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PHYSICS · EAPCET (EAMCET)

Gravitation

Previous Year Questions with answers

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

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What is in this PDF: every Gravitation 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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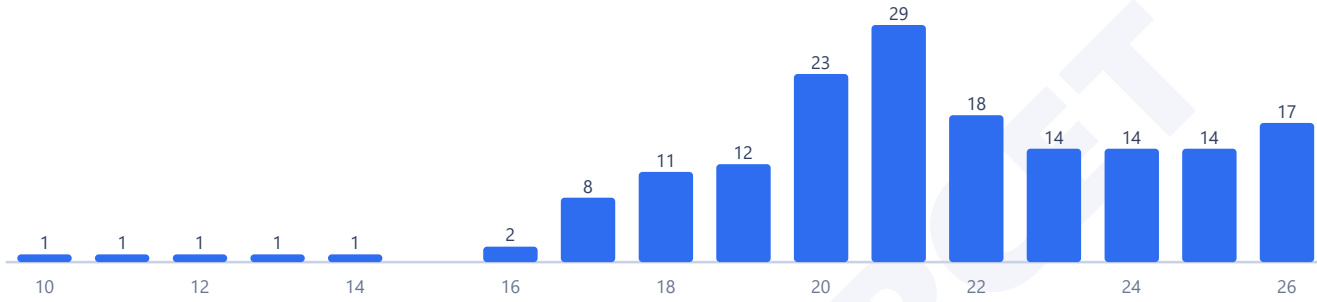
Chapter at a glance

2.5%	167	74 of 77	167 / 0
of Physics questions, 2022–2026	questions, 2010–2026	papers asked it, 2022–2026	MCQ / numerical, 2010–2026

Trend. Steady: 1 questions per paper in 2024–2026 against 1 in 2022–2023.

Questions per year



Counts are the questions we hold: 167 in 143 papers. No question in this chapter was found repeated across papers.

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

Satellites	71
Newton's Law of Gravitation	50
Field & Potential	33
Kepler's Laws	13

How often it comes up

Gravitation provides regular, dependable marks across Intermediate Physics examinations. In the papers we hold from 2022 to 2026, it contributed **77 questions in 77 papers**, averaging exactly **1.0 questions per paper**. During this period, the chapter showed up in 74 of those 77 papers. That places it as the **21st of 28 Physics chapters** by question share, representing 2.5% of all Physics questions asked in those five years.

Looking across the complete archive from 2010 to 2026, our collection records 167 questions from 143 of the 149 papers, maintaining a 1.1 questions per paper average and a 2.8% share of the subject. In the early period from 2010 to 2021, the chapter held a share of 3.1% (90 questions in 72 papers, appearing in 69 papers, 1.3 per paper). Over the last three exam years from 2024 to 2026, it produced 45 questions in 46 papers (appearing in 44 papers, 1.0 per paper, 2.4% share). Compared to the early years, the chapter's share of Physics has fallen, whereas compared to the full recent window it has stayed about the same. Every year since 2022 has featured gravitation problems across our papers.

Between 2022 and 2026, the two states recorded identical question frequencies: AP EAPCET featured 49 questions across 48 papers (appearing in 47 papers, 1.0 per paper, 2.6% share), while TS EAPCET featured 28 questions across 29 papers (appearing in 27 papers, 1.0 per paper, 2.4% share).

Most-asked topics

During the 2022 to 2026 examination period, questions fell into four distinct topics:

- **Satellites**: 41 questions. Across all years from 2010 to 2026, satellite mechanics leads the chapter with 71 questions.
- **Newton's Law of Gravitation**: 22 questions recently, and 50 questions across the full archive.

- **Field & Potential**: 12 questions in the recent window, totalling 33 questions overall.
- **Kepler's Laws**: 2 questions recently, with 13 questions across the complete dataset.

Satellites and universal gravitation together account for over four-fifths of recent questions, making them the primary areas for focused revision.

What the questions look like

Satellite questions concentrate on orbital speed, escape velocity, and total orbital energy. Standard calculations involve finding the external work required to transfer an orbiting satellite from one circular orbit to a higher altitude. Another common scenario compares escape velocity from the surface of Earth to that from an arbitrary planet whose mass and radius scale by given factors. You will also see questions relating escape speed to orbital speed near the surface.

Newton's law questions frequently explore how acceleration due to gravity changes with height and depth. Problems often compare the reduction in effective gravity at altitude h with that at depth d, asking for the depth where the weight loss matches the weight loss at a given height. Other questions examine how Earth's diurnal rotation alters apparent weight at various latitudes through centrifugal reduction.

Field and potential questions investigate self-gravitating solid spheres and spherical shells. Questions ask for the gravitational intensity or potential at points inside a uniform planet, on its surface, and at external distances. Kepler's laws problems usually test the law of periods relating orbital period squared to semimajor axis cubed, or use conservation of angular momentum to link speeds at perihelion and aphelion.

How to practise it

Start by mastering the formulas for acceleration due to gravity at altitude h and depth d. Remember that the linear approximation for altitude holds only when height is negligible compared to planetary radius; for heights comparable to radius R, use the exact inverse-square relation.

Next, study satellite binding energy and orbital dynamics. Remember that kinetic energy equals half the magnitude of potential energy, and total mechanical energy is negative and equal in magnitude to kinetic energy. This energy relationship saves extensive calculation when finding binding energy or transfer work.

Finally, review Kepler's three laws, with special attention to areal velocity invariance resulting from central force torques being zero. Working through past paper questions will ensure you handle percentage changes in gravity and satellite altitude efficiently.

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Q1 AP EAPCET 2026 · 18 May · Shift 1 MCQ

An artificial satellite of mass m revolves around a planet in a circular orbit of radius R under the influence of an attractive central force given by $F\alpha R^{-5/2}$, How does the orbital velocity (V_e) and time period (T) depend on the orbital radius (R)?

(A) $V_e \propto R^{-3/4}, T \propto R^{7/4}$
(B) $V_e \propto R^{-5/4}, T \propto R^{3/2}$
(C) $V_e \propto R^{-1/2}, T \propto R^{5/4}$
(D) $V_e \propto R^{-3/4}, T \propto R^{-7/4}$

Answer: (A) $V_e \propto R^{-3/4}, T \propto R^{7/4}$ · The council's preliminary key

Q2 AP EAPCET 2026 · 18 May · Shift 2 MCQ

If a body is thrown vertically upwards from a height of $0.5\,R$ (R – radius of the earth) with a velocity equal to the escape velocity a body from the surface of the earth, then the velocity of the body when it escapes from the gravitational influence of the earth is (g – acceleration due to gravity on the surface of the earth)

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

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

Q3 AP EAPCET 2026 · 15 May · Shift 1 MCQ

If a body is thrown vertically upwards from the surface of the earth with a speed equal to 75% of the escape speed from the surface of the earth, then the ratio of the maximum height reached by the body and the radius of the earth is

(A) $5:7$
(B) $9:7$
(C) $3:7$
(D) $11:7$

Answer: (B) $9:7$ · The council's preliminary key

Q4 AP EAPCET 2026 · 15 May · Shift 2 MCQ

A planet revolves around the sun in an elliptical orbit. The areal velocity of the planet is $4 \times 10^{16}\ m^2 s^{-1}$. If the maximum distance between the planet and the sun is $4 \times 10^{12}\ m$, then the minimum speed of the planet is

(A) $2\ kms^{-1}$
(B) $8\ kms^{-1}$
(C) $20\ kms^{-1}$
(D) $24\ kms^{-1}$

Answer: (C) $20\ kms^{-1}$ · The council's preliminary key

Q5 AP EAPCET 2026 · 14 May · Shift 1 MCQ

Work required to shift an artificial satellite from an orbit of radius 'r' to an orbit of radius '$2r$' is

(A) $GMm/2r$
(B) $GMm/4r$
(C) $GMm/8r$
(D) zero

Answer: (B) $GMm/4r$ · The council's preliminary key

Q6 AP EAPCET 2026 · 14 May · Shift 2 MCQ

When 'g' is acceleration due to gravity on earth, the gain in potential energy of an object of mass m raised from the surface of earth to a height equal to the radius of earth 'R' is given by

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

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

Q7 AP EAPCET 2026 · 13 May · Shift 1 MCQ

A 1200 kg artificial satellite is in an orbit of radius $2R_E$ about the earth. The energy required to transfer it to an orbit of radius $3R_E$ is ($g = 10\,ms^{-2}$, $R_E = 6400\ km$)

(A) $1.2 \times 10^9\ J$
(B) $6.4 \times 10^9\ J$
(C) $6400 \times 10^3\ J$
(D) $3.2 \times 10^9\ J$

Answer: (B) $6.4 \times 10^9\ J$ · The council's preliminary key

Q8 AP EAPCET 2026 · 13 May · Shift 2 MCQ

The weight of a body decreases by 1% when it is raised to a small height 'h' above the earth's surface. If the same body is taken to a depth 'h' in a mine, then its weight is

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(A) Decreases by 0.5%
(B) Decreases by 2.0%
(C) Increases by 0.5%
(D) Increases by 1.0%

Answer: (A) Decreases by 0.5% · The council's preliminary key

Q9 AP EAPCET 2026 · 12 May · Shift 1 MCQ

If the gravitational force acting on a body due to earth at a height equal to twice the radius of the earth is 30 N, then the mass of the body is (Acceleration due to gravity on the surface of the earth = 10 ms^{-2})

(A) 27 kg
(B) 54 kg
(C) 30 kg
(D) 60 kg

Answer: (A) 27 kg · The council's preliminary key

Q10 AP EAPCET 2026 · 12 May · Shift 2 MCQ

For a planet having uniform density, the Gravitational field inside the planet varies with the distance from the centre as

(A) $1/r$
(B) $1/r^2$
(C) r
(D) Constant

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

Q11 TS EAPCET 2026 · 11 May · Shift 1 MCQ

If two bodies A and B of masses 5 kg and 10 kg are thrown vertically upwards from the surface of the earth with velocities $\sqrt{0.5gR}$ and $\sqrt{0.2gR}$ respectively, then the ratio of maximum heights reached by the bodies A and B is
(R – Radius of the earth)

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

Answer: (C) $3:1$ · The council's preliminary key

Q12 TS EAPCET 2026 · 11 May · Shift 2 MCQ

The fundamental force that operates among all the objects in the universe is

(A) Electromagnetic force
(B) Strong nuclear force
(C) Weak nuclear force
(D) Gravitational force

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

Q13 TS EAPCET 2026 · 11 May · Shift 2 MCQ

If a body of mass 100 kg is thrown vertically upwards from the surface of the earth with a velocity equal to $\frac{2}{3}$ times its escape velocity, then the maximum height reached by the body is
(Radius of the earth = 6400 km)

(A) 3200 km
(B) 5120 km
(C) 8000 km
(D) 12800 km

Answer: (B) 5120 km · The council's preliminary key

Q14 TS EAPCET 2026 · 10 May · Shift 1 MCQ

The energy required to project a body of mass 2 kg so that it escapes from the gravitational influence of the earth is

(Acceleration due to gravity on the surface of the earth $= 10\ \mathrm{ms}^{-2}$ and the radius of the earth $= 6400$ km)

