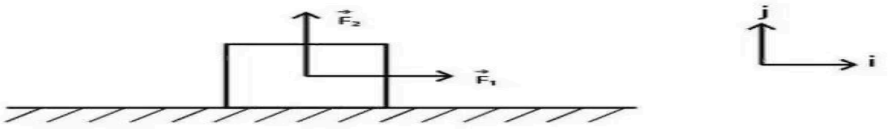
A block of mass m = 2 Kg is initially at rest on a horizontal surface. A horizontal force $\vec{F}_1 = (6N)\,\hat{i}$ and a vertical force $\vec{F}_2 = (10N)\,\hat{j}$ are then applied to the block. The coefficients of static friction and kinetic friction for the block and the surface are 0.4 and 0.25 respectively. The magnitude of the frictional force acting on the block is (Assume g = 10 m/s$^2$)

*(see the figure above)*

Question Number : 88 Question Id : 7196508888 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 block of mass m = 2 Kg is initially at rest on a horizontal surface. A horizontal force $\vec{F_1} = (6N)\,\hat{i}$ and a vertical force $\vec{F_2} = (10N)\,\hat{j}$ are then applied to the block. The coefficients of static friction and kinetic friction for the block and the surface are 0.4 and 0.25 respectively. The magnitude of the frictional force acting on the block is (Assume g = 10 m/s$^2$)

ఒక క్షితిజ సమాంతర ఉపరితలంపై m = 2 Kg ల ద్రవ్యరాశి గల ఒక బ్లాక్ లోలుత విరామంలో ఉంది. ఆ బ్లాక్‌పై క్షితిజ సమాంతర బలం $\vec{F_1} = (6N)\,\hat{i}$ మరియు నిట్టనిలువు బలం $\vec{F_2} = (10N)\,\hat{j}$ లు అనువర్తితం చేయబడ్డాయి. బ్లాక్ తలం స్థిర ఘర్షణ స్థిరాంకం మరియు గతిజ ఘర్షణ స్థిరాంకంలు వరుసగా 0.4 మరియు 0.25. బ్లాక్ పై పనిచేయు ఘర్షణ బలం పరిమాణం (g = 10 m/s$^2$ అనుకోండి)




Options :
1. 2.5 N
2. 4.0 N
3. 3.3 N
4. 3.0 N

(A) 2.5 N
(B) 4.0 N
(C) 3.3 N
(D) 3.0 N

**Answer: (A)** 2.5 N · Official TGCHE final key

## Q213 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

A circular freeway entrance and exit are commonly banked to control a moving car at 14 m/s. To design similar ramp for 28 m/s one should

(A) increase the radius by factor 2
(B) increase the radius by factor 4
(C) decrease the radius by factor 4
(D) decrease the radius by factor 2

**Answer: (B)** increase the radius by factor 4 · Official TGCHE final key

## Q214 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

A cyclist leans with the horizontal at angle $30^\circ$, while negotiating round a circular road of radius $20\sqrt{3}$ meters. The speed of the cycle should be

(A) $7\sqrt{3}\ \mathrm{m/s}$
(B) $14\ \mathrm{m/s}$
(C) $7\sqrt{6}\ \mathrm{m/s}$
(D) $10\sqrt{6}\ \mathrm{m/s}$

**Answer: (D)** $10\sqrt{6}\ \mathrm{m/s}$ · Official TGCHE final key

## Q215 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

When a bullet is fired from a rifle its momentum becomes 20 kg m/s. If the velocity of the bullet is 1000 m/s, then what is its mass?

(A) 30 g
(B) 5 kg
(C) 20 g
(D) 500 g

**Answer: (C)** 20 g · Official TGCHE final key

## Q216 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

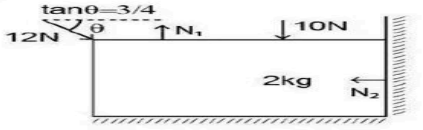
A block is between two surfaces as shown in the figure. Find the normal reaction at both surfaces. [Assume $g = 10\ m/s^2$]

*(see the figure above)*

Question Number : 88 Question Id : 814578248 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 block is between two surfaces as shown in the figure. Find the normal reaction at both surfaces.
[Assume g = 10 $m/s^2$]

పటంలో చూపిన విధంగా ఒక దిమ్మె రెండు ఉపరితలాల మధ్య ఉంచబడింది. రెండు తలాల వద్ద అభిలంబ ప్రతి చర్యను కనుగొనండి.
[g = 10 $m/s^2$ అనుకోండి]




Options :

1. $N_1 = 37.2\ N$ and $N_2 = 9.6\ N$
$N_1 = 37.2\ N$ మరియు $N_2 = 9.6\ N$

2. $N_1 = 38.2\ N$ and $N_2 = 8.6\ N$
$N_1 = 38.2\ N$ మరియు $N_2 = 8.6\ N$

3. $N_1 = 40\ N$ and $N_2 = 4\ N$
$N_1 = 40\ N$ మరియు $N_2 = 4\ N$

4. $N_1 = 37.5\ N$ and $N_2 = 9.9\ N$
$N_1 = 37.5\ N$ మరియు $N_2 = 9.9\ N$

(A) $N_1 = 37.2$ N and $N_2 = 9.6$ N
(B) $N_1 = 38.2$ N and $N_2 = 8.6$ N
(C) $N_1 = 40$ N and $N_2 = 4$ N
(D) $N_1 = 37.5$ N and $N_2 = 9.9$ N

**Answer: (A)** $N_1 = 37.2$ N and $N_2 = 9.6$ N · Official TGCHE final key

## Q217 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

A block of mass 3kg is pressed against a vertical wall by applying a force, F, at an angle $30^\circ$ to the horizontal as shown in the figure. As a result, the block is prevented from falling down. If the coefficient of static friction between the block and wall is $\sqrt{3}$, then the value of F is
(use g= 10 m/$s^2$)
*(see the figure above)*

Question Number : 88 Question Id : 7196505568 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 block of mass 3kg is pressed against a vertical wall by applying a force, F, at an angle 30° to the horizontal as shown in the figure. As a result, the block is prevented from falling down. If the coefficient of static friction between the block and wall is $\sqrt{3}$, then the value of F is
(use g= 10 m/$s^2$)

3kg ద్రవ్యరాశి ఉన్న ఒక దిమ్మె మీద F బలము 30° కోణంలో క్షితిజ సమాంతరానికి దిమ్మెను గోడకు నొక్కి పట్టుటలో చూపినట్లుగా ఉంచుతోంది. అప్పుడు దిమ్మె క్రిందకు పడకుండా సమాంతరంగా గోడకు మరియు దిమ్మెకు మధ్యగల స్థైతిక ఘర్షణ $\sqrt{3}$ అయిన, F విలువ
(g= 10 m/$s^2$ వాడండి)




Options :
1. 30 N
2. $15\sqrt{3}$ N
3. $60\sqrt{3}$ N
4. 60 N

(A) 30 N
(B) $15\sqrt{3}$ N
(C) $60\sqrt{3}$ N
(D) 60 N

**Answer: (A)** 30 N · Official TGCHE final key

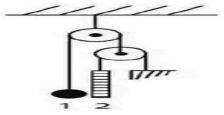
## Q218 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

In the pulley system, the mass of ball is 1.2 times greater than the mass of the rod. The length of the rod is 50 cm. The ball is set on the same level as the lower end of the rod and then released. What is the acceleration of the rod with which it comes down? Assume the pulleys and threads are massless and friction force is neglected. (Use g = 10 m/$s^2$) *(see the figure above)*

Question Number : 88 Question Id : 719650408 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

In the pulley system, the mass of ball is 1.2 times greater than the mass of the rod. The length of the rod is 50 cm. The ball is set on the same level as the lower end of the rod and then released. What is the acceleration of the rod with which it comes down? Assume the pulleys and threads are massless and friction force is neglected. (Use $g = 10\ m/s^2$)

ఒక కప్పి వ్యవస్థలో బంతి ద్రవ్యరాశి కడ్డి యొక్క ద్రవ్యరాశి కంటే 1.2 రెట్లు వుంటుంది. కడ్డి పొడవు 50 cm. బంతి మరియు కడ్డి యొక్క దిగువ భాగము ఒకే స్థాయిలో ఉండేటట్లుగా చేసి వదిలినారు. అయితే ఆ కడ్డి ఎంత త్వరణముతో క్రిందికి చేరుతుంది. కప్పిల యొక్క మరియు దారముల యొక్క ద్రవ్యరాశులు ఉపేక్షించండి మరియు ఘర్షణ బలము ఉపేక్షించండి.
($g = 10\ m/s^2$ గా తీసుకోనుము)




Options :

1. 4 m/s
2. 3 m/s
3. 2 m/s
4. 5 m/s

(A) 4 m/s
(B) 3 m/s
(C) 2 m/s
(D) 5 m/s

**Answer: (B)** 3 m/s · Checked by our team

## Q219 TS EAMCET 2019 · 4 May · Shift 1 MCQ

A 4 kg object has a velocity $(3.0\hat{i})\ \mathrm{m/s}$ at some instant. Eight seconds later, its velocity is $(8.0\hat{i} + 10.0\hat{j})\ \mathrm{m/s}$. Assuming that the object is subjected to a constant net force, the magnitude of the force is

(A) $\frac{5\sqrt{5}}{2}\ \mathrm{N}$
(B) $\frac{5\sqrt{3}}{8}\ \mathrm{N}$
(C) $\frac{8\sqrt{5}}{3}\ \mathrm{N}$
(D) $\frac{10\sqrt{3}}{7}\ \mathrm{N}$

**Answer: (A)** $\frac{5\sqrt{5}}{2}\ \mathrm{N}$ · Official TGCHE final key

## Q220 TS EAMCET 2019 · 4 May · Shift 1 MCQ

A block of mass 10 kg, initially at rest, makes a downward motion on $45^\circ$ inclined plane. Then the distance travelled by the block after 2 seconds is (Assume the coefficient of kinetic friction to be 0.3 and $g = 10\ \mathrm{ms}^{-2}$)

(A) $7\sqrt{2}\ \mathrm{m}$
(B) $\frac{9}{\sqrt{2}}\ \mathrm{m}$
(C) $10\sqrt{2}\ \mathrm{m}$
(D) $5\sqrt{2}\ \mathrm{m}$

**Answer: (A)** $7\sqrt{2}\ \mathrm{m}$ · Official TGCHE final key

## Q221 TS EAMCET 2019 · 4 May · Shift 1 MCQ

A rocket motor consumes 100 kg of fuel per second exhausting it with a speed of 5 km/s. The speed of the rocket when its mass is reduced to $\frac{1}{20}^{\text{th}}$ of its initial mass, is (Assume initial speed to be zero and ignore gravitational and viscous forces)

(A) $20\ \mathrm{km/s}$
(B) $40\ \ln(2)\ \mathrm{km/s}$
(C) $5\ \ln(20)\ \mathrm{km/s}$
(D) $10\ \ln(10)\ \mathrm{km/s}$

**Answer: (C)** $5\ \ln(20)\ \mathrm{km/s}$ · Official TGCHE final key

## Q222 TS EAMCET 2019 · 4 May · Shift 2 MCQ

An iron rod of length 1.5 m lying on a horizontal table is pulled up from one end along a vertical line so as to move it with a constant velocity 3 m/s, while the other end of the rod slides along the floor. After how much time the speed of the end sliding on the floor equals to the speed of the end being pulled up.