(A) 96×10^6 J
(B) 32×10^6 J
(C) 128×10^6 J
(D) 64×10^6 J

Answer: (C) 128×10^6 J · The council's preliminary key

Q15 TS EAPCET 2026 · 10 May · Shift 2 MCQ

A comet at infinity starts moving towards the earth and passes the earth at a distance of 4R from the center of the earth, where R is the radius of the earth. If escape velocity of a body from the surface of earth is $11.2\ \mathrm{km\,s}^{-1}$, then the maximum velocity of the comet is

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(A) $5.6\ \mathrm{km\,s^{-1}}$
(B) $2.8\ \mathrm{km\,s^{-1}}$
(C) $11.2\ \mathrm{km\,s^{-1}}$
(D) $22.4\ \mathrm{km\,s^{-1}}$

Answer: (A) $5.6\ \mathrm{km\,s^{-1}}$ · The council's preliminary key

Q16 TS EAPCET 2026 · 9 May · Shift 1 MCQ

A body is thrown vertically upwards from the surface of the earth with a velocity K times the orbital velocity of a satellite near the surface of the earth. If the maximum height reached by the body is 200% more than the radius of the earth, then the value of K^2 is

(A) 4.5
(B) 2.5
(C) 1.5
(D) 3.5

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

Q17 TS EAPCET 2026 · 9 May · Shift 2 MCQ

The energy required to transfer a satellite of mass 'm' from an orbit of height 0.5R from the surface of the earth to an orbit of height 2R from the surface of the earth is
(g - acceleration due to gravity on the surface of the earth and R - radius of the earth)

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

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

Q18 AP EAPCET 2025 · 27 May · Shift 1 MCQ

The escape velocity of a body from a planet of mass M and radius R is $14\ \mathrm{km\ s^{-1}}$. The escape velocity of the body from another planet having same mass and diameter 8R (in $\mathrm{km\ s^{-1}}$) is

(A) 7
(B) 10.5
(C) 14
(D) 28

Answer: (A) 7 · The council's preliminary key

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Q19 AP EAPCET 2025 · 26 May · Shift 1 MCQ

The acceleration due to gravity at a height of $(\sqrt{2}-1)R$ from the surface of the earth is (Acceleration due to gravity on the surface of the earth = $10\ \mathrm{m\,s^{-2}}$ and R is radius of the earth)

(A) $2.5\ \mathrm{m\,s^{-2}}$
(B) $7.5\ \mathrm{m\,s^{-2}}$
(C) $5\ \mathrm{m\,s^{-2}}$
(D) $10\ \mathrm{m\,s^{-2}}$

Answer: (C) $5\ \mathrm{m\,s^{-2}}$ · The council's preliminary key

Q20 AP EAPCET 2025 · 26 May · Shift 2 MCQ

The potential energy of a satellite of mass 'm' revolving around the earth at a height of R_e from the surface of the earth is

(R_e - radius of earth; g - acceleration due to gravity)

(A) $-0.5\,mgR_e$
(B) $-mgR_e$
(C) $-2\,mgR_e$
(D) $-4\,mgR_e$

Answer: (A) $-0.5\,mgR_e$ · The council's preliminary key

Q21 AP EAPCET 2025 · 24 May · Shift 1 MCQ

If the escape velocity of a body from the surface of the earth is $11.2\ \mathrm{km\ s^{-1}}$, then the orbital velocity of a satellite in an orbit which is at a height equal to the radius of the earth is

(A) $11.2\ \mathrm{km\ s^{-1}}$
(B) $2.8\ \mathrm{km\ s^{-1}}$
(C) $22.4\ \mathrm{km\ s^{-1}}$
(D) $5.6\ \mathrm{km\ s^{-1}}$

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

Q22 AP EAPCET 2025 · 23 May · Shift 1 MCQ

A mass of $6\times10^{24}\ \mathrm{kg}$ is to be compressed in the form of a solid sphere such that the escape velocity from its surface is $3\times10^{4}\ \mathrm{ms^{-1}}$. The radius of the sphere is (Universal gravitational constant = $6.66\times10^{-11}\ \mathrm{N\,m^2\,kg^{-2}}$)

(A) 483 km
(B) 575 km
(C) 789 km
(D) 888 km

Answer: (D) 888 km · The council's preliminary key

Q23 AP EAPCET 2025 · 22 May · Shift 1 MCQ

Two solid spheres each of radius 'R' made of same material are placed in contact with each other. If the gravitational force acting between them is F, then

(A) $F \alpha R^4$
(B) $F \alpha R^3$
(C) $F \alpha R^2$
(D) $F \alpha R$

Answer: (A) $F \alpha R^4$ · The council's preliminary key

Q24 AP EAPCET 2025 · 22 May · Shift 2 MCQ

Two satellites A and B are revolving around the earth in orbits of heights $1.25R_E$ and $19.25R_E$ from the surface of earth respectively, where R_E is the radius of the earth. The ratio of the orbital speeds of the satellites A and B is

(A) $5:1$
(B) $4:1$
(C) $9:1$
(D) $3:1$

Answer: (D) $3:1$ · The council's preliminary key

Q25 AP EAPCET 2025 · 21 May · Shift 1 MCQ

An infinite number of objects each 1 kg mass are placed on the x-axis on both sides of x = 0 at $\pm 1\,\mathrm{m}$, $\pm 2\,\mathrm{m}$, $\pm 4\,\mathrm{m}$, $\pm 8\,\mathrm{m}$ ... and so on. The magnitude of the resultant gravitational potential (in SI units) at x = 0 is
(G - Universal gravitational constant)

(A) $-G$
(B) $-2G$
(C) $-3G$
(D) $-4G$

Answer: (D) $-4G$ · The council's preliminary key

Q26 AP EAPCET 2025 · 21 May · Shift 2 MCQ

If the angular velocity of a planet about its axis is halved, the distance of the stationary satellite of this planet from the centre of the planet becomes 2^n times the initial distance. Then the value of 'n' is

(A) $\frac{2}{3}$
(B) $\frac{3}{2}$
(C) $\frac{1}{3}$
(D) $\frac{4}{3}$

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

Q27 TS EAPCET 2025 · 4 May · Shift 1 MCQ

A meteor of mass 'm' having a speed 'v' at infinity reaches the surface of the earth with a speed of (v_e is escape speed from the earth's surface)

(A) $\sqrt{2}v_e$
(B) v_e
(C) $2\sqrt{v^2 + {v_e}^2}$
(D) $\sqrt{v^2 + {v_e}^2}$

Answer: (D) $\sqrt{v^2 + {v_e}^2}$ · The council's preliminary key

Q28 TS EAPCET 2025 · 4 May · Shift 2 MCQ

Which of the following is incorrect about the gravitational force between two bodies?

(A) Conservative force
(B) Attractive force
(C) Not a central force
(D) Not a contact force

Answer: (C) Not a central force · The council's preliminary key

Q29 TS EAPCET 2025 · 3 May · Shift 1 MCQ

A body is projected from the earth's surface with a speed $\sqrt{5}$ times the escape speed (V_e). The speed of the body when it escapes from the gravitational influence of the earth is

(A) $2V_e$
(B) V_e
(C) $3V_e$
(D) $5V_e$

Answer: (A) $2V_e$ · The council's preliminary key

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Q30 TS EAPCET 2025 · 3 May · Shift 2 MCQ

If the orbital speed of a body revolving in a circular path near the surface of the earth is $8\ \mathrm{kms}^{-1}$, then the orbital speed of a body revolving around the earth in a circular orbit at height of 19,200 km from the surface of earth is

(Radius of the earth = 6400 km)

(A) $4\ \mathrm{kms}^{-1}$
(B) $6\ \mathrm{kms}^{-1}$
(C) $7.5\ \mathrm{kms}^{-1}$
(D) $9\ \mathrm{kms}^{-1}$

Answer: (A) $4\ \mathrm{kms}^{-1}$ · The council's preliminary key

Q31 TS EAPCET 2025 · 2 May · Shift 1 MCQ

If a body is projected vertically from the surface of the earth with a speed of $8000\ \mathrm{ms}^{-1}$, then the maximum height reached by the body is

(Radius of the earth $= 6400$ km and acceleration due to gravity $= 10\ \mathrm{ms}^{-2}$)

(A) 1600 km
(B) 9600 km
(C) 6400 km
(D) 3200 km

Answer: (C) 6400 km · The council's preliminary key

Q32 AP EAPCET 2024 · 23 May · Shift 1 MCQ

The time period of revolution of a satellite close to planet's surface is 80 minutes. The time period of another satellite which is at a height of 3 times the radius of the planet from surface is

(A) 64 minutes
(B) 640 minutes
(C) 320 minutes
(D) 240 minutes

Answer: (B) 640 minutes · The council's preliminary key

Q33 AP EAPCET 2024 · 22 May · Shift 1 MCQ

A satellite moving round the earth in a circular orbit has kinetic energy 'E'. Then, the minimum amount of energy to be added so that it escapes from the earth

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

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

Q34 AP EAPCET 2024 · 22 May · Shift 2 MCQ

The gravitational potential energy of a body on the surface of the earth is E. If the body is taken from the surface of the earth to a height equal to 150% of the radius of the earth, its gravitational potential energy is

(A) 0.4 E
(B) 0.2 E
(C) 0.6 E
(D) 0.3 E

Answer: (A) 0.4 E · The council's preliminary key

Q35 AP EAPCET 2024 · 21 May · Shift 1 MCQ

If the time period of revolution of a satellite is T, then its kinetic energy is proportional to

(A) T^{-1}
(B) T^{-2}
(C) T^{-3}
(D) $T^{-2/3}$

Answer: (D) $T^{-2/3}$ · The council's preliminary key

Q36 AP EAPCET 2024 · 21 May · Shift 2 MCQ

A particle is projected from the surface of the earth with a velocity equal to twice the escape velocity. When particle is very far from the earth, its speed would be.