(A) $\frac{1}{2\sqrt{2}}$ s
(B) $\frac{1}{\sqrt{2}}$ s
(C) $3\sqrt{2}$ s
(D) $\frac{1}{4}$ s

**Answer: (A)** $\frac{1}{2\sqrt{2}}$ s · Official TGCHE final key

## Q223 TS EAMCET 2019 · 4 May · Shift 2 MCQ

In the pulley system shown in figure, the mass of A is half of that of rod B. The rod length is 500 cm. The mass of pulleys and the threads may be neglected. The mass A is set at the same level as the lower end of the rod and then released. After releasing the mass A, it would reach the top end of the rod B in time (Assume $g = 10\ \mathrm{m/s^2}$)

*(see the figure above)*

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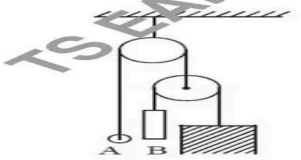
Question Number : 87 Question Id : 7512364887 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the pulley system shown in figure, the mass of A is half of that of rod B. The rod length is 500 cm. The mass of pulleys and the threads may be neglected. The mass A is set at the same level as the lower end of the rod and then released. After releasing the mass A, it would reach the top end of the rod B in time (Assume g = 10 m/s$^2$)

పటంలో చూపిన కప్పి వ్యవస్థలోని A యొక్క ద్రవ్యరాశి, కడ్డీ B ద్రవ్యరాశిలో సగం. కడ్డీ పొడవు 500 cm. కప్పిల మరియు దారాల ద్రవ్యరాశులను లెక్కించనవసరము లేదు. ద్రవ్యరాశి A మరియు కడ్డీ క్రింది అంచులను ఒకే తలంలో ఉంచి విడుదల చేసారు. విడుదల చేసిన తరువాత ద్రవ్యరాశి A, కడ్డీ B యొక్క పై అంచు చేరడానికి పట్టు కాలము (g = 10 m/s$^2$ గా తీసుకొనుము)




Options :

1. 2.0 s
2. 1.0 s
3. 3.0 s
4. 4.0 s

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(A) 2.0 s

(B) 1.0 s

(C) 3.0 s

(D) 4.0 s

**Answer: (B)** 1.0 s · Official TGCHE final key

## Q224 TS EAMCET 2019 · 4 May · Shift 2 MCQ

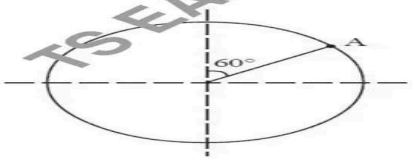
A light rigid wire of length 1 m is attached to a ball A of mass 500 g to one end. The other end of the wire is fixed, so that the wire can rotate freely in vertical plane about its fixed end. At the lowest point of the circular motion, the ball is given a horizontal velocity 6 m/s. Determine the radial component of the acceleration of the ball, when this rigid wire makes an angle $60^\circ$ with the upward vertical. (Assume $g = 10$ m/s$^2$)

*(see the figure above)*

Question Number : 88 Question Id : 75123648888 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A light rigid wire of length 1 m is attached to a ball A of mass 500 g to one end. The other end of the wire is fixed, so that the wire can rotate freely in vertical plane about its fixed end. At the lowest point of the circular motion, the ball is given a horizontal velocity 6 m/s. Determine the radial component of the acceleration of the ball, when this rigid wire makes an angle 60° with the upward vertical. (Assume g = 10 m/s²)

1 m పొడవుగల తేలికపాటి దృఢ తీగ ఒక చివర ద్రవ్యరాశి 500 g గల A బంతికి తగిలించినారు. తీగ స్వేచ్ఛగా నిట్టనిలువు తలంలో భ్రమణం చేయునట్లు తీగ రెండవ చివరను స్థిరంగా ఉంచారు. వృత్తాకార చలనంలోని కనిష్ఠ బిందువు వద్ద బంతికి 6 m/s క్షితిజ సమాంతర వేగాన్ని కలిగించారు. దృఢ తీగ నిలువు రేఖతో 60° కోణం చేయునపుడు బంతి యొక్క రేడియల్ అంశము విలువను నిర్ధారించుము. (g = 10 m/s² గా అనుకొనుము)




Options :

1. 10 m/s²
2. 6 m/s²
3. 18 m/s²
4. 25 m/s²

(A) 10 m/s²

(B) 6 m/s²

(C) 18 m/s²

(D) 25 m/s²

**Answer: (B)** 6 m/s² · Official TGCHE final key

## Q225 TS EAMCET 2019 · 3 May · Shift 1 MCQ

Two touching blocks 1 and 2 are placed on an inclined plane forming an angle $60^\circ$ with the horizontal. The masses are $m_1$ and $m_2$ and the coefficient of friction between the inclined plane and the two blocks are $1.5\ \mu$ and $1.0\ \mu$ respectively. The force of reaction between blocks during the motion is ($g$ = acceleration due to gravity)

(A) $(m_2 - m_1)\mu g$

(B) $(m_2 + m_1)\mu g$

(C) $\frac{1}{2}\frac{m_1 m_2}{m_1+m_2}\mu g$

(D) $\frac{1}{4}\frac{m_1 m_2}{m_1+m_2}\mu g$

**Answer: (D)** $\frac{1}{4}\frac{m_1 m_2}{m_1+m_2}\mu g$ · Official TGCHE final key

## Q226 TS EAMCET 2019 · 3 May · Shift 1 MCQ

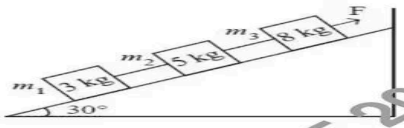
Three blocks are connected by massless strings on a frictionless inclined plane of $30^\circ$ as shown in the figure. A force of 104 N is applied upward along the incline to mass $m_3$ causing an upward motion of the blocks. What is the acceleration of the blocks? (Assume $g = 10\ \mathrm{m/s^2}$)

*(see the figure above)*

Question Number : 86 Question Id : 7512364246 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Three blocks are connected by massless strings on a frictionless inclined plane of 30° as shown in the figure. A force of 104 N is applied upward along the incline to mass $m_3$ causing an upward motion of the blocks. What is the acceleration of the blocks? (Assume $g = 10\ m/s^2$)

30° కోణం గల ఘర్షణా రహిత వాలుతలం మీద, పటంలో చూపినట్లుగా, ద్రవ్యరాశి రహిత తంత్రులతో మూడు దిమ్మెలను అనుసంధానం చేసినారు. వాలుతలం వెంట ఊర్ధ్వదిశలో 104 N ల బలాన్ని $m_3$ కు అనువర్తింపచేసినారు. అందువల్ల దిమ్మెలకు ఊర్ధ్వ చలనం కలుగుతుంది. అయితే దిమ్మెల త్వరణం ఎంత? ($g = 10\ m/s^2$గా అనుకొనుము)

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Options :

1. $6.0\ m/s^2$
2. $4.5\ m/s^2$
3. $3.0\ m/s^2$
4. $1.5\ m/s^2$

(A) $6.0\ \mathrm{m/s^2}$

(B) $4.5\ \mathrm{m/s^2}$

(C) $3.0\ \mathrm{m/s^2}$

(D) $1.5\ \mathrm{m/s^2}$

**Answer: (D)** $1.5\ \mathrm{m/s^2}$ · Official TGCHE final key

## Q227 TS EAMCET 2019 · 3 May · Shift 1 MCQ

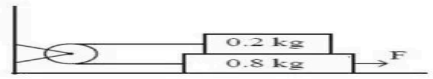
Consider a system of two masses and a pulley shown in the figure. The coefficient of friction between the two blocks and also between block and table is 0.1. Find the force, F, that must be given to the 0.8 kg block such that it attains acceleration of $5\ \mathrm{m/s^2}$. (Assume $g = 10\ \mathrm{m/s^2}$)

*(see the figure above)*

Question Number : 87 Question Id : 7512364247 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Consider a system of two masses and a pulley shown in the figure. The coefficient of friction between the two blocks and also between block and table is 0.1. Find the force, F, that must be given to the 0.8 kg block such that it attains acceleration of 5 $m/s^2$. (Assume g = 10 $m/s^2$)

పటంలో చూపిన రెండు ద్రవ్యరాశులు, ఒక కప్పీల వ్యవస్థను పరిగణించండి. రెండు దిమ్మెల మధ్య మరియు దిమ్మెకూ, బల్లకూ మధ్య ఉన్న ఘర్షణ గుణకం 0.1. 0.8 kg దిమ్మె త్వరణం 5 $m/s^2$ పొందడానికి దానికి ఇవ్వవలసిన బలం F ను కనుక్కోండి. (g = 10 $m/s^2$ గా తీసుకోనుము)




Options :

1. 6.4 N
2. 7.1 N
3. 6.9 N
4. 7.8 N

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(A) 6.4 N

(B) 7.1 N

(C) 6.9 N

(D) 7.8 N

**Answer: (A)** 6.4 N · Official TGCHE final key

## Q228 TS EAMCET 2019 · 3 May · Shift 1 MCQ

Consider a system of blocks X, A and B as shown in the figure. The blocks A and B have equal mass and are connected by a massless string through a massless pulley. The coefficient of friction between block A & X and B & X is 0.5. If block 'X' moves on horizontal frictionless surface, what should be its minimum acceleration such that blocks A and B remain stationary. ($g$ = acceleration due to gravity) *(see the figure above)*

Question Number : 94 Question Id : 7812364254 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Consider a system of blocks X, A and B as shown in the figure. The blocks A and B have equal mass and are connected by a massless string through a massless pully. The coefficient of friction between block A & X and B & X is 0.5. If block 'X' moves on horizontal frictionless surface, what should be its minimum acceleration such that blocks A and B remain stationary. (g = acceleration due to gravity)




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Options :

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

(A) $\frac{g}{3}$

(B) $3g$

(C) $\frac{g}{4}$

(D) $\frac{3g}{4}$

**Answer: (A)** $\frac{g}{3}$ · Official TGCHE final key

## Q229 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

An explosion blows a stationary rock into three parts. Two parts of masses $1\ \text{kg}$ and $2\ \text{kg}$ move at right angles to one another with velocities $12\ \text{ms}^{-1}$ and $8\ \text{ms}^{-1}$ respectively. If the velocity of third part is $4\ \text{ms}^{-1}$, the mass of the rock is

(A) $8\ \text{kg}$

(B) $5\ \text{kg}$

(C) $17\ \text{kg}$

(D) $3\ \text{kg}$

**Answer: (A)** $8\ \text{kg}$ · Official APSCHE final key

## Q230 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

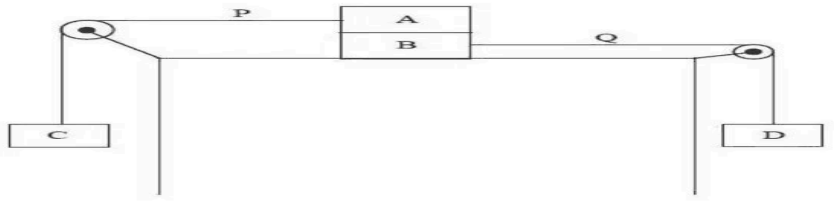
Four blocks A, B, C and D of masses $6\ \text{kg}$, $3\ \text{kg}$, $6\ \text{kg}$ and $1\ \text{kg}$ respectively are connected by light strings passing over frictionless pulleys as shown in the figure. The strings P and Q are horizontal. The coefficient of friction between the horizontal surface and the block B is 0.2 and the blocks A and B move together. If the system is released from rest then the tension in the string Q is (Acceleration due to gravity $= 10\ \text{ms}^{-2}$)

*(see the figure above)*

Question Number : 86 Question Id : 18746347726 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Four blocks A, B, C and D of masses 6 kg, 3 kg, 6 kg and 1kg respectively are connected by light strings passing over frictionless pulleys as shown in the figure. The strings P and Q are horizontal. The coefficient of friction between the horizontal surface and the block B is 0.2 and the blocks A and B move together. If the system is released from rest then the tension in the string Q is
(Acceleration due to gravity = 10 $ms^{-2}$)

ద్రవ్యరాశులు వరుసగా 6 kg, 3 kg, 6 kg మరియు 1 kg లు గల A, B, C మరియు D అను నాలుగు దిమ్మెలు తేలికైన దారాలతో ఘర్షణరహిత కప్పీల మీదుగా పటములో చూపినట్లు అమర్చబడినవి. P మరియు Q దారాలు క్షితిజ సమాంతరంగా ఉన్నాయి. క్షితిజ సమాంతర తలానికి, దిమ్మె B కి మధ్య ఘర్షణ గుణకం 0.2 మరియు A, B దిమ్మెలు కలిసి చలించును. వ్యవస్థను నిశ్చలస్థితి నుండి వదిలితే దారము Q లో తన్యత
(గురుత్వ త్వరణము = 10 $ms^{-2}$)




Options :
1. 48 N
2. 24 N
3. 12 N
4. 6 N

(A) 48 N
(B) 24 N
(C) 12 N
(D) 6 N

**Answer: (C)** 12 N · Official APSCHE final key

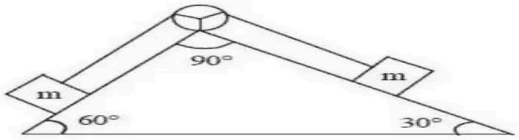
## Q231 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

In the figure shown, the blocks have equal masses. Friction, mass of the string and the mass of the pulley are negligible. The magnitude of the acceleration of the centre of mass of the two blocks is (g - acceleration due to gravity)
*(see the figure above)*

Question Number : 89 Question Id : 1874634729 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the figure shown, the blocks have equal masses. Friction, mass of the string and the mass of the pulley are negligible. The magnitude of the acceleration of the centre of mass of the two blocks is (g - acceleration due to gravity)

పటములో చూపబడిన దిమ్మెల ద్రవ్యరాశులు సమానం. ఘర్షణ, దారము ద్రవ్యరాశి మరియు కప్పీ ద్రవ్యరాశి విస్మరించదగినవి. రెండు దిమ్మెల ద్రవ్యరాశి కేంద్రము యొక్క త్వరణ పరిమాణము (g - గురుత్వ త్వరణము)




Options :

1. $\left(\frac{\sqrt{3}-1}{\sqrt{2}}\right)g$
2. $\frac{g}{2}$
3. $(\sqrt{3}-1)g$
4. $\left(\frac{\sqrt{3}-1}{4\sqrt{2}}\right)g$

(A) $\left(\frac{\sqrt{3}-1}{\sqrt{2}}\right)g$

(B) $\frac{g}{2}$

(C) $(\sqrt{3}-1)g$

(D) $\left(\frac{\sqrt{3}-1}{4\sqrt{2}}\right)g$

**Answer: (D)** $\left(\frac{\sqrt{3}-1}{4\sqrt{2}}\right)g$ · Official APSCHE final key

## Q232 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

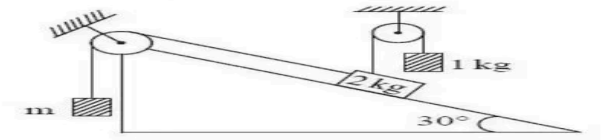
A system containing masses and pulleys connected on an inclined plane is shown in the figure. If the system is in equilibrium then the value of m is