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

Answer: (C) $\sqrt{3}\,V_e$ · The council's preliminary key

Q37 AP EAPCET 2024 · 20 May · Shift 1 MCQ

The acceleration due to gravity at a height of 6400 km from the surface of the earth is $2.5\ \mathrm{ms}^{-2}$. The acceleration due to gravity at a height of 12800 km from the surface of the earth is (Radius of the earth = 6400 km)

(A) $1.11\ \mathrm{ms}^{-2}$
(B) $1.5\ \mathrm{ms}^{-2}$
(C) $2.22\ \mathrm{ms}^{-2}$
(D) $1.25\ \mathrm{ms}^{-2}$

Answer: (A) $1.11\ \mathrm{ms}^{-2}$ · The council's preliminary key

Q38 AP EAPCET 2024 · 20 May · Shift 2 MCQ

What is the height from the surface of earth, where acceleration due to gravity will be $\frac{1}{4}$ of that of the earth? ($R_E = 6400$ km)

(A) 6400 km
(B) 3200 km
(C) 1600 km
(D) 640 km

Answer: (A) 6400 km · The council's preliminary key

Q39 AP EAPCET 2024 · 19 May · Shift 2 MCQ

Maximum height reached by a rocket fired with a speed equal to 50% of the escape speed from the surface of the earth is (R – Radius of the earth)

(A) $\frac{R}{2}$
(B) $\frac{16R}{9}$
(C) $\frac{R}{3}$
(D) $\frac{R}{8}$

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

Q40 AP EAPCET 2024 · 18 May · Shift 1 MCQ

Two satellites of masses m and $1.5\,m$ are revolving around the earth with different speeds in two circular orbits of heights $\mathrm{R_E}$ and $2\mathrm{R_E}$ respectively, where $\mathrm{R_E}$ is the radius of the earth. The ratio of the minimum and maximum gravitational forces on the earth due to the two satellites is

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

Options (4) or (2) were accepted. More than one answer was accepted. · The council's preliminary key

Q41 TS EAPCET 2024 · 11 May · Shift 1 MCQ

An object of mass 'm' at a distance of '20R' from the centre of a planet of mass 'M' and radius 'R' has an initial velocity 'u'. The velocity with which the object hits the surface of the planet is

(G-Universal gravitational constant)

(A) $\left[u^2+\frac{19\,\mathrm{GM}}{10\,\mathrm{R}}\right]^{1/2}$

(B) $\left[u^2+\frac{19\,\mathrm{Gm}}{10\,\mathrm{R}}\right]^{1/2}$

(C) $\left[u^2-\frac{19\,\mathrm{GM}}{10\,\mathrm{R}}\right]^{1/2}$

(D) $\left[u^2-\frac{19\,\mathrm{Gm}}{10\,\mathrm{R}}\right]^{1/2}$

Answer: (A) $\left[u^2+\frac{19\,\mathrm{GM}}{10\,\mathrm{R}}\right]^{1/2}$ · The council's preliminary key

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Q42 TS EAPCET 2024 · 10 May · Shift 1 MCQ

Two stars of masses 'M' and '2M' that are at a distance 'd' apart, are revolving one around another. The angular velocity of the system of two stars is (G-Universal gravitational constant)

(A) $\sqrt{\frac{4GM}{d^3}}$

(B) $\sqrt{\frac{2GM}{d^3}}$

(C) $\sqrt{\frac{9GM}{d^3}}$

(D) $\sqrt{\frac{3GM}{d^3}}$

Answer: (D) $\sqrt{\frac{3GM}{d^3}}$ · The council's preliminary key

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Q43 TS EAPCET 2024 · 10 May · Shift 2 MCQ

The ratio of the radii of a planet and the earth is $1:2$, the ratio of their mean densities is $4:1$. If the acceleration due to gravity on the surface of the earth is $9.8\ \mathrm{ms}^{-2}$, then the acceleration due to gravity on the surface of the planet is

(A) $4.9\ \mathrm{ms}^{-2}$

(B) $8.9\ \mathrm{ms}^{-2}$

(C) $29.4\ \mathrm{ms}^{-2}$

(D) $19.6\ \mathrm{ms}^{-2}$

Answer: (D) $19.6\ \mathrm{ms}^{-2}$ · The council's preliminary key

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Q44 TS EAPCET 2024 · 9 May · Shift 1 MCQ

The energy required to take a body from the surface of the earth to a height equal to the radius of the earth is 'W'. The energy required to take this body from the surface of the earth to a height equal to twice the radius of the earth is

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

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

Q45 TS EAPCET 2024 · 9 May · Shift 2 MCQ

The ratio of the accelerations due to gravity at heights 1280 km and 3200 km above the surface of the earth is
(Radius of the earth = 6400 km)

(A) 25:16
(B) 5:2
(C) 1:1
(D) 25:4

Answer: (A) 25:16 · The council's preliminary key

Q46 AP EAPCET 2023 · 19 May · Shift 1 MCQ

The gravitational potential energy of a system of three masses m, 2m and 3m placed at three vertices of equilateral triangle of side 'a' is

(A) $-11\,\frac{Gm}{a}$
(B) $-11\,\frac{Gm^2}{a^2}$
(C) $-11\,\frac{Gm^2}{a}$
(D) $-11\,\frac{Gm}{a^2}$

Answer: (C) $-11\,\frac{Gm^2}{a}$ · The council's preliminary key

Q47 AP EAPCET 2023 · 18 May · Shift 1 MCQ

A satellite is placed in a circular orbit around the earth at an altitude of 1000 km. The time period of the satellite in minutes is approximately

(mass of the earth = 6×10^{24} kg, radius of the earth = 6.4×10^{6} m, G = $6.67 \times 10^{-11}\,\mathrm{Nm^2kg^{-2}}$)

(A) 105
(B) 200
(C) 120
(D) 62

Answer: (A) 105 · The council's preliminary key

Q48 AP EAPCET 2023 · 18 May · Shift 2 MCQ

The vector form of universal law of gravitation

(A) $\vec{F} = G\frac{m_1 m_2}{r}\vec{r}$

(B) $\vec{F} = G\frac{m_1 m_2}{r^3}\hat{r}$

(C) $\vec{F} = G\frac{m_1 m_2}{r^2}\vec{r}$

(D) $\vec{F} = G\frac{m_1 m_2}{r^3}\vec{r}$

Answer: (D) $\vec{F} = G\frac{m_1 m_2}{r^3}\vec{r}$ · The council's preliminary key

Q49 AP EAPCET 2023 · 17 May · Shift 1 MCQ

A uniform solid sphere of mass M and radius 'a' is surrounded by a concentric uniform thin spherical shell of mass 0.5M and radius 1.5a. The gravitational potential energy of a unit mass kept at a distance of 2.5a from the center is

(A) $\frac{-3GM}{5a}$

(B) $\frac{3GM}{5a}$

(C) $\frac{2GM}{5a}$

(D) $\frac{-2GM}{5a}$

Answer: (A) $\frac{-3GM}{5a}$ · The council's preliminary key

Q50 AP EAPCET 2023 · 17 May · Shift 2 MCQ

The statements that are true about acceleration due to gravity, g

A. g is greater at poles.

B. g value decreases with height.

C. g value is same all over the earth.

D. g value is maximum at centre of earth.

(A) A and B

(B) A and D

(C) B and C

(D) C and D

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

Q51 AP EAPCET 2023 · 16 May · Shift 1 MCQ

The time period of a 1500 kg satellite is equal to the time period of rotation of the earth. The altitude of the satellite is nearly

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(A) 42,211 km
(B) 35,840 km
(C) 6,400 km
(D) 13,800 km

Answer: (B) 35,840 km · The council's preliminary key

Q52 AP EAPCET 2023 · 16 May · Shift 2 MCQ

Satellites which give high value data for remote sensing, meteorology and environmental studies are

(A) Geostationary satellites
(B) Polar satellites
(C) Communication satellites
(D) Radio satellites

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

Q53 AP EAPCET 2023 · 15 May · Shift 1 MCQ

The value of acceleration due to gravity at a height of $4R_E$ from surface of earth is (R_E is radius of earth and acceleration due to gravity on the surface of the earth = $10\ \text{ms}^{-2}$)

(A) $0.2\ \text{ms}^{-2}$
(B) $0.3\ \text{ms}^{-2}$
(C) $0.4\ \text{ms}^{-2}$
(D) $3\ \text{ms}^{-2}$

Answer: (C) $0.4\ \text{ms}^{-2}$ · The council's preliminary key

Q54 AP EAPCET 2023 · 15 May · Shift 2 MCQ

The orbital velocity of a body near the surface of a planet 'A' is equal to escape velocity of a body from the planet 'B'. If the masses of planets A and B are same, the ratio of their radii is

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

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

Q55 TS EAMCET 2023 · 14 May · Shift 2 MCQ

A body of mass m is at height R from the surface of the earth where R is the radius of the earth. If the body is taken from here to a height of 3R from the surface of the earth, the increase in the gravitational potential energy of the body is (g is acceleration due to gravity on the surface of the earth)

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(A) $3\,mgR$
(B) $\frac{mgR}{3}$
(C) $4\,mgR$
(D) $\frac{mgR}{4}$

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

Q56 TS EAMCET 2023 · 13 May · Shift 1 MCQ

The percentage increase in the energy for an artificial satellite to shift it from an orbit of radius r to an orbit of radius $\frac{3r}{2}$ is

(A) 66.7
(B) 50
(C) 33.33
(D) 25

Answer: (C) 33.33 · The council's preliminary key

Q57 TS EAMCET 2023 · 13 May · Shift 2 MCQ

The ratio of orbital velocity of a body near to the surface of a planet and escape velocity of a body from the surface of the same planet is

(A) $\sqrt{2} : 1$
(B) $\sqrt{5} : 1$
(C) $1 : \sqrt{2}$
(D) $1 : \sqrt{5}$

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

Q58 TS EAMCET 2023 · 12 May · Shift 1 MCQ

A ring has a mass M and radius R. The distance of the point on its geometric axis from its centre at which the gravitational field is strongest is

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

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

Q59 TS EAMCET 2023 · 12 May · Shift 2 MCQ

The ratio of the radii of two planets is 'r' and the ratio of accelerations due to gravity on the planets is 'x'. Then the ratio of the escape velocities from the planets is

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(A) xr
(B) $\sqrt{\frac{r}{x}}$
(C) $\sqrt{rx}$
(D) $\sqrt{\frac{x}{r}}$

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

Q60 TS EAMCET 2022 · 20 Jul · Shift 1 MCQ

Let the escape speed of an object on the earth's surface be V_0. The object is projected out with speed $5V_0$. The speed of the object far away from the earth will be

(A) $2\sqrt{6}\,V_0$
(B) $4V_0$
(C) $2\sqrt{3}\,V_0$
(D) $3\sqrt{2}\,V_0$

Answer: (A) $2\sqrt{6}\,V_0$ · The council's preliminary key

Q61 TS EAMCET 2022 · 20 Jul · Shift 2 MCQ

Statement I : The force of attraction due to a hollow spherical shell of uniform density on a point mass situated inside it is always positive.
Statement II : The force of attraction between a hollow spherical shell of uniform density and a point mass situated outside is same just as if the entire mass of the shell is at the center of the shell.
Which of the following is correct?