*(see the figure above)*

Question Number : 85 Question Id : 1874634405 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A system containing masses and pulleys connected on an inclined plane is shown in the figure. If the system is in equilibrium then the value of m is

పటంలో చూపినట్లుగా ద్రవ్యరాశులు మరియు కప్పీలు కలపబడిన వ్యవస్థ ఒక వాలుతలంపై ఉంది. ఆ వ్యవస్థ సమతాస్థితిలో ఉంటే m విలువ




Options :
1. 1 kg
2. 0.5 kg
3. 0.75 kg
4. 0.25 kg

(A) 1 kg
(B) 0.5 kg
(C) 0.75 kg
(D) 0.25 kg

**Answer: (B)** 0.5 kg · Official APSCHE final key

## Q233 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

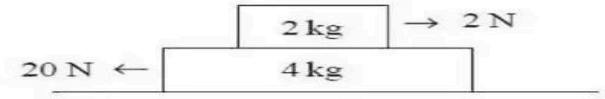
In the arrangement shown in the figure, the coefficient of friction between two blocks is 0.5. The force of friction between the two blocks is (Assume that the 4 kg block is placed on a smooth horizontal surface) (Acceleration due to gravity $= 10\ \mathrm{ms}^{-2}$)

*(see the figure above)*

Question Number : 86 Question Id : 1874634406 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the arrangement shown in the figure, the coefficient of friction between two blocks is 0.5. The force of friction between the two blocks is (Assume that the 4 kg block is placed on a smooth horizontal surface)
(Acceleration due to gravity = 10 $ms^{-2}$)

పటంలో చూపిన రెండు దిమ్మెల మధ్య ఘర్షణ గుణకం 0.5 అయిన ఆ రెండు దిమ్మెల మధ్య ఘర్షణ బలం (4 kg దిమ్మె నునుపైన క్షితిజ సమాంతర తలంపై ఉన్నదనుకొనుము)
(గురుత్వ త్వరణము = 10 $ms^{-2}$)




Options :

1. 8 N
2. 10 N
3. 6 N
4. 4 N

(A) 8 N
(B) 10 N
(C) 6 N
(D) 4 N

**Answer: (A)** 8 N · Official APSCHE final key

## Q234 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

A ball of mass 1 g having a charge of 20 $\mu$C is tied to one end of a string of length 0.9 m can rotate in a vertical plane in a uniform electric field 100 $NC^{-1}$ directed upwards. The minimum horizontal velocity that must be given to the ball at the lowest position so that it completes the vertical circle is ( g = 10 $ms^{-2}$ )

(A) 9 $ms^{-1}$
(B) 18 $ms^{-1}$
(C) 36 $ms^{-1}$
(D) 6 $ms^{-1}$

**Answer: (D)** 6 $ms^{-1}$ · Official APSCHE final key

## Q235 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

A body is acted on by a force given by $F = (15 + 3t^2)$ N. The impulse received by the body during the first 2 seconds is

(A) 28 Ns
(B) 38 Ns
(C) 30 Ns
(D) 19 Ns

**Answer: (B)** 38 Ns · Official APSCHE final key

## Q236 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

A body starts sliding down from the top of an inclined plane inclined at an angle $\theta$ with horizontal. The first one third of the incline is smooth, the next one third has coefficient of friction $\frac{\mu}{2}$ and the last one third has coefficient of friction $\mu$. If the body comes to rest at the bottom of the plane then the value of $\mu$ is

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

**Answer: (D)** $2\tan\theta$ · Official APSCHE final key

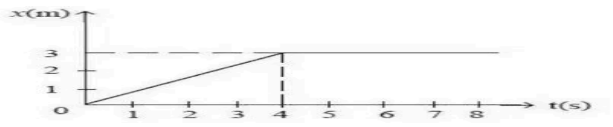
## Q237 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

The position-time ($x$-$t$) graph of a moving body of mass 2 kg is shown in the figure. The impulse on the body at $t = 4$ s is
*(see the figure above)*

Question Number : 85 Question Id : 1874634085 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The position-time ($x$–$t$) graph of a moving body of mass 2 kg is shown in the figure. The impulse on the body at t = 4 s is

గమనంలో ఉన్న 2 kg ద్రవ్యరాశి గల ఒక వస్తువు యొక్క స్థానము-కాలము ($x$–$t$) వక్రము పటములో చూపబడినది. t = 4 s ల వద్ద వస్తువుపై ప్రచోదనం




Options :
1. $1.5\ \text{kg ms}^{-1}$
2. $-1.5\ \text{kg ms}^{-1}$
3. $1\ \text{kg ms}^{-1}$
4. $2\ \text{kg ms}^{-1}$

(A) $1.5\,\mathrm{kg\,ms^{-1}}$

(B) $-1.5\,\mathrm{kg\,ms^{-1}}$

(C) $1\,\mathrm{kg\,ms^{-1}}$

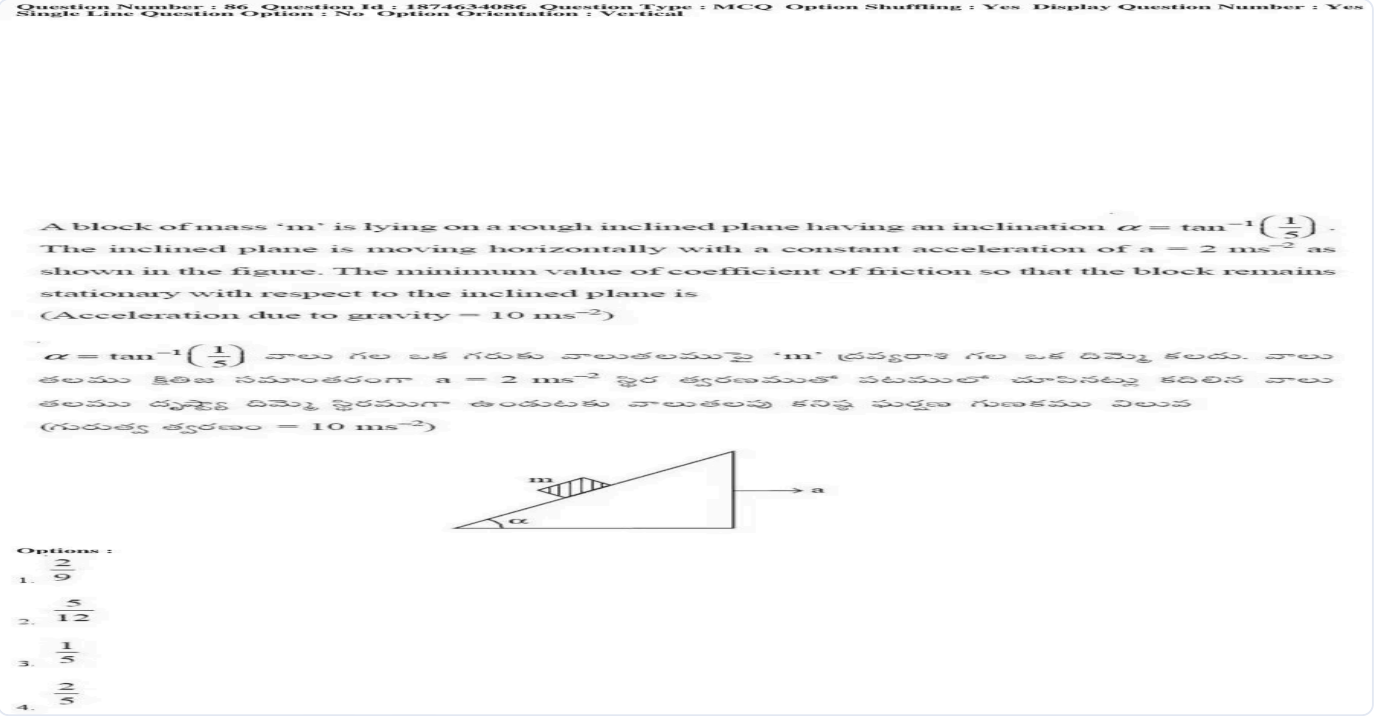
(D) $2\,\mathrm{kg\,ms^{-1}}$

**Answer: (B)** $-1.5\,\mathrm{kg\,ms^{-1}}$ · Official APSCHE final key

## Q238 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

A block of mass 'm' is lying on a rough inclined plane having an inclination $\alpha = \tan^{-1}\left(\frac{1}{5}\right)$. The inclined plane is moving horizontally with a constant acceleration of $a = 2\,\mathrm{ms^{-2}}$ as shown in the figure. The minimum value of coefficient of friction so that the block remains stationary with respect to the inclined plane is (Acceleration due to gravity = $10\,\mathrm{ms^{-2}}$)

*(see the figure above)*




(A) $\frac{2}{9}$

(B) $\frac{5}{12}$

(C) $\frac{1}{5}$

(D) $\frac{2}{5}$

**Answer: (B)** $\frac{5}{12}$ · Official APSCHE final key

## Q239 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

A block of mass 48 kg kept on a smooth horizontal surface is pulled by a rope of length 4 m by a horizontal force of 25 N applied to the other end. If the linear density of the rope is $0.5\,\mathrm{kg\,m^{-1}}$, the force acting on the block is

(A) 24 N
(B) 25 N
(C) 12 N
(D) 13 N

**Answer: (A)** 24 N · Official APSCHE final key

## Q240 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

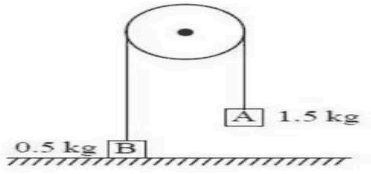
Two blocks A and B of masses 1.5 kg and 0.5 kg respectively are connected by a massless inextensible string passing over a frictionless pulley as shown in the figure. Block A is lifted until block B touches the ground and then block A is released. The initial height of block A is 80 cm when block B just touches the ground. The maximum height reached by block B from the ground after the block A falls on the ground is

*(see the figure above)*

Question Number : 86 Question Id : 1874634246 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Two blocks A and B of masses 1.5 kg and 0.5 kg respectively are connected by a massless inextensible string passing over a frictionless pulley as shown in the figure. Block A is lifted until block B touches the ground and then block A is released. The initial height of block A is 80 cm when block B just touches the ground. The maximum height reached by block B from the ground after the block A falls on the ground is

పటంలో చూపిన విధంగా వరుసగా 1.5 kg మరియు 0.5 kg ద్రవ్యరాశులు గల A మరియు B అనే రెండు దిమ్మెలను ఘర్షణలేని ఒక కప్పి మీదుగా పోవుచున్న తేలికైన సాగదీయబడని దారంతో కలిపారు. దిమ్మె B నేలను తాకేంత వరకు దిమ్మె A ను పైకి లేపి వదిలారు. దిమ్మె B నేలను తాకేటప్పటికి దిమ్మె A యొక్క తొలి ఎత్తు 80 cm దిమ్మె A నేల మీద పడేటప్పటికి దిమ్మె B చేరిన గరిష్ఠ ఎత్తు




Options :
1. 80 cm
2. 120 cm
3. 140 cm
4. 160 cm

(A) 80 cm
(B) 120 cm
(C) 140 cm
(D) 160 cm

**Answer: (B)** 120 cm · Official APSCHE final key

## Q241 AP EAMCET 2019 · 21 Apr · Shift 2 MCQ

A uniform rod of length '$l$' and density '$\rho$' is revolving about a vertical axis passing through its one end. If '$\omega$' is the angular velocity of the rod then the centrifugal force per unit area of the rod is

(A) $\frac{\rho\omega^2 l^2}{4}$
(B) $\frac{\rho\omega^2 l^2}{12}$
(C) $\frac{\rho\omega^2 l^2}{2}$
(D) $\frac{\rho\omega^2 l^2}{8}$

**Answer: (C)** $\frac{\rho\omega^2 l^2}{2}$ · Official APSCHE final key

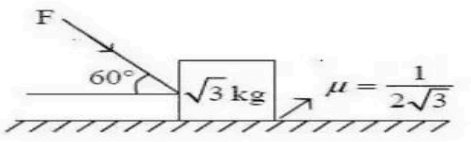
## Q242 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

The maximum value of the applied force F such that the block as shown in the arrangement does not move is
(Acceleration due to gravity $= 10\ \text{ms}^{-2}$)
*(see the figure above)*

Question Number : 85 Question Id : 1874633765 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The maximum value of the applied force F such that the block as shown in the arrangement does not move is
(Acceleration due to gravity $= 10\ \text{ms}^{-2}$)

ఈ అమరికలో చూపిన దిమ్మె కదలకుండా ఉండుటకు ప్రయోగించిన బలం F యొక్క గరిష్ఠ విలువ
(గురుత్వ త్వరణం $= 10\ \text{ms}^{-2}$)




Options :
1. 20 N
2. 15 N
3. 25 N
4. 10 N

(A) 20 N
(B) 15 N
(C) 25 N
(D) 10 N

**Answer: (A)** 20 N · Official APSCHE final key

## Q243 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

A rough inclined plane BCE of height $\left(\frac{25}{6}\right)$ m is kept on a rectangular wooden block ABCD of height 10 m, as shown in the figure. A small block is allowed to slide down from the top E of the inclined plane. The coefficient of kinetic friction between the block and the inclined plane is $\frac{1}{8}$ and the angle of inclination of the inclined plane is $\sin^{-1}(0.6)$. If the small block finally reaches the ground at point F, then DF =

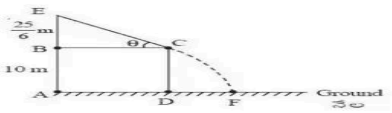
(Acceleration due to gravity $= 10\ \mathrm{ms}^{-2}$)

*(see the figure above)*

Question Number : 86 Question Id : 1874633766 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A rough inclined plane BCE of height $\left(\frac{25}{6}\right)$ m is kept on a rectangular wooden block ABCD of height 10 m, as shown in the figure. A small block is allowed to slide down from the top E of the inclined plane. The coefficient of kinetic friction between the block and the inclined plane is $\frac{1}{8}$ and the angle of inclination of the inclined plane is $\sin^{-1}(0.6)$. If the small block finally reaches the ground at point F, then DF =

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




పటంలో చూపినవిధంగా 10 m ఎత్తుగల ఒక దీర్ఘచతురస్రాకారపు చెక్క దిమ్మె ABCD పై $\left(\frac{25}{6}\right)$ m ఎత్తుగల ఒక గరుకు వాలుతలం BCE ఉంచబడింది. వాలుతలంపై E నుండి ఒక చిన్న దిమ్మెను తలంపై జారనిమ్మని వదిలారు. దిమ్మెకు, వాలుతలానికి మధ్యగల గతిక ఘర్షణ గుణకం $\frac{1}{8}$ మరియు వాలుతలం యొక్క వాలు $\sin^{-1}(0.6)$. చిన్న దిమ్మె నేలను F బిందువు వద్ద తాకితే, DF =

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

Options :

1. $\frac{5}{3}$ m
2. $\frac{10}{3}$ m
3. $\frac{13}{3}$ m
4. $\frac{20}{3}$ m

(A) $\frac{5}{3}$ m

(B) $\frac{10}{3}$ m

(C) $\frac{13}{3}$ m

(D) $\frac{20}{3}$ m

**Answer: (D)** $\frac{20}{3}$ m · Official APSCHE final key

## Q244 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

An inclined plane making an angle $30^\circ$ with the horizontal is placed in a uniform horizontal electric field of $100\ \mathrm{Vm}^{-1}$ as shown in figure. A small block of mass 1 kg and charge 0.01 C is allowed to slide down from rest from a height h = 1 m. If the coefficient of friction is 0.2, then the acceleration of the block is nearly

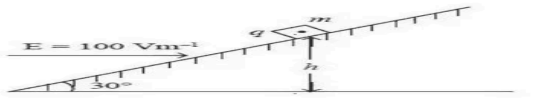
(Acceleration due to gravity = $10\ \mathrm{ms}^{-2}$)

*(see the figure above)*

Question Number : 105 Question Id : 1874633785 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An inclined plane making an angle 30° with the horizontal is placed in a uniform horizontal electric field of 100 $Vm^{-1}$ as shown in figure. A small block of mass 1 kg and charge 0.01 C is allowed to slide down from rest from a height h = 1 m. If the coefficient of friction is 0.2, then the acceleration of the block is nearly
(Acceleration due to gravity = 10 $ms^{-2}$)

క్షితిజ సమాంతరంతో 30° కోణం చేయుచున్న ఒక వాలుతలంను పటంలో చూపినట్లుగా 100 $Vm^{-1}$ ఏకరీతి క్షితిజ సమాంతర విద్యుత్ క్షేత్రంలో ఉంచారు. 1 kg ద్రవ్యరాశి మరియు 0.01 C ఆవేశంగల ఒక చిన్న దిమ్మెను h = 1 m ఎత్తులో నుండి వినామస్థితి నుండి క్రిందకి జారవిడిచారు. వస్తుతల ఘర్షణాంకం 0.2 అయితే దిమ్మె త్వరణం సుమారుగా
(గురుత్వ త్వరణం = 10 $ms^{-2}$)




Options :
1. 1.3 $ms^{-2}$
2. 2.3 $ms^{-2}$
3. 3.3 $ms^{-2}$
4. 4.3 $ms^{-2}$

(A) $1.3\ \text{ms}^{-2}$

(B) $2.3\ \text{ms}^{-2}$

(C) $3.3\ \text{ms}^{-2}$

(D) $4.3\ \text{ms}^{-2}$

**Answer: (B)** $2.3\ \text{ms}^{-2}$ · Official APSCHE final key

## Q245 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

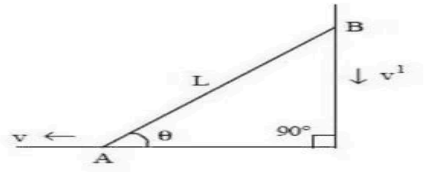
A thin uniform rod of length L is resting against a wall and the floor as shown in the figure. Its lower end A is pulled towards left with a constant velocity 'v'. Then the downward velocity 'v^1' of the other end B when the rod makes an angle $\theta$ with the floor is

*(see the figure above)*

Question Number : 83 Question Id : 1874633923 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A thin uniform rod of length L is resting against a wall and the floor as shown in the figure. Its lower end A is pulled towards left with a constant velocity 'v'. Then the downward velocity '$v^1$' of the other end B when the rod makes an angle $\theta$ with the floor is

L పొడవున్న పలుచని ఏకరీతి కడ్డీ పటంలో చూపిన విధంగా గోడకు ఆనుకొని ఉన్నది. కడ్డీ యొక్క ఒక కొన A ను 'v' ఏకరీతి వేగముతో ఎడమవైపునకు లాగినారు. అయిన కడ్డీ నేలతో '$\theta$' కోణము చేస్తున్నపుడు B కొన క్రిందికి వచ్చు వేగము '$v^1$'




Options :

1. v
2. $v \cos \theta$
3. $v \sin \theta$
4. $v \cot \theta$

(A) $v$

(B) $v \cos \theta$

(C) $v \sin \theta$

(D) $v \cot \theta$

**Answer: (D)** $v \cot \theta$ · Official APSCHE final key

## Q246 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

A force of $(2.6\hat{i} + 1.6\hat{j})$ N acts on a body of mass 2 kg. If the velocity of the body at time $t = 0$ is $(3.6\hat{i} - 4.8\hat{j})$ $ms^{-1}$, the time at which the body will just have a velocity along X - axis only is

(A) 1 s

(B) 2 s

(C) 3 s

(D) 6 s

**Answer: (D)** 6 s · Official APSCHE final key

## Q247 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

The force required to move a body up a rough inclined plane is double the force required to prevent the body from sliding down the plane. If the angle of inclination of the plane is $60^\circ$, then the coefficient of friction is

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

**Answer: (C)** $\frac{1}{\sqrt{3}}$ · Official APSCHE final key

## Q248 TS EAMCET 2018 · 7 May · Shift 1 MCQ

A child is on a merry-go-round, standing at a distance 2 m from the centre. The coefficient of static friction between the child and the surface of merry-go-round is 0.8. At what maximum angular velocity can the merry-go-round be rotated before the child slips? (Assume $g = 10\ \mathrm{m/s^2}$)

(A) 0.5 rad/s
(B) 1 rad/s
(C) 2 rad/s
(D) 4 rad/s

**Answer: (C)** 2 rad/s · The council's preliminary key

## Q249 TS EAMCET 2018 · 7 May · Shift 1 MCQ

A ball of mass 0.2 kg is thrown from a height of 1 m and with an initial velocity of $\sqrt{10}$ m/sec at an angle of $45^\circ$ with the horizontal. Assuming acceleration due to gravity $g = 10\ \mathrm{m/sec^2}$, the modulus of momentum increment during the total time of motion in kg m/sec, is

(A) $\frac{2+\sqrt{10}}{\sqrt{10}}$
(B) $\frac{1+\sqrt{10}}{\sqrt{5}}$
(C) $\frac{1+\sqrt{5}}{\sqrt{5}}$
(D) $\frac{\sqrt{5}-1}{\sqrt{5}}$

**Answer: (C)** $\frac{1+\sqrt{5}}{\sqrt{5}}$ · The council's preliminary key

## Q250 TS EAMCET 2018 · 5 May · Shift 2 MCQ

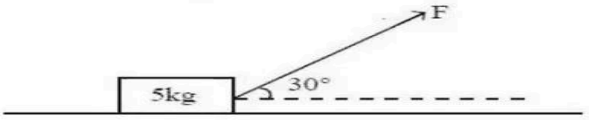
A block of mass $5\ \mathrm{kg}$ is pulled by a force $F$ as shown in the figure. If the coefficient of friction is $0.1$, then the force needed to accelerate the block to $3\ \mathrm{m/s^2}$ to the right is close to

*(see the figure above)*

Question Number : 89 Question Id : 4928632329 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct : 1 Wrong : 0

A block of mass 5 kg is pulled by a force F as shown in the figure. If the coefficient of friction is 0.1, then the force needed to accelerate the block to 3 $m/s^2$ to the right is close to

పటంలో చూపిన విధంగా 5 kg ద్రవ్యరాశిగల ఒక దిమ్మెను F బలంచే లాగినారు. ఘర్షణ గుణకం 0.1 అయితే, దిమ్మెను కుడివైపు 3 $m/s^2$ త్వరణం చెందించడానికి కావలసిన బలము




Options :
1. 12 N
2. 22 N
3. 32 N
4. 42 N

(A) 12 N
(B) 22 N
(C) 32 N
(D) 42 N

**Answer: (B)** 22 N · The council's preliminary key

## Q251 TS EAMCET 2018 · 4 May · Shift 1 MCQ

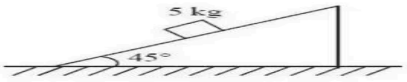
A block of mass 5 kg is kept against an accelerating wedge with a wedge angle of $45^\circ$ to the horizontal. The co-efficient of friction between the block and the wedge is $\mu = 0.4$. What is the minimum absolute value of the acceleration of the wedge to keep the block steady. Assume $g = 10\ m/s^2$

*(see the figure above)*

Question Number : 88 Question Id : 4928631688 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct : 1 Wrong : 0

A block of mass 5 kg is kept against an accelerating wedge with a wedge angle of 45° to the horizontal. The co-efficient of friction between the block and the wedge is $\mu = 0.4$. What is the minimum absolute value of the acceleration of the wedge to keep the block steady. Assume $g = 10\ m/s^2$

క్షితిజసమాంతరముతో 45° చేయు చెక్క త్వరణ గమనానికి వ్యతిరేకంగా 5 kg దిమ్మను చెక్క పై ఉంచారు. చెక్క మరియు దిమ్మల మధ్య ఘర్షణ స్థిరాంకము $\mu = 0.4$ అయితే దిమ్మను నిలకడగా ఉంచాలంటే చెక్క యొక్క కనిష్ఠ త్వరణం యొక్క పరమ విలువ ఎంత? ($g = 10\ m/s^2$ గా భావింపుము)




Options :
1. $\frac{60}{7}\ m/s^2$
2. $\frac{30}{7}\ m/s^2$
3. $\frac{30}{\sqrt{7}}\ m/s^2$
4. $\frac{60}{\sqrt{7}}\ m/s^2$

(A) $\frac{60}{7}\ m/s^2$
(B) $\frac{30}{7}\ m/s^2$
(C) $\frac{30}{\sqrt{7}}\ m/s^2$
(D) $\frac{60}{\sqrt{7}}\ m/s^2$

**Answer: (B)** $\frac{30}{7}\ m/s^2$ · The council's preliminary key

## Q252 TS EAMCET 2018 · 4 May · Shift 1 MCQ

A machine gun can fire 200 bullets/min. If 35 g bullets are fired at a speed of 750 m/s, the average force exerted by the gun on the bullets is,

(A) 87.5 N
(B) 26.2 N
(C) 78.9 N
(D) 110.3 N

**Answer: (A)** 87.5 N · The council's preliminary key

## Q253 TS EAMCET 2018 · 4 May · Shift 2 MCQ

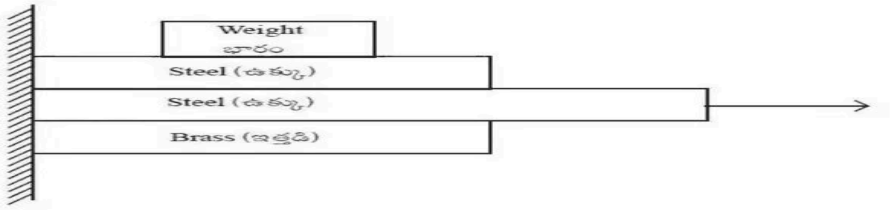
A movable steel plate is placed between fixed steel and brass plates and the stack of plates is subjected to a weight of 100 N as shown in the figure. The coefficient of kinetic friction for steel on steel is 0.57 and for steel on brass is 0.44. Assuming that the entire weight comes onto the stack and that the weight of the plates is negligible in comparison to the applied weight, the force required to move the middle plate in N is