(A) Both statement I and statement II are True
(B) Statement I is true, but statement II is false
(C) Statement II is true, but statement I is false
(D) Both statements, I and II are false

Answer: (C) Statement II is true, but statement I is false · The council's preliminary key

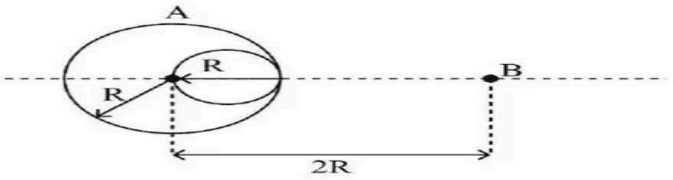
Q62 TS EAMCET 2022 · 19 Jul · Shift 1 MCQ

A uniform sphere A with radius R exerts a force F on a small particle B situated at a distance 2R from the centre of the sphere. A spherical portion of diameter R is cut from the sphere A as shown in the figure. If F' is the new gravitational force between the remaining part of the sphere A and the particle B then the correct relation between F and F'

(see the figure above)

Yes Is Question Mandatory : No Calculator : None Response Time : N.A Think Time : N.A Minimum Instruction Time : 0
Correct Marks : 1 Wrong Marks : 0

A uniform sphere A with radius R exerts a force F on a small particle B situated at a distance 2R from the centre of the sphere. A spherical portion of diameter R is cut from the sphere A as shown in the figure. If F' is the new gravitational force between the remaining part of the sphere A and the particle B then the correct relation between F and F'



Options :

1. $F' = \frac{9}{14}F$
2. $F' = \frac{14}{9}F$
3. $F' = \frac{7}{9}F$
4. $F' = \frac{9}{7}F$

(A) $F' = \frac{9}{14}F$
(B) $F' = \frac{14}{9}F$
(C) $F' = \frac{7}{9}F$
(D) $F' = \frac{9}{7}F$

Answer: (C) $F' = \frac{7}{9}F$ · The council's preliminary key

Q63 TS EAMCET 2022 · 19 Jul · Shift 2 MCQ

Four particles each of mass m are placed at four vertices of a rectangle having side length as $3l_o$ and $4l_o$. The potential energy of the system in $\frac{Gm^2}{l_0}$ is

(A) 7/6
(B) 47/30
(C) 47/60
(D) 7/12

Answer: (B) 47/30 · Checked by our team

Q64 TS EAMCET 2022 · 18 Jul · Shift 1 MCQ

Three particles, each of mass M, situated at the vertices of an equilateral triangle of side length 'l'. The only forces acting on the particles are their mutual gravitational forces. It is desired that each particle moves in a circle while maintaining the original separation 'l'. The initial speed that should be given to each particle is

(A) $\sqrt{\frac{2GM}{l}}$
(B) $\sqrt{\frac{GM}{2l}}$
(C) $\sqrt{\frac{GM}{l}}$
(D) $\sqrt{\frac{3GM}{l}}$

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

Q65 TS EAMCET 2022 · 18 Jul · Shift 2 MCQ

A rocket fired vertically with a speed of 4 km/s from the earth's surface. How far from the earth does the rocket go before returning to the earth?
(Take radius of earth = 6.4×10^6 m and g = 10 m/s^2)

(A) 500.24 km
(B) 914.28 km
(C) 1230.24 km
(D) 1750.28 km

Answer: (B) 914.28 km · The council's preliminary key

Q66 AP EAPCET 2022 · 8 Jul · Shift 1 MCQ

The escape speed of an object on the surface of the earth is V. If the object is thrown out with speed 4V from the surface of the earth, the speed of the object far away from the earth is

(A) $3V$
(B) $\sqrt{15}\,V$
(C) $2.5V$
(D) $\sqrt{8}\,V$

Answer: (B) $\sqrt{15}\,V$ · The council's preliminary key

Q67 AP EAPCET 2022 · 8 Jul · Shift 2 MCQ

The escape velocity of an object from a planet is $16\ \mathrm{kms}^{-1}$. If the escape velocity of the object from another planet having twice the density and three times the radius of the planet is $V\sqrt{2}\ \mathrm{km\,s}^{-1}$, then the value of V is

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(A) 12
(B) 48
(C) 18
(D) 36

Answer: (B) 48 · The council's preliminary key

Q68 AP EAPCET 2022 · 7 Jul · Shift 1 MCQ

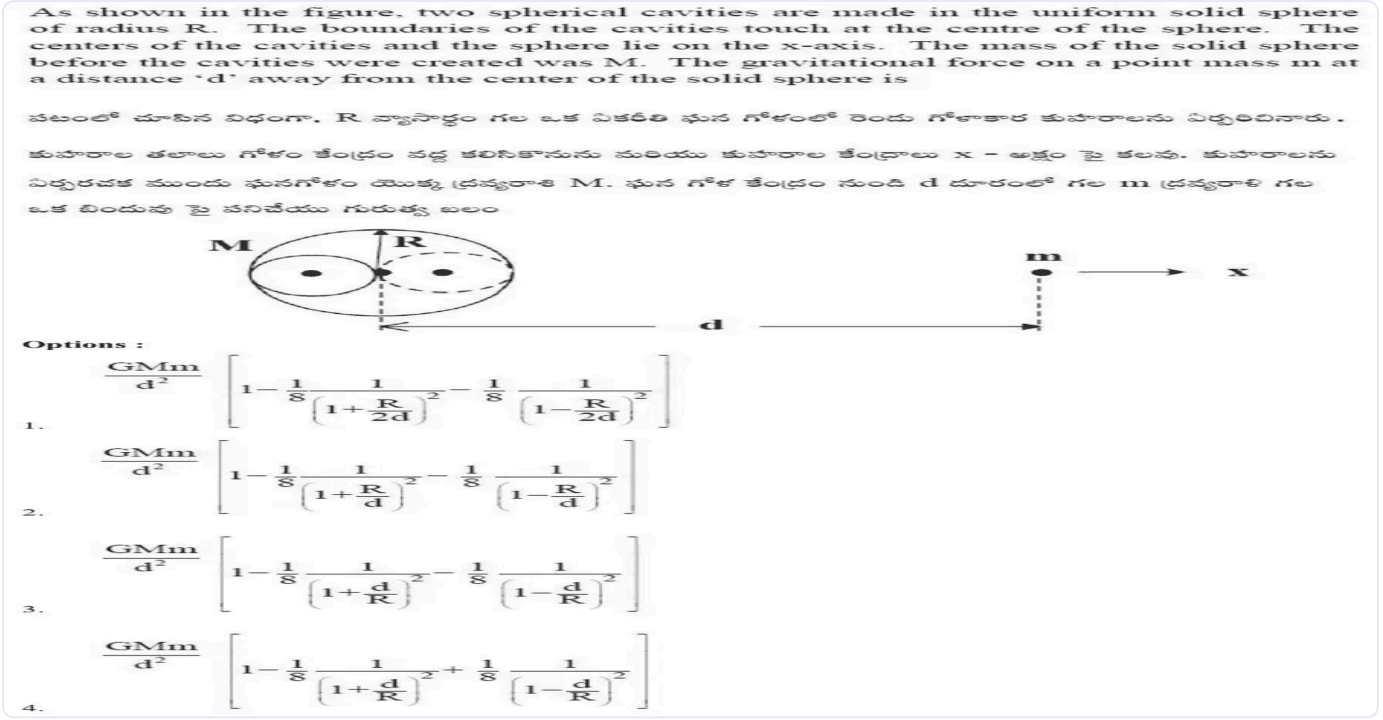
There is a planet which is 8 times massive and 27 times denser than the earth. If g' and g are the accelerations due to gravity on the surfaces of the planet and the earth respectively then

(A) $g' = 8g$
(B) $g' = 27g$
(C) $g' = 18g$
(D) $g' = \frac{9}{4}g$

Answer: (C) $g' = 18g$ · The council's preliminary key

Q69 AP EAPCET 2022 · 7 Jul · Shift 2 MCQ

As shown in the figure, two spherical cavities are made in the uniform solid sphere of radius R. The boundaries of the cavities touch at the centre of the sphere. The centers of the cavities and the sphere lie on the x-axis. The mass of the solid sphere before the cavities were created was M. The gravitational force on a point mass m at a distance 'd' away from the center of the solid sphere is *(see the figure above)*



(A) $\frac{GMm}{d^2}\left[1-\frac{1}{8}\frac{1}{\left(1+\frac{R}{2d}\right)^2}-\frac{1}{8}\frac{1}{\left(1-\frac{R}{2d}\right)^2}\right]$

(B) $\frac{GMm}{d^2}\left[1-\frac{1}{8}\frac{1}{\left(1+\frac{R}{d}\right)^2}-\frac{1}{8}\frac{1}{\left(1-\frac{R}{d}\right)^2}\right]$

(C) $\frac{GMm}{d^2}\left[1-\frac{1}{8}\frac{1}{\left(1+\frac{d}{R}\right)^2}-\frac{1}{8}\frac{1}{\left(1-\frac{d}{R}\right)^2}\right]$

(D) $\frac{GMm}{d^2}\left[1-\frac{1}{8}\frac{1}{\left(1+\frac{d}{R}\right)^2}+\frac{1}{8}\frac{1}{\left(1-\frac{d}{R}\right)^2}\right]$

Answer: (A) $\frac{GMm}{d^2}\left[1-\frac{1}{8}\frac{1}{\left(1+\frac{R}{2d}\right)^2}-\frac{1}{8}\frac{1}{\left(1-\frac{R}{2d}\right)^2}\right]$ · The council's preliminary key

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Q70 AP EAPCET 2022 · 6 Jul · Shift 1 MCQ

The orbital period of a geostationary satellite is

(A) 2 h

(B) 5 h

(C) 24 h

(D) 12 h

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

Q71 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

A satellite is orbiting the earth. It's orbital radius is reduced to half of its initial value then the change in its total energy is

(A) 100%

(B) 75%

(C) 50%

(D) 25%

Answer: (A) 100% · The council's preliminary key

Q72 AP EAPCET 2022 · 6 Jul · Shift 2 MCQ

An object is thrown directly away from the surface of the earth with an initial speed V. The object reaches upto a height of $\frac{4}{5}R_E$ from earth's surface, where R_E is radius of the earth. If the escape velocity of the object is V_E then the value of $\frac{V}{V_E}$ is

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

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

Q73 AP EAPCET 2022 · 5 Jul · Shift 1 MCQ

Statement (A): Two artificial satellites revolving in the same circular orbit have same period of revolution.
Statement (B): The orbital velocity is inversely proportional to the square root of radius of the orbit.
Statement (C): The escape velocity of the body is independent of the altitude of the point of projection.

(A) A, B, C are true
(B) A, B true C false
(C) A, C true B false
(D) B, C true A false

Answer: (B) A, B true C false · The council's preliminary key

Q74 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

When a ball is dropped from a height h it takes t sec to reach the ground. If the same experiment in done on a different planet having the mass 100 times the earth's mass and radius 10 times the earth's radius, then the time it will take to cover the same height in the new planet is

(A) t s
(B) $100\,t$ s
(C) $\frac{t}{100}$ s
(D) $\frac{t}{10}$ s

Answer: (A) t s · The council's preliminary key

Q75 AP EAPCET 2022 · 5 Jul · Shift 2 MCQ

Two planets, A and B orbit around a star such that time period of A is 8 times the time period of B. The ratio of orbital velocities of the planets A and B is

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

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

Q76 AP EAPCET 2022 · 4 Jul · Shift 1 MCQ

A projectile is thrown straight upward from the earth's surface with an initial speed V= $\alpha\, V_E$ where α is a constant and V_E is the escape speed. The projectile travels upto a height 800 km from earth's surface, before it comes to rest. The value of the constant α is
(Radius of the earth = 6400 km)

(A) $\frac{1}{3}$
(B) $\frac{1}{2}$
(C) $\frac{2}{3}$
(D) $\frac{3}{4}$

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

Q77 AP EAPCET 2022 · 4 Jul · Shift 2 MCQ

A uniform solid sphere of radius R produces a gravitational acceleration of a_o on its surface. The distance of the point from the centre of the sphere where the gravitational acceleration becomes $\frac{a_o}{4}$ is

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

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

Q78 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

The escape velocity from the earth is $11.2\ \mathrm{km.s^{-1}}$. The escape velocity from a planet having twice the radius and the same mean density as the earth is:

(A) $22.4\ \mathrm{km.s^{-1}}$
(B) $11.2\ \mathrm{km.s^{-1}}$
(C) $5.6\ \mathrm{km.s^{-1}}$
(D) $15.8\ \mathrm{km.s^{-1}}$

Answer: (A) $22.4\ \mathrm{km.s^{-1}}$ · The council's preliminary key

Q79 AP EAPCET 2021 · 5 Oct · Shift 1 MCQ

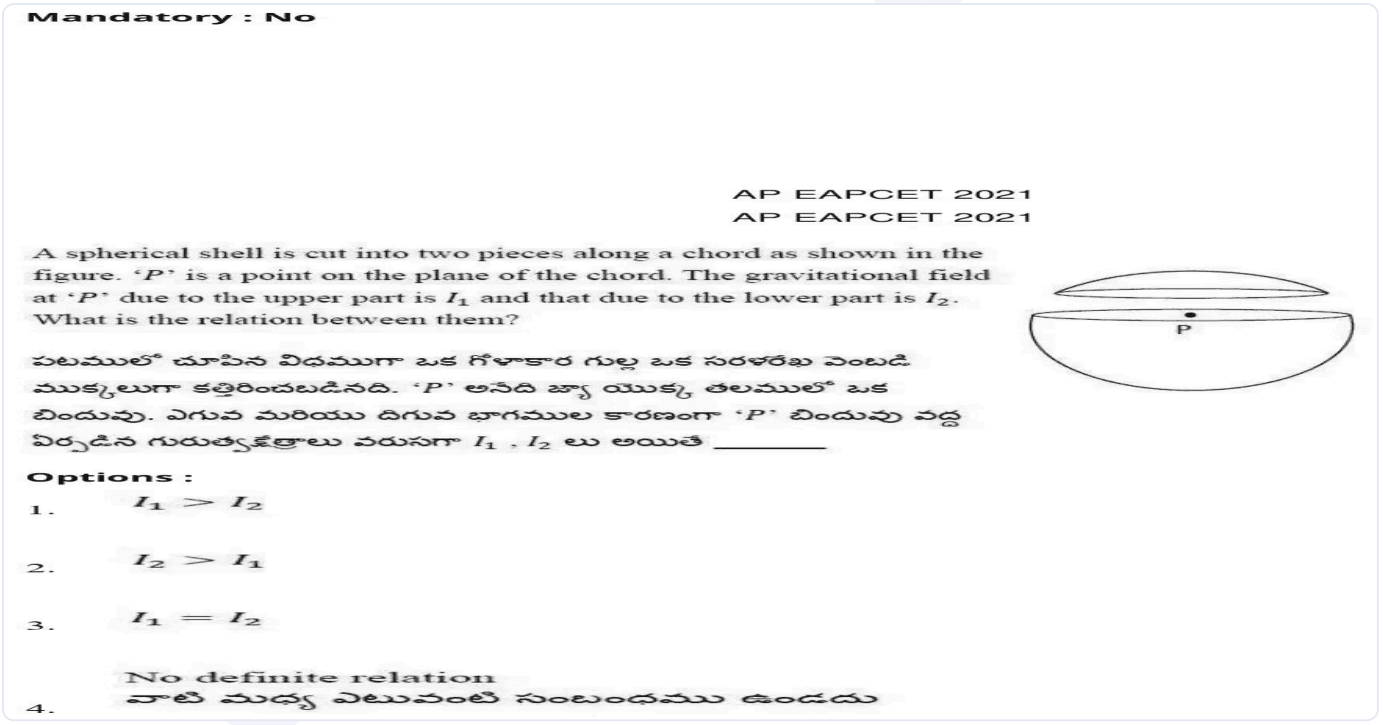
An object is projected upwards with a velocity of $89.6\ \text{km.s}^{-1}$ from the surface of the earth. Velocity of the body when it escapes the gravitational pull of the earth is _____

(A) $11.2\ \text{km.s}^{-1}$
(B) $(\sqrt{126} \times 11.2)\ \text{km.s}^{-1}$
(C) $(\sqrt{63} \times 11.2)\ \text{km.s}^{-1}$
(D) $(\sqrt{8} \times 11.2)\ \text{km.s}^{-1}$

Answer: (C) $(\sqrt{63} \times 11.2)\ \text{km.s}^{-1}$ · The council's preliminary key

Q80 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

A spherical shell is cut into two pieces along a chord as shown in the figure. 'P' is a point on the plane of the chord. The gravitational field at 'P' due to the upper part is I_1 and that due to the lower part is I_2. What is the relation between them?
(see the figure above)



(A) $I_1 > I_2$
(B) $I_2 > I_1$
(C) $I_1 = I_2$
(D) No definite relation

Answer: (C) $I_1 = I_2$ · The council's preliminary key

Q81 AP EAPCET 2021 · 25 Aug · Shift 1 MCQ

Work done in raising a body of mass 'm' from the surface of the earth to a height $\frac{R}{3}$ is _____. (Where R is radius of earth, M is mass of the earth and G is gravitational constant)

(A) $\frac{GMm}{4R}$
(B) $\frac{4GMm}{R}$
(C) $\frac{3GMm}{4R}$
(D) $\frac{GMm}{3R}$

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

Q82 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

An artificial satellite moving in a circular orbit at a distance h from the centre of the earth has a total energy E_0. Then its Potential energy is _____

(A) $-E_0$
(B) $1.5\,E_0$
(C) E_0
(D) $2\,E_0$

Answer: (D) $2\,E_0$ · The council's preliminary key

Q83 AP EAPCET 2021 · 25 Aug · Shift 2 MCQ

Find the angular speed of rotation of the earth so that the apparent-'g' at the equator becomes $(1/6)^{th}$ of its original value. ($R = 6.4 \times 10^6$ m)

(A) $1.3 \times 10^{-6}\ \text{rad.s}^{-1}$
(B) $8.75 \times 10^{-4}\ \text{rad.s}^{-1}$
(C) $1.14 \times 10^{-3}\ \text{rad.s}^{-1}$
(D) $2.6 \times 10^{6}\ \text{rad.s}^{-1}$

Answer: (C) $1.14 \times 10^{-3}\ \text{rad.s}^{-1}$ · The council's preliminary key

Q84 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

A communication satellite of 500 kg revolves around the earth in a circular orbit of radius 4.0×10^7 m in the equatorial plane of the earth from west to east. The magnitude of angular momentum of the satellite is _____

(A) $\approx 0.13 \times 10^{14}\ \text{kg.m}^2\text{.s}^{-1}$
(B) $\approx 1.30 \times 10^{14}\ \text{kg.m}^2\text{.s}^{-1}$
(C) $\approx 0.58 \times 10^{14}\ \text{kg.m}^2\text{.s}^{-1}$
(D) $\approx 2.58 \times 10^{14}\ \text{kg.m}^2\text{.s}^{-1}$

Answer: (C) $\approx 0.58 \times 10^{14}\ \text{kg.m}^2\text{.s}^{-1}$ · The council's preliminary key

Q85 AP EAPCET 2021 · 24 Aug · Shift 1 MCQ

The rotation of the earth (of radius R) about its axis speeds up to a value such that a man at latitude angle 45° feels weightlessness. The duration of a day in such a case is _____

(A) $\pi\left(\sqrt{\frac{R}{g}}\right)$
(B) $\pi\left(\sqrt{\frac{2R}{g}}\right)$
(C) $\frac{\pi}{2}\left(\sqrt{\frac{R}{g}}\right)$
(D) $\pi\left(\sqrt{\frac{g}{R}}\right)$

Answer: (B) $\pi\left(\sqrt{\frac{2R}{g}}\right)$ · The council's preliminary key

Q86 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

If 'R' is the radius of orbit of a satellite, then the kinetic energy of the satellite is _____

(A) $\propto \frac{1}{R}$
(B) $\propto \frac{1}{\sqrt{R}}$
(C) $\propto R$
(D) $\propto \frac{1}{R^{3/2}}$

Answer: (A) $\propto \frac{1}{R}$ · The council's preliminary key

Q87 AP EAPCET 2021 · 24 Aug · Shift 2 MCQ

If 'A' is the areal velocity of a planet of mass 'M', its angular momentum is:

(A) $\frac{M}{A}$
(B) $2MA$
(C) A^2M
(D) AM^2

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

Q88 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

Find the gravitational force between two stones, each of mass $2\ kg$ and separated by a distance $1\ m$ in vacuum.

(A) $0\ N$
(B) $6.675 \times 10^{-5}\ N$
(C) $6.675 \times 10^{-11}\ N$
(D) $2.67 \times 10^{-10}\ N$

Answer: (D) $2.67 \times 10^{-10}\ N$ · The council's preliminary key

Q89 AP EAPCET 2021 · 23 Aug · Shift 1 MCQ

Assertion (A): Angular speed, linear speed as Kinetic energy change with time but angular momentum remains constant for a planet orbiting the sun.
Reason (R): Angular momentum is constant as no torque acts on the planet.

(A) Both A and R are true and R is a correct explanation for A
(B) Both A and R are true but R is not a correct explanation for A
(C) A is true, R is false
(D) A is false, R is false

Answer: (A) Both A and R are true and R is a correct explanation for A · The council's preliminary key

Q90 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

The radius of earth is about 6400 km and that of mars is 3200 km. And mass of the earth is about 10 times mass of mars. An object weighs 200 N on the surface of earth. Then its weight on the surface of mars will be _____

(A) 80 N
(B) 40 N
(C) 20 N
(D) 8 N

Answer: (A) 80 N · The council's preliminary key

Q91 AP EAPCET 2021 · 23 Aug · Shift 2 MCQ

The gravitational field in a region is given by $\vec{I} = 5\hat{i} + 12\hat{j}\ N.kg^{-1}$. The change in the gravitational potential energy of an object of mass 3 kg when it is taken from the origin to a point $(8m, -2m)$ is _____

(A) 1 J
(B) 16 J
(C) 48 J
(D) 3 J

Answer: (C) 48 J · The council's preliminary key

Q92 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

The gravity potential energy is maximum at _____.

(A) Infinity
(B) the earth's surface
(C) the centre of the earth
(D) twice the radius of the earth

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

Q93 AP EAPCET 2021 · 20 Aug · Shift 1 MCQ

A geostationary satellite is taken to a new orbit such that its distance from centre of the earth is doubled. Then find the time period of this satellite in the new orbit.

(A) 24 hrs
(B) 4.8 hrs
(C) $48\sqrt{2}$ hrs
(D) $24\sqrt{2}$ hrs

Answer: (C) $48\sqrt{2}$ hrs · The council's preliminary key

Q94 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

If the earth stops rotating in its orbit about the sun, there will be variation in the weight of our bodies at _____

(A) Equator
(B) 60° latitude
(C) Poles
(D) Nowhere

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

Q95 AP EAPCET 2021 · 20 Aug · Shift 2 MCQ

At what depth below surface of the earth, the acceleration due to gravity will be half its value of that at 1600 km above the surface of the earth?

(A) 4.3×10^6 m
(B) 3.19×10^6 m
(C) 1.59×10^6 m
(D) 5.5×10^6 m

Answer: (A) 4.3×10^6 m · The council's preliminary key

Q96 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

Assertion (A): Two identical trains move in opposite senses in equatorial plane with same speeds relative to the earth's surface. They have equal magnitude of normal reaction.
Reason (R): The trains have different centripetal accelerations due to different speeds.