*(see the figure above)*

Question Number : 88 Question Id : 4928631848 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical
Correct : 1 Wrong : 0

A movable steel plate is placed between fixed steel and brass plates and the stack of plates is subjected to a weight of 100 N as shown in the figure. The coefficient of kinetic friction for steel on steel is 0.57 and for steel on brass is 0.44. Assuming that the entire weigh comes onto the stack and that the weight of the plates is negligible in comparison to the applied weight, the force required to move the middle plate in N is

కదలగల ఒక ఉక్కు పలకను స్థిరంగా బిగించిన ఉక్కు మరియు ఇత్తడి పలకల మధ్య అమర్చి ఈ పలకల వ్యవస్థపై పటంలో చూపిన విధంగా 100 N భారాన్ని అపాదించారు. ఉక్కు-ఉక్కు గతిజ ఘర్షణ గుణకము 0.57 మరియు ఉక్కు-ఇత్తడి గతిజ ఘర్షణగుణకము 0.44. మొత్తము భారము పలకల వ్యవస్థపై పనిచేస్తూ, పలకల భారం అనువర్తిత భారంతో పోల్చినపుడు అది విస్మరించబడితే, మధ్యపలకను కదుల్చుటకు కావలసిన బలము న్యూటన్లలో




Options :
1. 13
2. 101
3. 440
4. 570

(A) 13
(B) 101
(C) 440
(D) 570

**Answer: (B) 101** · The council's preliminary key

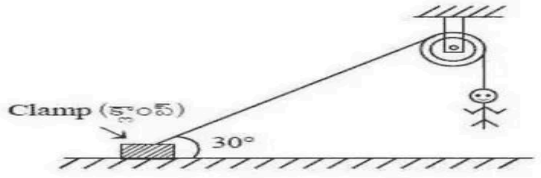
## Q254 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

One end of a light string is fixed to a clamp on the ground and the other end passes over a fixed frictionless pulley as shown in the figure. It makes an angle of $30^\circ$ with the ground. The clamp can tolerate a vertical force of 40 N. If a monkey of mass 5 kg were to climb up the rope then the maximum acceleration in the upward direction with which it can climb safely is ($g = 10\ \mathrm{ms}^{-2}$)
*(see the figure above)*

Question Number : 85 Question Id : 4557344405 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

One end of a light string is fixed to a clamp on the ground and the other end passes over a fixed frictionless pulley as shown in the figure. It makes an angle of 30° with the ground. The clamp can tolerate a vertical force of 40 N. If a monkey of mass 5 kg were to climb up the rope then the maximum acceleration in the upward direction with which it can climb safely is ($g = 10\ ms^{-2}$)

పటములో చూపిన విధంగా ఒక తేలికైన తాడును ఒక చివర నేలతో 30° కోణం చేసే విధంగా ఒక క్లాంప్‌కి బిగించి రెండవ చివరను ఘర్షణ లేని స్థిర కప్పి మీదుగా పోనిచ్చారు. క్లాంప్ 40 N క్షితిజ లంబ బలాన్ని భరిస్తుంది. ద్రవ్యరాశి 5 kg గల ఒక కోతి తాడు సహాయముతో క్షేమంగా పైకి ఎక్కువలెనన్ను ఊర్ధ్వ దిశలో దాని గరిష్ఠ త్వరణము ($g = 10\ ms^{-2}$)




Options :

1. $2\ ms^{-2}$
2. $4\ ms^{-2}$
3. $6\ ms^{-2}$
4. $8\ ms^{-2}$

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

(B) $4\ ms^{-2}$

(C) $6\ ms^{-2}$

(D) $8\ ms^{-2}$

**Answer: (C)** $6\ ms^{-2}$ · The council's preliminary key

## Q255 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

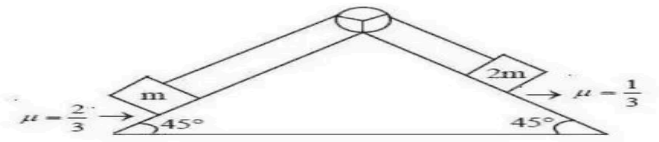
In the arrangement shown in the figure, if the blocks of masses 'm' and '2m' are released from the state of rest, tension in the string is ($\mu$ = coefficient of friction, string is massless and inextensible, pulley is frictionless)

*(see the figure above)*

Question Number : 86 Question Id : 4557344406 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

In the arrangement shown in the figure, if the blocks of masses 'm' and '2m' are released from the state of rest, tension in the string is ($\mu$ = coefficient of friction, string is massless and inextensible, pulley is frictionless)

పటములో చూపబడిన అమరికలో గల 'm' మరియు '2m' ద్రవ్యరాశులు గల దిమ్మెలను విరామ స్థితి నుండి విడుదల చేస్తే, దారములోని తన్యత ($\mu$ = ఘర్షణ గుణకము, ద్రవ్యరాశి లేని మరియు సాగదీయు వీలులేని దారము, ఘర్షణలేని కప్పి).




Options :

1. $mg$
2. $\sqrt{2}\,mg$
3. $\frac{2\sqrt{2}mg}{3}$
4. $\frac{\sqrt{2}mg}{3}$

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

**Options (1) or (3) were accepted. More than one answer was accepted.** · The council's preliminary key

## Q256 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

A stone of mass 2 kg tied to a light inextensible string of length $\frac{5}{3}$ m is whirling in a circular path in a vertical plane. If the ratio of the maximum tension to the minimum tension in the string is 4, then the speed of the stone at the highest point of the circle is _____ ($g = 10\ \text{ms}^{-2}$)

(A) $20\ \text{ms}^{-1}$
(B) $10\sqrt{3}\ \text{ms}^{-1}$
(C) $\sqrt{50}\ \text{ms}^{-1}$
(D) $10\ \text{ms}^{-1}$

**Answer: (C)** $\sqrt{50}\ \text{ms}^{-1}$ · The council's preliminary key

## Q257 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

Two blocks of masses m and 2m kept on a frictionless horizontal surface are connected by a massless string. Two horizontal forces $F_1 = (4.2t)$ N and $F_2 = (7.5t)$ N, where 't' is time in seconds, are acting on the system as shown in the figure. The time at which the tension in the string between the two blocks becomes 10.6 N is _____ s.

*(see the figure above)*

Question Number : 85 Question Id : 4557344565 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Two blocks of masses m and 2m kept on a frictionless horizontal surface are connected by a massless string. Two horizontal forces $F_1 = (4.2t)$ N and $F_2 = (7.5t)$ N, where 't' is time in seconds, are acting on the system as shown in the figure. The time at which the tension in the string between the two blocks becomes 10.6 N is _____ s.

ఒక ఘర్షణలేని క్షితిజ సమాంతర తలంపై ఉంచబడిన m మరియు 2m ద్రవ్యరాశులు గల రెండు దిమ్మెలు తేలికైన దారంతో కలపబడినవి. వ్యవస్థ మీద క్రింది పటంలో చూపిన విధంగా $F_1 = (4.2t)$ N మరియు $F_2 = (7.5t)$ N అనే క్షితిజ సమాంతర బలాలు పనిచేస్తున్నాయి. ఇక్కడ 't' అనునది కాలం సెకండ్లలో. రెండు దిమ్మెల మధ్యగల దారంలో తన్యత 10.6 N అగుటకు పట్టుకాలం _____ s.




Options :
1. 4
2. 3
3. 2
4. 6

(A) 4
(B) 3
(C) 2
(D) 6

**Answer: (C) 2** · The council's preliminary key

## Q258 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

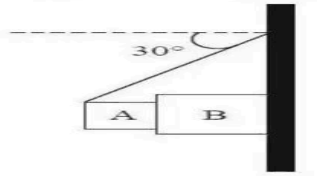
Two blocks A and B of masses $5\ \text{kg}$ and $10\ \text{kg}$ respectively are placed as shown in the figure. The coefficient of friction between all the surfaces is 0.2. Then the acceleration of the block B is _____ ( $g = 10\ \text{ms}^{-2}$)

*(see the figure above)*

Question Number : 86 Question Id : 4557344566 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Two blocks A and B of masses 5 kg and 10 kg respectively are placed as shown in the figure. The coefficient of friction between all the surfaces is 0.2. Then the acceleration of the block B is _____ ($g = 10\ ms^{-2}$)

5 kg మరియు 10 kg ద్రవ్యరాశులు గల A మరియు B అనే రెండు దిమ్మెలను పటంలో చూపినట్లుగా ఉంచారు. అన్ని తలాల మధ్య ఘర్షణ గుణకం 0.2 అయితే B దిమ్మె త్వరణం _____ ($g = 10\ ms^{-2}$)




Options :

1. $2.6\ ms^{-2}$
2. $47\ ms^{-2}$
3. $26\ ms^{-2}$
4. $4.7\ ms^{-2}$

(A) $2.6\ \text{ms}^{-2}$

(B) $47\ \text{ms}^{-2}$

(C) $26\ \text{ms}^{-2}$

(D) $4.7\ \text{ms}^{-2}$

**Answer: (D)** $4.7\ \text{ms}^{-2}$ · The council's preliminary key

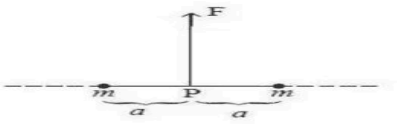
## Q259 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

As shown in the figure, two particles, each of mass 'm' tied at the ends of a light string of length $2a$ are kept on a frictionless horizontal surface. When the mid point (P) of the string is pulled vertically upwards with a small but constant force F, the particles move towards each other on the surface. Magnitude of acceleration of each particle, when the separation between them becomes $2x$ is *(see the figure above)*

Question Number : 86 Question Id : 4557344086 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

As shown in the figure, two particles, each of mass '$m$' tied at the ends of a light string of length $2a$ are kept on a frictionless horizontal surface. When the mid point (P) of the string is pulled vertically upwards with a small but constant force F, the particles move towards each other on the surface. Magnitude of acceleration of each particle, when the separation between them becomes $2x$ is

ఒక్కొక్కటి '$m$' ద్రవ్యరాశిగల రెండు కణములు $2a$ పొడవుగల తేస్సని ద్రవ్యరాశిరహిత దారము రెండు కొనల వద్ద కట్టబడి, సుసమైన క్షితిజ సమాంతర తలంపై పటంలో చూపిన విధంగా ఉంచబడ్డాయి. దారము మధ్య బిందువు (P) ను స్థిరమైన స్వల్ప బలము F తో నిట్టనిలువుగా పైకిలాగినప్పుడు, కణములు ఒక దానికొకటి అభిముఖంగా తలముపై కదిలాయి. వాని మధ్య దూరము $2x$ ఉన్నప్పుడు, ఒక్కో కణము యొక్క త్వరణము




Options :

1. $\frac{F}{2m}\frac{a}{\sqrt{a^2-x^2}}$
2. $\frac{F}{2m}\frac{x}{\sqrt{a^2-x^2}}$
3. $\frac{F}{2m}\frac{x}{a}$
4. $\frac{F}{2m}\frac{\sqrt{a^2-x^2}}{x}$

(A) $\frac{F}{2m}\frac{a}{\sqrt{a^2-x^2}}$

(B) $\frac{F}{2m}\frac{x}{\sqrt{a^2-x^2}}$

(C) $\frac{F}{2m}\frac{x}{a}$

(D) $\frac{F}{2m}\frac{\sqrt{a^2-x^2}}{x}$

**Answer: (B)** $\frac{F}{2m}\frac{x}{\sqrt{a^2-x^2}}$ · The council's preliminary key

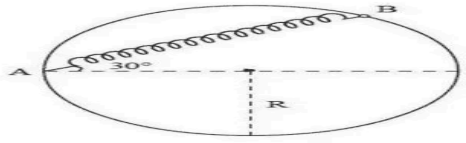
## Q260 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

A bead of mass 100 gram is attached to one end of a spring of natural length L and spring constant $k=\frac{(\sqrt{3}+1)mg}{L}$, where m is the mass of the bead. The other end of the spring is fixed at point A on a smooth vertical ring of radius R as shown in the figure. The normal reaction at B just after it is released to move is ($g=9.8\ \mathrm{ms}^{-2}$) *(see the figure above)*

Question Number : 85 Question Id : 4557344245 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A bead of mass 100 gram is attached to one end of a spring of natural length L and spring constant $k = \frac{(\sqrt{3}+1)mg}{L}$, where m is the mass of the bead. The other end of the spring is fixed at point A on a smooth vertical ring of radius R as shown in the figure. The normal reaction at B just after it is released to move is $(g = 9.8\ ms^{-2})$

L సహజ పొడవు మరియు $k = \frac{(\sqrt{3}+1)mg}{L}$ బల స్థిరాంకం గల స్ప్రింగ్ ఒక చివర 100 గ్రాముల ద్రవ్యరాశి గల్గి B వద్ద ఉంచారు. ఈ స్ప్రింగ్ రెండవ చివర R వ్యాసార్ధం కల్గి నిలువు తలంలో ఉన్న మృదువైన వృత్తాకార కంకణంపై గల స్థిర బిందువు A కు పటంలో చూపినట్లు బిగించబడింది. చలించుటకు దానిని వదిలిన మరుక్షణంలో B వద్ద అభిలంబ ప్రతిచర్య $(g = 9.8\ ms^{-2})$