(A) Both A and R are true and R is a correct explanation for A
(B) Both A and R are true but R is not a correct explanation for A
(C) A is true, R is false
(D) A is false, R is true

Answer: (D) A is false, R is true · The council's preliminary key

Q97 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

A particle is kept on the surface of a uniform sphere of mass $1000\ kg$ and radius $1\ m$. The work done per unit mass against the gravitational force between them is _____ $[G = 6.67 \times 10^{-11}\ \mathrm{N.m^2.Kg^{-2}}]$

(A) $3.35 \times 10^{-10}\ \text{J.kg}^{-1}$
(B) $-3.35 \times 10^{-10}\ \text{J.kg}^{-1}$
(C) $6.67 \times 10^{-8}\ \text{J.kg}^{-1}$
(D) $-3.35 \times 10^{-8}\ \text{J.kg}^{-1}$

Answer: (C) $6.67 \times 10^{-8}\ \text{J.kg}^{-1}$ · The council's preliminary key

Q98 AP EAPCET 2021 · 19 Aug · Shift 1 MCQ

The acceleration due to gravity at a height $(1/20)^{th}$ of the radius of earth above the earth's surface is $9\ \text{m.s}^{-2}$. Its value at an equal depth below the surface of earth is

(A) $9\ \text{m.s}^{-2}$
(B) $9.25\ \text{m.s}^{-2}$
(C) $9.5\ \text{m.s}^{-2}$
(D) $9.8\ \text{m.s}^{-2}$

Answer: (C) $9.5\ \text{m.s}^{-2}$ · The council's preliminary key

Q99 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

The distance through which one has to dig the earth from its surface so as to reach the point where the acceleration due to gravity is reduced by $40\ \%$ of that at the surface of the earth, is _____ (radius of earth is $6400\ \text{km}$)

(A) $2560\ \text{km}$
(B) $3000\ \text{km}$
(C) $3260\ \text{km}$
(D) $1560\ \text{km}$

Answer: (A) $2560\ \text{km}$ · The council's preliminary key

Q100 AP EAPCET 2021 · 19 Aug · Shift 2 MCQ

Infinite number of masses each of $3\ \text{kg}$ are placed along a straight line at the distances of $1\ \text{m}$, $2\ \text{m}$, $4\ \text{m}$, $8\ \text{m}$, ... from a point O on the same line. Ig (sic) G is the universal gravitational constant, then the magnitude of gravitational field intensity at O is _____

(A) $1.0\ G$
(B) $2.0\ G$
(C) $3.0\ G$
(D) $4.0\ G$

Answer: (D) $4.0\ G$ · The council's preliminary key

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Q101 TS EAMCET 2021 · 6 Aug · Shift 1 MCQ

A satellite revolving around the earth at a certain height experiences acceleration due to gravity equal to $\frac{16}{49}g_0$, when g_0 is the acceleration due to gravity on the earth's surface. If R is the radius of earth, then the square of time period of the satellite's revolution is equal to $K\left[\frac{\pi^2R^3}{GM}\right]$. The value of K is:

(A) $\frac{27}{36}R^3$
(B) $\frac{343}{16}R^3$
(C) $\frac{125}{64}R^3$
(D) $\frac{675}{81}R^3$

Answer: (B) $\frac{343}{16}R^3$ · The council's preliminary key

Q102 TS EAMCET 2021 · 6 Aug · Shift 2 MCQ

Match the following

Column-1
A) Potential energy of satellite
B) Total energy of satellite
C) Kinetic energy of satellite
D) Gravitational potential energy of satellite at infinity

Column-2
I) Positive
II) Negative
III) Zero
IV) Infinity

The correct match is

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

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

Q103 TS EAMCET 2021 · 5 Aug · Shift 1 MCQ

Two stars of equal masses M are orbiting in a circle of radius R. Their orbital time period is proportional to

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(A) $R^{3/2}$

(B) R

(C) R^2

(D) $R^{1/2}$

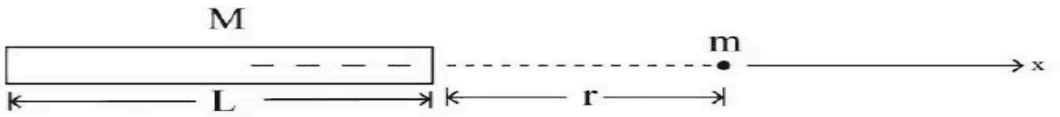
Answer: (A) $R^{3/2}$ · The council's preliminary key

Q104 TS EAMCET 2021 · 5 Aug · Shift 2 MCQ

A point mass 'm' is located at a distance r from a uniform thin rod of mass M and length L as shown in the figure. The magnitude of gravitational force of attraction is

(see the figure above)

A point mass 'm' is located at a distance r from a uniform thin rod of mass M and length L as shown in the figure. The magnitude of gravitational force of attraction is



Options :

1. $\frac{GMm}{r^2}$

2. $\frac{GMm}{(r+L)^2}$

3. $\frac{GMm}{r(r+L)}$

4. $\frac{GMm}{\left(r+\frac{L}{2}\right)^2}$

(A) $\frac{GMm}{r^2}$

(B) $\frac{GMm}{(r+L)^2}$

(C) $\frac{GMm}{r(r+L)}$

(D) $\frac{GMm}{\left(r+\frac{L}{2}\right)^2}$

Answer: (C) $\frac{GMm}{r(r+L)}$ · The council's preliminary key

Q105 TS EAMCET 2021 · 4 Aug · Shift 1 MCQ

What is the change in mass of a body, when taken 64 km below the surface of the earth?
[Take radius of the earth as 6400 km]

(A) Increases by 2%
(B) Remain constant
(C) Increases by 1%
(D) Decrease by 1%

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

Q106 TS EAMCET 2021 · 4 Aug · Shift 2 MCQ

Four identical masses of m are kept at corners of a square. If the gravitational force exerted on one of masses by the other masses is $\left(\frac{2\sqrt{2}+1}{32}\right)\frac{Gm^2}{L^2}$, then the length of the side of the square is

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

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

Q107 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

The weight of a body at earth's surface is w. At a depth half way to the centre of the earth, it will be _____ (assuming of uniform density for earth)

(A) w
(B) $\frac{w}{4}$
(C) $\frac{w}{2}$
(D) $\frac{w}{16}$

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

Q108 AP EAMCET 2020 · 7 Oct · Shift 1 MCQ

A geostationary satellite is taken from one orbit to another orbit, whose distance from the centre of earth is 2 times that of the earlier orbit. The time period in the second orbit is _____ hours

(A) 4.8
(B) $48\sqrt{2}$
(C) 24
(D) $24\sqrt{2}$

Answer: (B) $48\sqrt{2}$ · The council's preliminary key

Q109 AP EAMCET 2020 · 22 Sep · Shift 1 MCQ

The value of acceleration due to gravity 'g' is maximum at

(A) Poles
(B) Centre
(C) Equator
(D) Surface of earth

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

Q110 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

A body of mass m is placed on the earth's surface. It is taken from the earth's surface to a height $h = 3R$,(R is radius of earth). The change in gravitational potential energy of the body is _____

(A) $\left(\frac{2}{3}\right) mgR$
(B) $\left(\frac{3}{4}\right) mgR$
(C) $\left(\frac{1}{2}\right) mgR$
(D) $\left(\frac{1}{4}\right) mgR$

Answer: (B) $\left(\frac{3}{4}\right) mgR$ · The council's preliminary key

Q111 AP EAMCET 2020 · 22 Sep · Shift 2 MCQ

The period of revolution of planet A around the sun is 8 times that of B. The distance of A from sun is how many times greater than that of B from the sun?

(A) 2
(B) 3
(C) 4
(D) 5

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

Q112 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

A point mass of $10\ \text{kg}$ is placed at the centre of earth. The weight of the point mass is

(A) Zero
(B) $98\ \text{N}$
(C) $49\ \text{N}$
(D) $10\ \text{N}$

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

Q113 AP EAMCET 2020 · 21 Sep · Shift 1 MCQ

A body is projected with a velocity greater than orbital velocity but less than escape velocity. Its path is _____

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(A) circular
(B) elliptical
(C) parabolic
(D) hyperbolic

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

Q114 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

The distance between the centers of moon and earth is D and mass of earth is 81 times the mass of moon. At what distance from the centre of the earth, the gravitational force will be zero?

(A) $\frac{D}{2}$
(B) $\frac{2D}{3}$
(C) $\frac{4D}{3}$
(D) $\frac{9D}{10}$

Answer: (D) $\frac{9D}{10}$ · The council's preliminary key

Q115 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

A ball is dropped from a spacecraft revolving around the earth at a height of $120\,\mathrm{km}$. What will happen to the ball?

(A) It will continue to move with same speed along the original orbit of spacecraft
(B) It will move with the same speed tangentially to the original orbit
(C) It will fall down to the earth gradually
(D) It will go very far in space.

Answer: (A) It will continue to move with same speed along the original orbit of spacecraft · The council's preliminary key

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Q116 AP EAMCET 2020 · 21 Sep · Shift 2 MCQ

Acceleration due to gravity at a height 'h' is equal to that at a depth 'd' below the surface of the earth, if

(A) $d = h$
(B) $2d = h$
(C) $d = 2h$
(D) $3d = h$

Answer: (C) $d = 2h$ · The council's preliminary key

Q117 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

The escape velocity for a planet whose radius is $1.7 \times 10^6\,\mathrm{m}$ and acceleration due to gravity is $1.7\,\mathrm{m.s^{-2}}$ is _____

(A) $1.7\,\mathrm{km.s^{-1}}$
(B) $2.89\,\mathrm{km.s^{-1}}$
(C) $1.7\sqrt{2}\,\mathrm{km.s^{-1}}$
(D) $3.4\,\mathrm{km.s^{-1}}$

Answer: (C) $1.7\sqrt{2}\,\mathrm{km.s^{-1}}$ · The council's preliminary key

Q118 AP EAMCET 2020 · 18 Sep · Shift 1 MCQ

At what height from surface of earth the value of acceleration due to gravity will fall to half that on the surface of the earth?

(A) $2625\,\mathrm{m}$
(B) $2625\,\mathrm{km}$
(C) $2526\,\mathrm{m}$
(D) $2526\,\mathrm{km}$

Answer: (B) $2625\,\mathrm{km}$ · The council's preliminary key

Q119 AP EAMCET 2020 · 18 Sep · Shift 2 MCQ

A body is projected vertically upwards from the surface of a planet of radius R, with a velocity equal to half the escape velocity of that planet. Then, the maximum height attained by the body is

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

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

Q120 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

Acceleration due to gravity _____

(A) increases with altitude
(B) decreases with altitude
(C) is independent of altitude
(D) first decreases and then increases with altitude

Answer: (B) decreases with altitude · The council's preliminary key

Q121 AP EAMCET 2020 · 17 Sep · Shift 1 MCQ

Kepler's second law (law of areas) is nothing but a statement of

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(A) Work energy theory
(B) Conservation of linear momentum
(C) Conservation of angular momentum
(D) Conservation of energy

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

Q122 AP EAMCET 2020 · 17 Sep · Shift 2 MCQ

Using the data given below, find the height at which a communication satellite can reside.
($G = 6.67 \times 10^{-11}$ N.m^2.kg^{-2}, $M = 5.98 \times 10^{24}$ kg, $R = 6.4 \times 10^{6}$ m)

(A) 35850 km
(B) 3585 km
(C) 358.5 km
(D) 35.85 km

Answer: (A) 35850 km · The council's preliminary key

Q123 TS EAMCET 2020 · 14 Sep · Shift 1 MCQ

If the escape velocity on earth is 11.2 km/s, its value for a planet having double the radius and 8 time the mass of earth is

(A) 22.4 km/s
(B) 24.3 km/s
(C) 26.6 km/s
(D) 44.8 km/s

Answer: (A) 22.4 km/s · Official TGCHE final key

Q124 TS EAMCET 2020 · 14 Sep · Shift 2 MCQ

A mass M is split into two parts, m_o and $M - m_o$. These two masses are then separated by a distance D. If the gravitational force between the parts is maximum, then the ratio $\frac{m_o}{M}$ is

(A) 0.2
(B) 0.4
(C) 0.5
(D) 0.6

Answer: (C) 0.5 · Official TGCHE final key

Q125 TS EAMCET 2020 · 11 Sep · Shift 2 MCQ

If the radius of the earth shrinks by 1 %, its mass remaining the same, the acceleration due to gravity on the earth surface would.