Options :
1. 1.73 N
2. 2.23 N
3. 2.44 N
4. 2.55 N

(A) 1.73 N

(B) 2.23 N

(C) 2.44 N

(D) 2.55 N

**Answer: (D)** 2.55 N · Checked by our team

## Q261 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

A rocket with an initial mass 'm_0' is going up with a constant acceleration 'a' by exhausting gases with a velocity 'v' relative to the rocket motion, then the mass of the rocket at any instant of time is (Assume that no other forces act on it)

(A) $m = m_0 e^{-\frac{a}{v}t}$

(B) $m = m_0 e^{-\frac{2a}{v}t}$

(C) $m = m_0 e^{-\frac{a}{2v}t}$

(D) $m = m_0 e^{-\frac{a^2}{v^2}t^2}$

**Answer: (A)** $m = m_0 e^{-\frac{a}{v}t}$ · The council's preliminary key

## Q262 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

Sand is to be piled up on a horizontal ground in the form of a regular cone of a fixed base of radius R. Coefficient of static friction between the sand layers is $\mu$. Maximum volume of the sand that can be piled up in the form of cone without slipping on the ground is

(A) $\frac{\mu R^3}{3\pi}$
(B) $\frac{\mu R^3}{3}$
(C) $\frac{\pi R^3}{3\mu}$
(D) $\frac{\mu \pi R^3}{3}$

**Answer: (D)** $\frac{\mu \pi R^3}{3}$ · The council's preliminary key

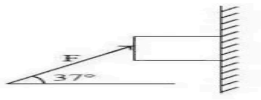
## Q263 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

A block of mass $2\ \text{kg}$ is being pushed against a wall by a force $F = 90\ \text{N}$ as shown in the figure. If the coefficient of friction is $0.25$, then the magnitude of acceleration of the block is _____
$(g = 10\ \text{ms}^{-2})\ \left(\sin 37^\circ = \frac{3}{5}\right)$
*(see the figure above)*

Question Number : 86 Question Id : 4557343766 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A block of mass 2 kg is being pushed against a wall by a force F = 90 N as shown in the figure. If the coefficient of friction is 0.25, then the magnitude of acceleration of the block is _____
$(g = 10\ \text{ms}^{-2})\ \left(\sin 37^\circ = \frac{3}{5}\right)$

2 kg ద్రవ్యరాశి గల ఒక దిమ్మెను 90 N బలంతో ఒక గోడకు వ్యతిరేకంగా పటంలో చూపబడినట్లుగా నెట్టబడుతుంది. గోడకు ఘర్షణ గుణకం 0.25 అయితే ఈ దిమ్మె త్వరణం పరిమాణం
$(g = 10\ \text{ms}^{-2})\ \left(\sin 37^\circ = \frac{3}{5}\right)$




Options :
1. $16\ \text{ms}^{-2}$
2. $8\ \text{ms}^{-2}$
3. $38\ \text{ms}^{-2}$
4. $54\ \text{ms}^{-2}$

(A) $16\ \text{ms}^{-2}$
(B) $8\ \text{ms}^{-2}$
(C) $38\ \text{ms}^{-2}$
(D) $54\ \text{ms}^{-2}$

**Answer: (B)** $8\ \text{ms}^{-2}$ · The council's preliminary key

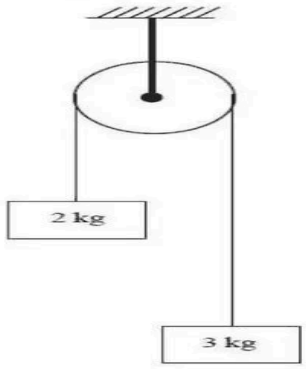
## Q264 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

The system of two masses $2\ \text{kg}$ and $3\ \text{kg}$ shown in the figure is released from rest. The work done on $3\ \text{kg}$ block by the force of gravity during first 2 seconds of its motion is
$(g = 10\ \text{ms}^{-2})$
*(see the figure above)*

Question Number : 88 Question Id : 4557343768 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

The system of two masses 2 kg and 3 kg shown in the figure is released from rest. The work done on 3 kg block by the force of gravity during first 2 seconds of its motion is ($g = 10\ ms^{-2}$)

పటంలో చూపిన 2 kg మరియు 3 kg ద్రవ్యరాశుల వ్యవస్థను విరామస్థితి నుండి వదిలితే, 3 kg దిమ్మెపై గురుత్వాకర్షణ బలం దాని చలనంలో మొదటి 2 సెకనులలో చేసిన పని ($g = 10\ ms^{-2}$)




Options :
1. 120 J
2. 80 J
3. 40 J
4. 30 J

(A) 120 J
(B) 80 J
(C) 40 J
(D) 30 J

**Answer: (A)** 120 J · The council's preliminary key

## Q265 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

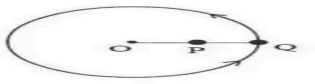
Two spheres P and Q, each of mass 200 g are attached to a string of length one metre as shown in the figure. The string and the spheres are then whirled in a horizontal circle about 'O' at a constant angular speed. The ratio of the tension in the string between P and Q to that of between P and O is (P is at the mid point of line joining O and Q)

*(see the figure above)*

Question Number : 90 Question Id : 4557343770 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Two spheres P and Q, each of mass 200 g are attached to a string of length one metre as shown in the figure. The string and the spheres are then whirled in a horizontal circle about 'O' at a constant angular speed. The ratio of the tension in the string between P and Q to that of between P and O is
(P is at the mid point of line joining O and Q)

200 g ద్రవ్యరాశి గల P మరియు Q అనే రెండు గోళాల్ని ఒక మీటరు పొడవు గల దారానికి పటంలో చూపిన విధంగా కట్టినారు. ఆ దారాన్ని మరియు గోళాల్ని ఒక క్షితిజ సమాంతర వృత్తంలో 'O' ఆధారంగా స్థిర కోణీయ వేగంతో భ్రమిస్తున్న P, Q ల మధ్య దారంలోని తన్యతకు P, O ల మధ్య దారంలోని తన్యతకు గల నిష్పత్తి
(O మరియు Q లను కలిపే రేఖ మధ్య బిందువు వద్ద P కలదు)




Options :
1. $\frac{1}{2}$
2. $\frac{2}{3}$
3. $\frac{3}{2}$
4. $\frac{2}{1}$

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

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

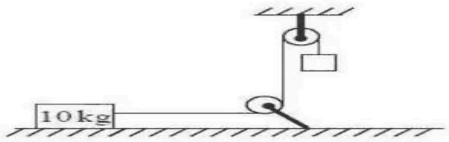
## Q266 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

A block of mass 10 kg is placed on a horizontal frictionless surface and is attached to a cord which passes over two light frictionless pulleys as shown in the figure. The hanging block tied to the other end of the cord is initially at rest 2 m above the horizontal floor. If the hanging block strikes the floor 2 s after the system is released, the weight of the hanging block is _____ ($g = 10\ \mathrm{ms}^{-2}$)
*(see the figure above)*

Question Number : 85 Question Id : 4557343925 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A block of mass 10 kg is placed on a horizontal frictionless surface and is attached to a cord which passes over two light frictionless pulleys as shown in the figure. The hanging block tied to the other end of the cord is initially at rest 2 m above the horizontal floor. If the hanging block strikes the floor 2 s after the system is released, the weight of the hanging block is _____ ($g = 10\ ms^{-2}$)

10 kg ద్రవ్యరాశి గల ఒక దిమ్మె ఘర్షణలేని క్షితిజ సమాంతర తలంపై ఉన్నది. ఈ దిమ్మె ఘర్షణలేని, తేలికైన రెండు కప్పీల మీదుగా పోవుచున్న తాడు ఒక చివరకు పటంలో చూపినట్లుగా కట్టబడి, తాడు రెండవ చివరను క్షితిజ సమాంతర తలానికి 2 m ఎత్తున నిశ్చల స్థితిలో వ్రేలాడుతున్న మరొక దిమ్మెకు కట్టబడి ఉన్నది. ఈ వ్యవస్థను వదిలిన 2 s తరువాత వ్రేలాడుతున్న దిమ్మె తలాన్ని తాకితే, వ్రేలాడుతున్న దిమ్మె భారం_____ ($g = 10\ ms^{-2}$)




Options :
1. 22.22 N
2. 11.11 N
3. 1.11 N
4. 2.22 N

(A) 22.22 N
(B) 11.11 N
(C) 1.11 N
(D) 2.22 N

**Answer: (B)** 11.11 N · The council's preliminary key

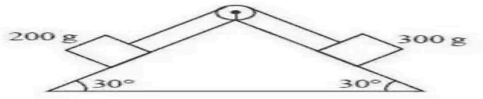
## Q267 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

A double inclined plane as shown in the figure has fixed horizontal base and smooth faces with the same angle of inclination of $30^\circ$. A block of mass 300 g is on one face and is connected by a cord passing over a frictionless pulley to a second block of mass 200 g kept on another face. The acceleration with which the system of the blocks moves is _____ % of acceleration due to gravity.
*(see the figure above)*

Question Number : 86 Question Id : 4557343926 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A double inclined plane as shown in the figure has fixed horizontal base and smooth faces with the same angle of inclination of 30°. A block of mass 300 g is on one face and is connected by a cord passing over a frictionless pulley to a second block of mass 200 g kept on another face. The acceleration with which the system of the blocks moves is _____% of acceleration due to gravity.

స్థిరమైన క్షితిజ సమాంతర భూమి మరియు ఒకే వాలు కోణం 30° గల రెండు నునుపు తలాలు గల ఒక బల్ల పటంలో చూపిన విధంగా ఉంది. ఒక తలంపై ఉన్న 300 g ద్రవ్యరాశి గల ఒక దిమ్మెను రెండవ తలంపై ఉన్న 200 g ద్రవ్యరాశి గల వేరొక దిమ్మెతో ఘర్షణలేని ఒక కప్పి ద్వారా దారంతో కలిపారు. ఈ దిమ్మెల వ్యవస్థ యొక్క త్వరణం, గురుత్వ త్వరణంలో _____ శాతం.




Options :
1. 5
2. 10
3. 15
4. 20

(A) 5
(B) 10
(C) 15
(D) 20

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

## Q268 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

A canon shell fired breaks into two equal parts at its highest point. If one part retraces the path to the canon with kinetic energy $E_1$ and kinetic energy of the second part is $E_2$ then

(A) $E_2 = 15\,E_1$
(B) $E_2 = E_1$
(C) $E_2 = 4\,E_1$
(D) $E_2 = 9\,E_1$

**Answer: (D)** $E_2 = 9\,E_1$ · The council's preliminary key

## Q269 TS EAMCET 2017 · 12 May · Offline MCQ

A wooden box lying at rest on an inclined surface of a wet wood is held at static equilibrium by a constant force $\vec{F}$ applied perpendicular to the incline. If the mass of the box is 1 kg, the angle of inclination is $30^\circ$ and the coefficient of static friction between the box and the inclined plane is 0.2, the minimum magnitude of $\vec{F}$ is (Use $g = 10\,\mathrm{m/s^2}$)

(A) 0 N, as $30^\circ$ is less than angle of repose

(B) $\geq 1$ N

(C) $\geq 3.3$ N

(D) $\geq 16.3$ N

**Answer: (D)** $\geq 16.3$ N · The council's preliminary key

## Q270 TS EAMCET 2017 · 12 May · Offline MCQ

A particle of mass $M$ is moving in a horizontal circle of radius $R$ with uniform speed $v$. When the particle moves from one point to a diametrically opposite point, its

(A) momentum does not change

(B) momentum changes by $2Mv$

(C) kinetic energy changes by $\frac{Mv^2}{4}$

(D) kinetic energy changes by $Mv^2$

**Answer: (B) momentum changes by** $2Mv$ · The council's preliminary key

## Q271 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

A person of 60 Kg mass is in a lift which is coming down such that the man exerts a force of 150 N on the floor of the lift. Then the acceleration of the lift is ($g = 10\ \text{ms}^{-2}$)

(A) $40.0\ \text{ms}^{-2}$

(B) $15.0\ \text{ms}^{-2}$

(C) $22.5\ \text{ms}^{-2}$

(D) $7.5\ \text{ms}^{-2}$

**Answer: (D)** $7.5\ \text{ms}^{-2}$ · The council's preliminary key

## Q272 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

*see figure*

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Question Number : 86 Question Id : 1017174566 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

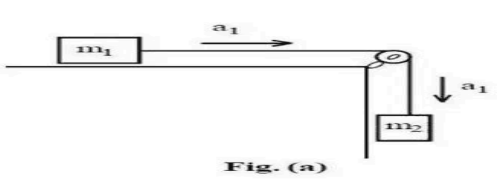


Fig. (a)

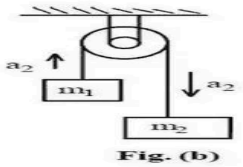


Fig. (b)

The situations are shown in fig (a) & (b), in each case, $m_1 = 3kg$ and $m_2 = 4$ kg. If $a_1$, $a_2$ are the respective accelerations of the blocks in these situations, then the values of $a_1$ and $a_2$ are respectively [ $g = 10\ ms^{-2}$ ]