(A) Increase by 1 %
(B) remain unchanged
(C) Increase by 2 %
(D) decrease by 9.8 %

Answer: (C) Increase by 2 % · Official TGCHE final key

Q126 TS EAMCET 2020 · 10 Sep · Shift 1 MCQ

Choose the correct statement

(A) acceleration due to gravity increases with increasing altitude
(B) acceleration due to gravity is independent of mass of earth
(C) a geostationary satellite can have a time period less than 24 hours
(D) acceleration due to gravity decreases with increasing depth assuming earth to be a sphere of uniform density

Answer: (D) acceleration due to gravity decreases with increasing depth assuming earth to be a sphere of uniform density · Official TGCHE final key

Q127 TS EAMCET 2020 · 10 Sep · Shift 2 MCQ

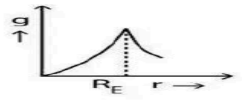
The graph correctly represents the variation of acceleration due to gravity (g) with radial distance from the centre of the earth (radius of the earth = R_E) is

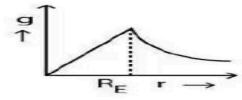
Question Number : 94 Question Id : 719650574 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Is Question Mandatory : No Single Line Question Option : No Option Orientation : Vertical
Correct Marks : 1 Wrong Marks : 0

The graph correctly represents the variation of acceleration due to gravity (g) with radial distance from the centre of the earth (radius of the earth = R_E) is

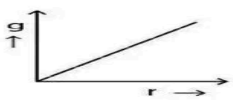
భూకేంద్రం నుండి రేడియల్ దూరంతో పాల్చినప్పుడు గురుత్వాకర్షణ త్వరణం (g) లో మార్పును ఈ క్రింది వానిలో ఏ గ్రాపు సరిగా సూచిస్తుంది (భూ వ్యాసార్ధం = R_E)

Options :

1. 

2. 

3. 

4. 

(A) *see figure*
(B) *see figure*
(C) *see figure*
(D) *see figure*

Answer: (B) · Official TGCHE final key

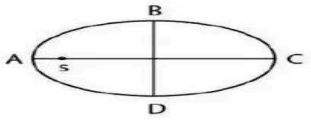
Q128 TS EAMCET 2020 · 9 Sep · Shift 1 MCQ

A planet is revolving around the sun in which of the following is correct statement?
(see the figure above)

Question Number : 94 Question Id : 719650254 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 planet is revolving around the sun in which of the following is correct statement?

సూర్యుని చుట్టూ ఒక గ్రహము పరిభ్రమిస్తున్నట్లయితే, ఈ క్రింది వాటిలో సరియైన వివరణ



Options :

1. The time taken in travelling DAB is less than that for BCD
DAB దూరాన్ని ప్రయాణించటానికి పట్టే కాలము BCD కంటే తక్కువ

2. The time taken in travelling DAB is greater than that for BCD
DAB దూరాన్ని ప్రయాణించటానికి పట్టే కాలము BCD కంటే ఎక్కువ

3. The time taken in travelling CDA is less than that for ABC
CDA దూరాన్ని ప్రయాణించటానికి పట్టే కాలము ABC కంటే తక్కువ

4. The time taken in travelling CDA is greater than that for ABC
CDA దూరాన్ని ప్రయాణించటానికి పట్టే కాలము ABC కంటే ఎక్కువ

(A) The time taken in travelling DAB is less than that for BCD
(B) The time taken in travelling DAB is greater than that for BCD
(C) The time taken in travelling CDA is less than that for ABC
(D) The time taken in travelling CDA is greater than that for ABC

Answer: (A) The time taken in travelling DAB is less than that for BCD · Official TGCHE final key

Q129 TS EAMCET 2020 · 9 Sep · Shift 2 MCQ

Find the acceleration of our galaxy, due to the nearest comparably sized galaxy. The approximate mass of each galaxy is 8×10^{11} solar masses and they are separated by 2 million light-years. Each galaxy has a diameter of 100,000 light years. (Assume 1 light year $\simeq 10^{16}$ m, Gravitational constant G $\simeq 10^{-10} \left(\frac{\mathrm{Nm}^2}{\mathrm{kg}^2}\right)$ and mass of sun = 2.0×10^{30} Kg)

(A) $4 \times 10^{-13}\ m/s^2$
(B) $2 \times 10^{-13}\ m/s^2$
(C) $5 \times 10^{-15}\ m/s^2$
(D) $5 \times 10^{-13}\ m/s^2$

Answer: (A) $4 \times 10^{-13}\ m/s^2$ · Official TGCHE final key

Q130 TS EAMCET 2019 · 6 May · Shift 1 MCQ

A planet of mass m moves around the Sun along an elliptical path with a period of revolution T. During the motion, the planet's maximum and minimum distance from Sun is R and $\frac{R}{3}$ respectively. If $T^2 = \alpha R^3$, then the magnitude of constant α will be

(A) $\frac{10\pi}{9\,Gm}$
(B) $\frac{20\pi^2}{27\,Gm}$
(C) $\frac{32\pi^2}{27\,Gm}$
(D) $\frac{\pi^2}{18\,Gm}$

Answer: (C) $\frac{32\pi^2}{27\,Gm}$ · Official TGCHE final key

Q131 TS EAMCET 2019 · 4 May · Shift 1 MCQ

If a planet of mass 6.4×10^{23} kg can be compressed into a sphere such that the escape velocity from its surface is 8×10^4 m/s, then what should be the radius of the sphere? (Let $G = 6.6 \times 10^{-11}\ \mathrm{Nm^2\,kg^{-2}}$)

(A) 40.4 km
(B) 13.2 km
(C) 20.4 km
(D) 6.8 km

Answer: (B) 13.2 km · Official TGCHE final key

Q132 TS EAMCET 2019 · 4 May · Shift 2 MCQ

If the acceleration due to gravity 'g' doubles and the radius of earth becomes half that of the present value, then the value of Escape velocity is (Assume $g = 10$ m/s^2 and R (radius of earth) $= 6400$ km)

(A) 12 km/s
(B) $16\sqrt{2}$ km/s
(C) $8\sqrt{2}$ km/s
(D) $4\sqrt{2}$ km/s

Answer: (C) $8\sqrt{2}$ km/s · Official TGCHE final key

Q133 TS EAMCET 2019 · 3 May · Shift 1 MCQ

Consider a spherical planet which is rotating about its axis such that the speed of a point on its equator is 'V' and the effective acceleration due to gravity on the equator is $\frac{1}{3}$ of its value at the poles. What is the escape velocity for a particle at the pole of this planet.

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

Answer: (C) $\sqrt{3}\,V$ · Official TGCHE final key

Q134 TS EAMCET 2019 · 3 May · Shift 2 MCQ

If a satellite has to orbit the earth in a circular path every 6 hrs, at what distance from the surface of the earth should the satellite be placed (radius of earth = 6400 km) (Assume $\frac{GM}{4\pi^2} = 8 \times 10^{12}\ \mathrm{Nm^2/kg}$, where G and M are gravitational constant and mass of earth and $10^{1/3} = 2.1$)

(A) 15100 km
(B) 8720 km
(C) 20600 km
(D) 5560 km

Answer: (B) 8720 km · Official TGCHE final key

Q135 AP EAMCET 2019 · 23 Apr · Shift 1 MCQ

The gravitational field in a region is given by $\vec{E} = (5\hat{i} + 12\hat{j})\ \mathrm{Nkg^{-1}}$. If a particle of mass $2\ \mathrm{kg}$ is moved from the origin to the point $(12\ \mathrm{m},\ 15\ \mathrm{m})$ in this region, the change in gravitational potential energy is

(A) $-450\ \mathrm{J}$
(B) $-480\ \mathrm{J}$
(C) $-240\ \mathrm{J}$
(D) $-500\ \mathrm{J}$

Answer: (B) $-480\ \mathrm{J}$ · Official APSCHE final key

Q136 AP EAMCET 2019 · 22 Apr · Shift 1 MCQ

A rocket is launched straight up from the surface of the earth. When its altitude is $\frac{1}{3}$ of the radius of the earth, its fuel runs out and therefore it coasts. If the rocket has to escape from the gravitational pull of the earth, the minimum velocity with which it should coast is (Escape velocity on the surface of the earth is $11.2\ \mathrm{kms^{-1}}$)

(A) $11.2\ \mathrm{kms}^{-1}$
(B) $10.7\ \mathrm{kms}^{-1}$
(C) $9.7\ \mathrm{kms}^{-1}$
(D) $8.7\ \mathrm{kms}^{-1}$

Answer: (C) $9.7\ \mathrm{kms}^{-1}$ · Official APSCHE final key

Q137 AP EAMCET 2019 · 22 Apr · Shift 2 MCQ

The gravitational potential difference between the surface of a planet and a point $20\ \mathrm{m}$ above it is $16\ \mathrm{J\,kg}^{-1}$. The workdone in moving a $4\ \mathrm{kg}$ body by $8\ \mathrm{m}$ on a slope of 60° from the horizontal is

(A) $22.17\ \mathrm{J}$
(B) $2.217\ \mathrm{J}$
(C) $221.7\ \mathrm{J}$
(D) $0.2217\ \mathrm{J}$

Answer: (A) $22.17\ \mathrm{J}$ · Official APSCHE final key

Q138 AP EAMCET 2019 · 21 Apr · Shift 1 MCQ

Two masses 90 kg and 160 kg are separated by a distance of 5 m. The magnitude of intensity of the gravitational field at a point which is at a distance 3 m from the 90 kg mass and 4 m from the 160 kg mass is (Universal gravitational constant = $6.67 \times 10^{-11}\ \mathrm{Nm^2\,kg^{-2}}$)

(A) $94.3 \times 10^{-10}\ \mathrm{N\,kg^{-1}}$
(B) $9.43 \times 10^{-10}\ \mathrm{N\,kg^{-1}}$
(C) $9.43 \times 10^{-12}\ \mathrm{N\,kg^{-1}}$
(D) $94.3 \times 10^{-12}\ \mathrm{N\,kg^{-1}}$

Answer: (B) $9.43 \times 10^{-10}\ \mathrm{N\,kg^{-1}}$ · Official APSCHE final key

Q139 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

Two bodies of masses m_1 and m_2 initially at rest at infinite distance apart move towards each other under gravitational force of attraction. Their relative velocity of approach when they are separated by a distance 'r' is
(G-Universal gravitational constant)

(A) $\left[\frac{2G(m_1-m_2)}{r}\right]^{1/2}$

(B) $\left[\frac{2G(m_1+m_2)}{r}\right]^{1/2}$

(C) $\left[\frac{r}{2G(m_1m_2)}\right]^{1/2}$

(D) $\left[\frac{2G}{r}m_1m_2\right]^{1/2}$

Answer: (B) $\left[\frac{2G(m_1+m_2)}{r}\right]^{1/2}$ · Official APSCHE final key