(a) మరియు (b) పటాలలో చూపబడిన రెండు సందర్భాలలో దిమ్మెల త్వరణాలు $a_1$, $a_2$ అయితే, $m_1 = 3kg$ మరియు $m_2 = 4$ kg గా ఉన్నప్పుడు, $a_1$, $a_2$ ల విలువలు [ $g = 10\ ms^{-2}$ ]

Options :

1. $\frac{10}{7} ms^{-2}$ , $\frac{25}{7} ms^{-2}$
2. $\frac{30}{7} ms^{-2}$ , $\frac{5}{7} ms^{-2}$
3. $\frac{40}{7} ms^{-2}$ , $\frac{10}{7} ms^{-2}$
4. $\frac{20}{7} ms^{-2}$ , $\frac{10}{7} ms^{-2}$

(A) $\frac{10}{7}\ ms^{-2}$ , $\frac{25}{7}\ ms^{-2}$

(B) $\frac{30}{7}\ ms^{-2}$ , $\frac{5}{7}\ ms^{-2}$

(C) $\frac{40}{7}\ ms^{-2}$ , $\frac{10}{7}\ ms^{-2}$

(D) $\frac{20}{7}\ ms^{-2}$ , $\frac{10}{7}\ ms^{-2}$

**Answer: (C)** $\frac{40}{7}\ ms^{-2}$ , $\frac{10}{7}\ ms^{-2}$ · The council's preliminary key

## Q273 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

Two cars are moving on a banked circular path of radius 8 m having angle of banking $45^\circ$. If the coefficients of static friction between the road and the tyres of the two cars are 0.5 and 0.4 respectively, then the ratio of maximum permissible speeds of the cars to avoid slipping is

(A) $\sqrt{7} : \sqrt{5}$

(B) $\sqrt{9} : \sqrt{7}$

(C) $\sqrt{11} : \sqrt{7}$

(D) $\sqrt{13} : \sqrt{11}$

**Answer: (B)** $\sqrt{9} : \sqrt{7}$ · The council's preliminary key

## Q274 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

Two unequal masses 'A' and 'B' moving along a straight line are brought to rest by equal retarding forces. If 'A' takes double the time taken by 'B' to come to rest and 'A' travels $\frac{2}{3}$rd of the distance covered by 'B' before coming to rest, then the ratio of masses of 'A' and 'B' is _____

(A) $1 : 6$

(B) $6 : 1$

(C) $1 : 12$

(D) $12 : 1$

**Answer: (B)** $6 : 1$ · The council's preliminary key

## Q275 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

A packet of weight 'W' dropped from a parachute strikes the ground and comes to rest with retardation equal to twice the acceleration due to gravity. The force exerted on the ground is

(A) W

(B) 2W

(C) 3W

(D) 4W

**Answer: (C)** 3W · The council's preliminary key

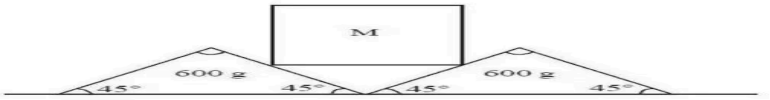
## Q276 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

Two wedges each of mass 600 g are placed next to each other on a rough horizontal surface. The coefficient of static friction between the wedges and the surface is 0.4. A cube of mass 'M' is balanced on the wedges as shown in the figure. If there is no friction between the cube and wedges, the largest mass 'M' of the cube that can be balanced without motion of the wedges is _____ kg

*(see the figure above)*

Question Number : 86 Question Id : 1017174246 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Two wedges each of mass 600 g are placed next to each other on a rough horizontal surface The coefficient of static friction between the wedges and the surface is 0.4. A cube o mass 'M' is balanced on the wedges as shown in the figure. If there is no friction betwee the cube and wedges, the largest mass 'M' of the cube that can be balanced without motio of the wedges is _____ kg




Options :
1. 0.8
2. 0.6
3. 0.3
4. 1.2

(A) 0.8
(B) 0.6
(C) 0.3
(D) 1.2

**Answer: (A)** 0.8 · The council's preliminary key

**Q277** AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

Length of a simple pendulum is 1 m. When its bob is at its lowest point its velocity is 7 $ms^{-1}$. If the bob leaves its circular path at a height 'h' above the centre of the circle, then the value of 'h' is ($g = 10\ ms^{-2}$)

(A) $0.95\ m$
(B) $0.45\ m$
(C) $1.25\ m$
(D) $0.75\ m$

**Answer: (A)** $0.95\ m$ · The council's preliminary key

**Q278** AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

Two weights 2 N and 3 N are suspended from the ends of an inextensible string passing over a fixed frictionless pulley. If the pulley is pulled up with an acceleration equal to the acceleration due to gravity, then the tension in the string is

(A) $2.4\ N$
(B) $5.0\ N$
(C) $4.8\ N$
(D) $6.0\ N$

**Answer: (C)** $4.8\ N$ · The council's preliminary key

**Q279** AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

Two cars of masses $m_1$ and $m_2$, joined back to back by a massless compressed spring are at rest on a horizontal rough road. When the compression of the spring is suddenly removed, the cars move away from each other and come to rest due to friction. If the frictional force is same on them, their stopping times are in the ratio

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(A) $1$
(B) $\frac{m_1}{m_2}$
(C) $\frac{m_2}{m_1}$
(D) $\sqrt{\frac{m_2}{m_1}}$

**Answer: (A)** $1$ · The council's preliminary key

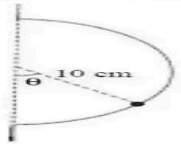
## Q280 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

A small bead of mass 108 g slides without friction along a semicircular wire of radius 10 cm that rotates about a vertical axis at a rate of $10\sqrt{2}\,\mathrm{rad\,s^{-1}}$ as shown in the figure. The value of $\theta$ for which the bead will remain stationary relative to the rotating wire is _____ ($g = 10\ \mathrm{ms^{-2}}$)
*(see the figure above)*

Question Number : 85 Question Id : 1017173765 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A small bead of mass 108 g slides without friction along a semicircular wire of radius 10 cm that rotates about a vertical axis at a rate of $10\sqrt{2}$ rad $s^{-1}$ as shown in the figure. The value of θ for which the bead will remain stationary relative to the rotating wire is _____ ($g = 10\ ms^{-2}$)

108 g ద్రవ్యరాశి గల ఒక చిన్న పూస పటంలో చూపిన విధంగా క్షితిజ లంబ అక్షంపరంగా $10\sqrt{2}$ rad $s^{-1}$ రేటుతో భ్రమణం చేస్తున్న 10 cm వ్యాసార్ధం గల ఒక అర్ధవృత్తాకార తీగ వెంబడి ఘర్షణ లేకుండా జారుచున్నది. భ్రమణం చేస్తున్న తీగ దృష్ట్యా పూస స్థిరంగా ఉండాలంటే, θ విలువ _____ ($g = 10\ ms^{-2}$)




Options :
1. $30°$
2. $45°$
3. $60°$
4. $75°$

(A) $30°$
(B) $45°$
(C) $60°$
(D) $75°$

**Answer: (C)** $60°$ · The council's preliminary key

## Q281 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

A body of mass 5 kg is placed on a rough horizontal surface of coefficient of static friction $\frac{1}{3}$. The least pulling force to be applied on the body at an angle $45°$ with the horizontal to slide it, is _____ ( $g = 10\ \mathrm{ms^{-2}}$)

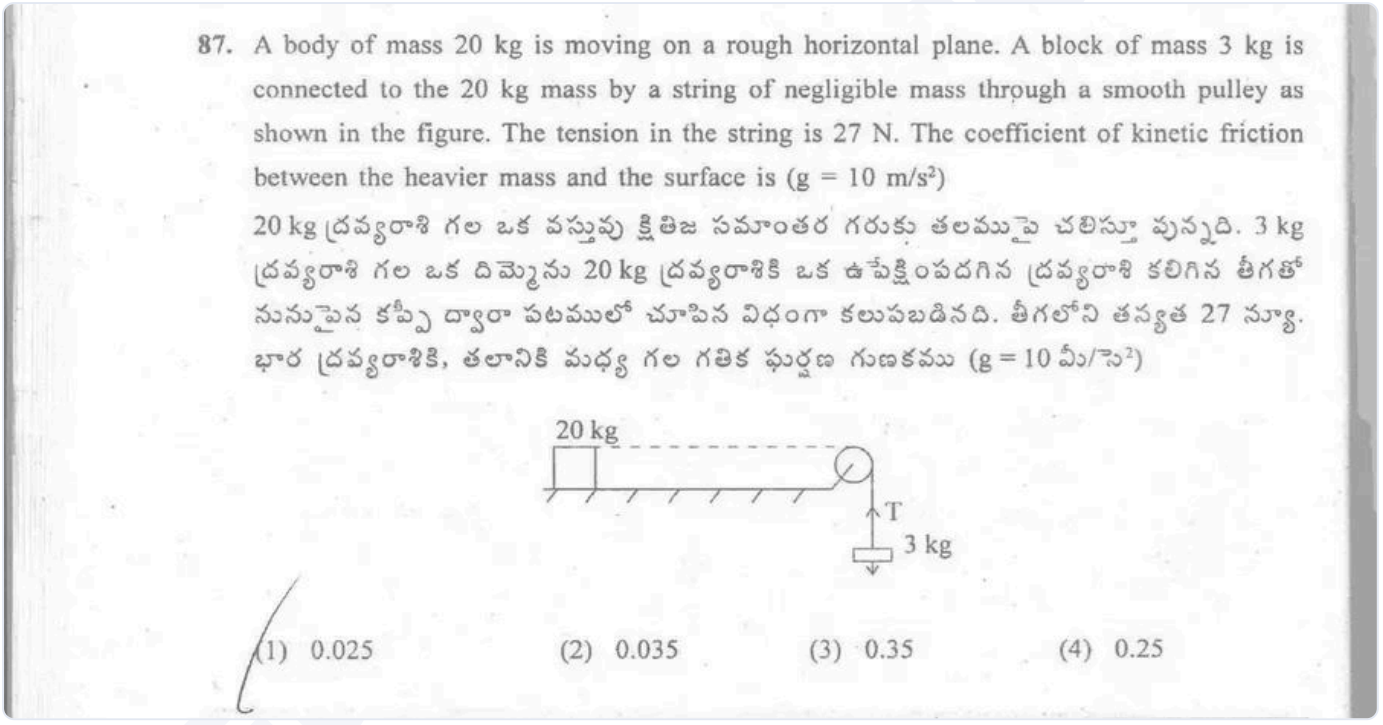
(A) $25\sqrt{2}$ N
(B) $\frac{25}{\sqrt{2}}$ N
(C) $50\sqrt{2}$ N
(D) $\frac{75}{\sqrt{2}}$ N

**Answer: (B)** $\frac{25}{\sqrt{2}}$ N · The council's preliminary key

## Q282 TS EAMCET 2016 · 15 May · Offline MCQ

A body of mass 20 kg is moving on a rough horizontal plane. A block of mass 3 kg is connected to the 20 kg mass by a string of negligible mass through a smooth pulley as shown in the figure. The tension in the string is 27 N. The coefficient of kinetic friction between the heavier mass and the surface is ($g = 10\ \mathrm{m/s^2}$)

*(see the figure above)*


87. A body of mass 20 kg is moving on a rough horizontal plane. A block of mass 3 kg is connected to the 20 kg mass by a string of negligible mass through a smooth pulley as shown in the figure. The tension in the string is 27 N. The coefficient of kinetic friction between the heavier mass and the surface is (g = 10 m/s²)

20 kg ద్రవ్యరాశి గల ఒక వస్తువు క్షితిజ సమాంతర గరుకు తలముపై చలిస్తూ వున్నది. 3 kg ద్రవ్యరాశి గల ఒక దిమ్మెను 20 kg ద్రవ్యరాశికి ఒక ఉపేక్షింపదగిన ద్రవ్యరాశి కలిగిన తీగతో నునుపైన కప్పి ద్వారా పటములో చూపిన విధంగా కలుపబడినది. తీగలోని తన్యత 27 న్యూ. భార ద్రవ్యరాశికి, తలానికి మధ్య గల గతిక ఘర్షణ గుణకము (g = 10 మీ/సె²)

20 kg
T
3 kg

(1) 0.025 (2) 0.035 (3) 0.35 (4) 0.25

(A) 0.025
(B) 0.035
(C) 0.35
(D) 0.25

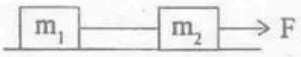
**Answer: (B)** 0.035 · Official TGCHE final key

## Q283 TS EAMCET 2016 · 15 May · Offline MCQ

Two masses $m_1$ and $m_2$ are placed on a smooth horizontal surface and are connected by a string of negligible mass. A horizontal force F is applied on the mass $m_2$ as shown in the figure. The tension in

the string is
*(see the figure above)*

88. Two masses $m_1$ and $m_2$ are placed on a smooth horizontal surface and are connected by a string of negligible mass. A horizontal force F is applied on the mass $m_2$ as shown in the figure. The tension in the string is
$m_1$, $m_2$ ద్రవ్యరాశులు గల రెండు వస్తువులు నున్నని క్షితిజ సమాంతర తలముపై ఉపేక్షింపదగిన ద్రవ్యరాశి గల తీగతో కలుపబడినవి. ఒక క్షితిజ సమాంతరంగా బలము F, $m_2$ ద్రవ్యరాశిపై పటములలో చూపినట్లు ప్రయోగించబడినది. తీగలోని తన్యత




(1) $\left(\frac{m_1}{m_1+m_2}\right)F$ (2) $\frac{m_2F}{m_1+m_2}$
(3) $\left(\frac{m_1}{m_2}\right)F$ (4) $\frac{m_2F}{m_1}$

(A) $\left(\frac{m_1}{m_1+m_2}\right)F$
(B) $\frac{m_2F}{m_1+m_2}$
(C) $\left(\frac{m_1}{m_2}\right)F$
(D) $\frac{m_2F}{m_1}$

**Answer: (A)** $\left(\frac{m_1}{m_1+m_2}\right)F$ · Official TGCHE final key

## Q284 TS EAMCET 2016 · 15 May · Offline MCQ

A simple pendulum of length L carries a bob of mass m. When the bob is at its lowest position, it is given the minimum horizontal speed necessary for it to move in a vertical circle about the point of suspension. When the string is horizontal the net force on the bob is

(A) $\sqrt{10}\,mg$
(B) $\sqrt{5}\,mg$
(C) $4\,mg$
(D) $1\,mg$

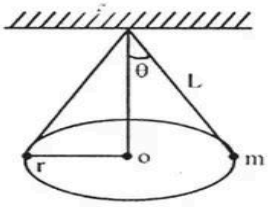
**Answer: (A)** $\sqrt{10}\,mg$ · Official TGCHE final key

## Q285 AP EAMCET 2016 · 29 Apr · Offline MCQ

A particle of mass 'm' is suspended from a ceiling through a string of length 'L'. If the particle moves in a horizontal circle of radius 'r' as shown in the figure, then the speed of the particle is *(see the figure above)*

85. A particle of mass 'm' is suspended from a ceiling through a string of length 'L'. If the particle moves in a horizontal circle of radius 'r' as shown in the figure, then the speed of the particle is

ఒక పైకప్పు నుండి 'L' పొడవు కలిగిన దారంతో 'm' ద్రవ్యరాశి గల ఒక కణంను వ్రేలాడదీసారు. పటంలో చూపిన విధంగా కణం 'r' వ్యాసార్ధం గల క్షితిజ సమాంతర వృత్తం వెంబడి చలిస్తుంటే ఆ కణం వేగం




(1) $r\sqrt{\frac{g}{\sqrt{L^2-r^2}}}$ (2) $g\sqrt{\frac{r}{\sqrt{L^2-r^2}}}$ (3) $r\sqrt{\frac{g}{L^2-r^2}}$ (4) $g\sqrt{\frac{r}{L^2-r^2}}$

(A) $r\sqrt{\frac{g}{\sqrt{L^2-r^2}}}$

(B) $g\sqrt{\frac{r}{\sqrt{L^2-r^2}}}$

(C) $r\sqrt{\frac{g}{L^2-r^2}}$

(D) $g\sqrt{\frac{r}{L^2-r^2}}$

**Answer: (A)** $r\sqrt{\frac{g}{\sqrt{L^2-r^2}}}$ · The council's preliminary key

## Q286 AP EAMCET 2016 · 29 Apr · Offline MCQ

A particle is placed at rest inside a hollow hemisphere of radius 'R'. The co-efficient of friction between the particle and the hemisphere is $\mu = \frac{1}{\sqrt{3}}$. The maximum height upto which the particle can remain stationary is

(A) $\frac{R}{2}$

(B) $\left(1-\frac{\sqrt{3}}{2}\right)R$

(C) $\frac{\sqrt{3}}{2}R$

(D) $\frac{3R}{8}$

**Answer: (B)** $\left(1-\frac{\sqrt{3}}{2}\right)R$ · The council's preliminary key

**Q287** AP EAMCET 2014 · 22 May · Offline MCQ

A bus moving on a level road with a velocity V can be stopped at a distance of x, by the application of a retarding force F. The load on the bus is increased by 25% by boarding the passengers. Now, if the bus is moving with the same speed and if the same retarding force is applied, the distance travelled by the bus before it stops is,

(A) 1.25x
(B) x
(C) 5x
(D) 2.5x

**Answer: (A)** 1.25x · The council's preliminary key

**Q288** AP EAMCET 2014 · 22 May · Offline MCQ

A cannon shell fired breaks into two equal parts at its highest point. One part retraces the path to the cannon with kinetic energy $E_1$ and kinetic energy of the second part is $E_2$. Relation between $E_1$ and $E_2$ is

(A) $E_2 = 15E_1$
(B) $E_2 = E_1$
(C) $E_2 = 4E_1$
(D) $E_2 = 9E_1$

**Answer: (D)** $E_2 = 9E_1$ · The council's preliminary key

**Q289** AP EAMCET 2014 · 22 May · Offline MCQ

The force required to move a body up a rough inclined plane is double the force required to prevent the body from sliding down the plane. The coefficient of friction when the angle of inclination of the plane is $60^\circ$ is

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

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

**Q290** AP EAMCET 2014 · 22 May · Offline MCQ

A mass M kg is suspended by a weightless string. The horizontal force required to hold the mass at $60^\circ$ with the vertical is

(A) $Mg$
(B) $Mg\sqrt{3}$
(C) $Mg(\sqrt{3}+1)$
(D) $\frac{Mg}{\sqrt{3}}$

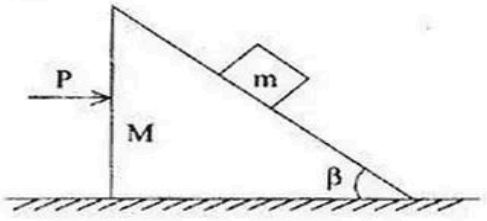
**Answer: (B)** $Mg\sqrt{3}$ · The council's preliminary key

## Q291 AP EAMCET 2013 · 10 May · Offline MCQ

Two wooden blocks of masses M and m are placed on a smooth horizontal surface as shown in figure. If a force P is applied to the system as shown in figure such that the mass m remains stationary with respect to block of mass M, then the magnitude of the force P is
*(see the figure above)*

84. Two wooden blocks of masses M and m are placed on a smooth horizontal surface as shown in figure. If a force P is applied to the system as shown in figure such that the mass m remains stationary with respect to block of mass M, then the magnitude of the force P is

పటములో చూపిన విధముగా M, m ద్రవ్యరాశులు గల చెక్క దిమ్మలు, ఒక నునుపైన క్షితిజ సమాంతర తలముపై వుంచబడినవి. పటములో చూపిన విధముగా P అను బలాన్ని ఆ వ్యవస్థపై ప్రయోగించబడినప్పుడు, 'm' ద్రవ్యరాశి, M ద్రవ్యరాశి పరంగా నిశ్చల స్థితిలోనున్న, P బల పరిమాణము




(1) (M + m) g tan β
(2) g tan β
(3) mg cos β
(4) (M + m) g cosec β

(A) $(M+m)\,g\tan\beta$
(B) $g\tan\beta$
(C) $mg\cos\beta$
(D) $(M+m)\,g\,\mathrm{cosec}\,\beta$

**Answer: (A)** $(M+m)\,g\tan\beta$ · The council's preliminary key

## Q292 AP EAMCET 2013 · 10 May · Offline MCQ

The upper half of an inclined plane with an angle of inclination $\phi$, is smooth while the lower half is rough. A body starting from rest at the top of the inclined plane comes to rest at the bottom of the inclined plane. Then the coefficient of friction for the lower half is

(A) $2\tan\phi$
(B) $\tan\phi$
(C) $2\sin\phi$
(D) $2\cos\phi$

**Answer: (A)** $2\tan\phi$ · The council's preliminary key

**Q293** AP EAMCET 2012 · 12 May · Offline MCQ

In Atwood's machine, two masses 3 kg and 5 kg are connected by a light string which passes over a frictionless pulley. The support of the pulley is attached to the ceiling of a compartment of a train. If the train moves in a horizontal direction with a constant acceleration $8\ \mathrm{ms}^{-2}$, the tension in the string in Newtons is ($g = 10\ \mathrm{ms}^{-2}$)

(A) 3.75
(B) 7.5
(C) 15
(D) 20

**Dropped by APSCHE. Full marks to everyone.** · Official APSCHE final key

**Q294** AP EAMCET 2012 · 12 May · Offline MCQ

When the engine is switched off a vehicle of mass 'M' is moving on a rough horizontal road with momentum P. If the coefficient of friction between the road and tyres of the vehicle is $\mu_k$, the distance travelled by the vehicle before it comes to rest is

(A) $\frac{P^2}{2\mu_k M^2 g}$
(B) $\frac{2\mu_k M^2 g}{P^2}$
(C) $\frac{P^2}{2\mu_k g}$
(D) $\frac{P^2 M^2}{2\mu_k g}$

**Answer: (A)** $\frac{P^2}{2\mu_k M^2 g}$ · Official APSCHE final key

**Q295** AP EAMCET 2011 · 8 May · Offline MCQ

A 1 N pendulum bob is held at an angle $\theta$ from the vertical by a 2 N horizontal force $\vec{F}$ as shown in the figure. The tension in the string supporting the pendulum bob (in Newtons) is :
*(see the figure above)*

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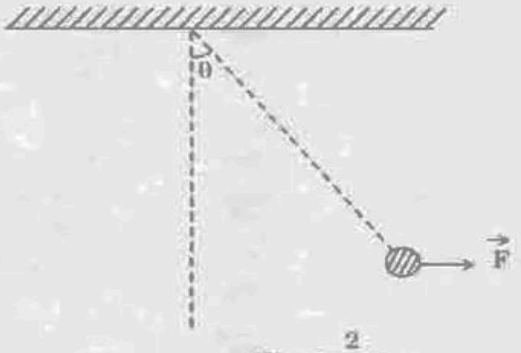
88. A 1 N pendulum bob is held at an angle $\theta$ from the vertical by a 2 N horizontal force $\vec{F}$ as shown in the figure. The tension in the string supporting the pendulum bob (in Newtons) is

ఒక 1 N లోలకపు గుండును, 2 N విలువగల $\vec{F}$ అనే క్షితిజ సమాంతర బలము ద్వారా నిలువుతలముతో $\theta$ కోణము చేయునట్లు (పటములో చూపినట్లు) ఉంచబడినది. లోలకపు తీగలో గల తన్యత (న్యూటన్లలో) :




(1) $\cos\theta$ (2) $\frac{2}{\cos\theta}$

(3) $\sqrt{5}$ (4) 1

(A) $\cos\theta$

(B) $\frac{2}{\cos\theta}$

(C) $\sqrt{5}$

(D) 1

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

## Q296 AP EAMCET 2011 · 8 May · Offline MCQ

The maximum tension a rope can withstand is 60 kg wt. The ratio of maximum acceleration with which two boys of masses 20 kg and 30 kg can climb up the rope at the same time is :

(A) 1 : 2

(B) 2 : 1

(C) 4 : 3

(D) 3 : 2

**Answer: (B)** 2 : 1 · Checked by our team

## Q297 AP EAMCET 2011 · 8 May · Offline MCQ

A uniform chain of length L is lying on the horizontal table. If the coefficient of friction between the chain and the table top is '$\mu$', what is the maximum length of the chain that can hang over the edge of the table without disturbing the rest of the chain on the table ?

(A) $\frac{L}{(1+\mu)}$
(B) $\frac{\mu L}{(1+\mu)}$
(C) $\frac{L}{(1-\mu)}$
(D) $\frac{\mu L}{(1-\mu)}$

**Answer: (B)** $\frac{\mu L}{(1+\mu)}$ · The council's preliminary key

## Q298 AP EAMCET 2010 · 30 May · Offline MCQ

A bomb moving with velocity $(40\hat{i}+50\hat{j}-25\hat{k})$ m/sec explode into two pieces of mass ratio 1 : 4. After explosion the smaller piece moves away with velocity $(200\hat{i}+70\hat{j}+15\hat{k})$ m/sec. The velocity of larger piece after explosion is :

(A) $45\hat{j}-35\hat{k}$
(B) $45\hat{i}-35\hat{j}$
(C) $45\hat{k}-35\hat{j}$
(D) $-35\hat{i}+45\hat{k}$

**Answer: (A)** $45\hat{j}-35\hat{k}$ · Official APSCHE final key

## Q299 AP EAMCET 2010 · 30 May · Offline MCQ

An object takes $n$ times as much time as to slide down a $45^\circ$ rough inclined plane as it takes to slide down a perfectly smooth inclined plane of the same inclination. The coefficient of kinetic friction between the object and the rough incline is given by :

(A) $\left(1-\frac{1}{n^2}\right)$
(B) $\left(\frac{1}{1-n^2}\right)$
(C) $\sqrt{1-\frac{1}{n^2}}$
(D) $\sqrt{1+\frac{1}{n^2}}$

**Answer: (A)** $\left(1-\frac{1}{n^2}\right)$ · Official APSCHE final key

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