Q140 AP EAMCET 2019 · 20 Apr · Shift 1 MCQ

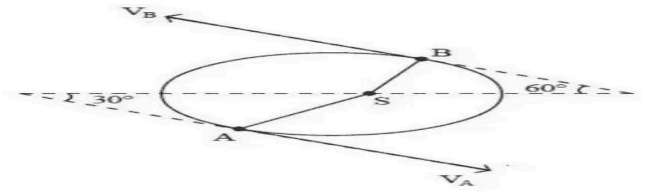
A planet is revolving around the sun as shown in the figure. The radius vectors joining the sun and the planet at points A and B are 90×10^6 km and 60×10^6 km respectively. The ratio of velocities of the planet at A and B when its velocities make 30° and 60° with major axis of the orbit is

(see the figure above)

Question Number : 92 Question Id : 1874633772 Question Type : MCQ Option Shuffling : Yes Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A planet is revolving around the sun as shown in the figure. The radius vectors joining the sun and the planet at points A and B are 90×10^6 km and 60×10^6 km respectively. The ratio of velocities of the planet at A and B when its velocities make 30° and 60° with major axis of the orbit is

పటంలో చూపిన విధంగా ఒక గ్రహం సూర్యుని చుట్టూ తిరుగుతున్నది. గ్రహాన్ని సూర్యున్ని కలిపే వ్యాసార్ధాల సదిశలు గ్రహం A మరియు B బిందువుల వద్ద వరుసగా 90×10^6 km మరియు 60×10^6 km దాని వేగాలు A మరియు B ల వద్ద దీర్ఘాక్షముతో వరుసగా 30° మరియు 60° చేస్తుంటే A మరియు B ల వద్ద ఆ గ్రహము వేగాల నిష్పత్తి



Options :

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

(A) $\frac{3}{2\sqrt{3}}$

(B) $\frac{2}{\sqrt{3}}$

(C) $\frac{1}{\sqrt{3}}$

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

Answer: (B) $\frac{2}{\sqrt{3}}$ · Official APSCHE final key

Q141 AP EAMCET 2019 · 20 Apr · Shift 2 MCQ

Two bodies each of mass 'm' are hung from a balance whose scale pans differ in a vertical height by h. If the mean density of the earth is ρ, the error in weighing is

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

Answer: (C) $\frac{8\pi\rho Gmh}{3}$ · Official APSCHE final key

Q142 TS EAMCET 2018 · 7 May · Shift 1 MCQ

An artificial satellite of mass m revolves around the Earth at a height h with a speed v. How much power (Energy per second) will it require to keep itself moving with constant speed in the orbit of radius r ?

(A) $\frac{mv^3}{r}$
(B) $\frac{1}{2}mv^2$
(C) $\frac{6mM_e}{(R_e+h)}$
(D) 0

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

Q143 TS EAMCET 2018 · 5 May · Shift 1 MCQ

From the pole of the earth, a body of mass 'm' is imparted a velocity 'v_o' directed vertically up. If 'M' is the mass of the earth, 'R' its radius and 'g' free-fall acceleration on its surface, the height 'h' to which the body will ascent is
(Neglect air resistance)

(A) $\frac{Rv_o^2}{(2gR-v_o^2)}$
(B) $\frac{Rv_o^2}{2gR}$
(C) R
(D) $\frac{Rv_o^2}{(2gR+v_o^2)}$

Answer: (A) $\frac{Rv_o^2}{(2gR-v_o^2)}$ · The council's preliminary key

Q144 TS EAMCET 2018 · 5 May · Shift 2 MCQ

The mass density inside a solid sphere of radius R varies as $\rho(r)=\rho_0\left(\frac{r}{R}\right)^{\beta}$, where ρ_0 and β are constants and r is the distance from the centre. Let E_1 and E_2 be gravitational fields due to sphere at distance $\frac{R}{2}$ and $2R$ from the centre of sphere. If $\frac{E_2}{E_1}=4$, the value of β is

(A) 2
(B) 2.5
(C) 3
(D) 4

Answer: (C) 3 · The council's preliminary key

Q145 TS EAMCET 2018 · 4 May · Shift 1 MCQ

The ratio of the height above the surface of earth to the depth below the surface of earth for gravitational accelerations to be the same (assuming small heights), is

(A) 0.25
(B) 0.5
(C) 1.0
(D) 1.25

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

Q146 TS EAMCET 2018 · 4 May · Shift 2 MCQ

The density of a solid sphere of radius R is $\rho(r) = 20\frac{r^2}{R^2}$, where r is the distance from its center. If the gravitational field due to this sphere at a distance $4R$ from its center is E and G is the gravitational constant, the ratio $\frac{E}{GR}$ is

(A) $\frac{\pi}{5}$
(B) 3π
(C) $\frac{3\pi}{2}$
(D) π

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

Q147 AP EAMCET 2018 · 24 Apr · Shift 1 MCQ

A body is projected vertically upwards from the surface of the Earth with a velocity sufficient to carry it to infinity. The time taken by it to reach a height of three times the radius of the Earth is (Acceleration due to gravity = $9.8\ \mathrm{ms}^{-2}$ and radius of the Earth = 6400 km)

(A) 44.44 minutes
(B) 22.22 minutes
(C) 18.76 minutes
(D) 37.52 minutes

Answer: (A) 44.44 minutes · The council's preliminary key

Q148 AP EAMCET 2018 · 24 Apr · Shift 2 MCQ

A satellite is to be placed in equatorial geostationary orbit around the earth for communication purpose. The height of such satellite is _____
($M_E = 6 \times 10^{24}$ kg, $R_E = 6400$ km)

(A) 3.57×10^8 m
(B) 3.57×10^7 m
(C) 3.57×10^5 m
(D) 3.57×10^6 m

Answer: (B) 3.57×10^7 m · The council's preliminary key

Q149 AP EAMCET 2018 · 23 Apr · Shift 1 MCQ

An artificial satellite of mass 'm' is moving along an elliptical path around the earth. The areal velocity of the satellite is proportional to

(A) m
(B) m^{-1}
(C) m^0
(D) $m^{1/2}$

Answer: (C) m^0 · The council's preliminary key

Q150 AP EAMCET 2018 · 23 Apr · Shift 2 MCQ

Two bodies of equal masses are some distance apart. If 20% of mass is transferred from the first body to the second body, the gravitational force between them

(A) Increases by 4%
(B) Increases by 14%
(C) Decreases by 4%
(D) Decreases by 14%

Answer: (C) Decreases by 4% · The council's preliminary key

Q151 AP EAMCET 2018 · 22 Apr · Shift 1 MCQ

Three masses m, 2m and 3m are arranged in two triangular configurations as shown in figure 1 and figure 2. Work done by an external agent in changing the configuration from figure 1 to figure 2 is
(see the figure above)

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Question Number : 92 Question Id : 4557343772 Question Type : MCQ Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

Three masses m, 2m and 3m are arranged in two triangular configurations as shown in figure 1 and figure 2. Work done by an external agent in changing the configuration from figure 1 to figure 2 is

మూడు ద్రవ్యరాశులు m, 2m మరియు 3m పటం 1 మరియు పటం 2లో చూపిన విధంగా రెండు త్రిభుజాకార అమరికలలో గలవు. ఈ ద్రవ్యరాశుల అమరికను పటం 1 నుండి పటం 2కు మార్చుటలో ఒక బాహ్య కారకం చేసిన పని

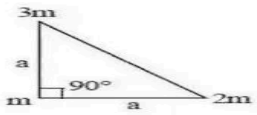

figure 1

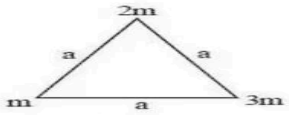

figure 2

Options :

1. $\frac{6Gm^2}{a}\left[2-\frac{6}{\sqrt{2}}\right]$
2. 0
3. $-\frac{Gm^2}{a}\left[6+\frac{6}{\sqrt{2}}\right]$
4. $-\frac{Gm^2}{a}\left[6-\frac{6}{\sqrt{2}}\right]$

(A) $\frac{6Gm^2}{a}\left[2-\frac{6}{\sqrt{2}}\right]$

(B) 0

(C) $-\frac{Gm^2}{a}\left[6+\frac{6}{\sqrt{2}}\right]$

(D) $-\frac{Gm^2}{a}\left[6-\frac{6}{\sqrt{2}}\right]$

Answer: (D) $-\frac{Gm^2}{a}\left[6-\frac{6}{\sqrt{2}}\right]$ · The council's preliminary key

Q152 AP EAMCET 2018 · 22 Apr · Shift 2 MCQ

An object is thrown vertically upwards from the surface of the earth with a velocity x times the escape velocity on the earth ($x < 1$), the maximum height to which it rises from the centre of the earth is (radius of earth is R)

(A) $R(1-x^2)$

(B) $\frac{R}{(1-x^2)}$

(C) $\frac{1-x^2}{R}$

(D) $\frac{x^2}{1-R}$

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

Q153 TS EAMCET 2017 · 12 May · Offline MCQ

A planet of mass 'm' moves in an elliptical orbit around an unknown star of mass 'M' such that its maximum and minimum distances from the star are equal to r_1 and r_2 respectively. The angular momentum of the planet relative to the centre of the star is

(A) $m\sqrt{\frac{2GMr_1r_2}{r_1+r_2}}$

(B) 0

(C) $m\sqrt{\frac{2GM(r_1+r_2)}{r_1r_2}}$

(D) $\sqrt{\frac{2GMm\,r_1}{(r_1+r_2)r_2}}$

Answer: (A) $m\sqrt{\frac{2GMr_1r_2}{r_1+r_2}}$ · The council's preliminary key

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Q154 AP EAMCET 2017 · 26 Apr · Shift 1 MCQ

Two bodies of masses 4 m and 9 m are seperated by a distance 'r'. The gravitational potential at a point on this line joining them where the gravitational field becomes zero is

(A) $\frac{-4Gm}{r}$

(B) $\frac{-25Gm}{r}$

(C) $\frac{-9Gm}{r}$

(D) $\frac{-13Gm}{r}$

Answer: (B) $\frac{-25Gm}{r}$ · The council's preliminary key

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Q155 AP EAMCET 2017 · 26 Apr · Shift 2 MCQ

The masses of two fixed spheres are M and 2M and the radius of each sphere is R. Their centres are 10R apart. The minimum speed with which a particle of mass $\frac{M}{10}$ be projected from the mid-point of the line joining the centres of the two spheres so that it escapes to infinity is _____

(A) $\sqrt{\frac{6GM}{7R}}$

(B) $\sqrt{\frac{7GM}{5R}}$

(C) $\sqrt{\frac{5GM}{6R}}$

(D) $\sqrt{\frac{6GM}{5R}}$

Answer: (D) $\sqrt{\frac{6GM}{5R}}$ · The council's preliminary key

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Q156 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

A particle is moving along a horizontal circle of radius 'r' under a centripetal force $\frac{-c}{r^2}$, where 'c' is a constant. Then, the total energy of the particle is

(A) $\frac{-c}{2r^2}$
(B) $\frac{c}{2r}$
(C) $\frac{-c}{2r}$
(D) $\frac{c}{2r^2}$

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

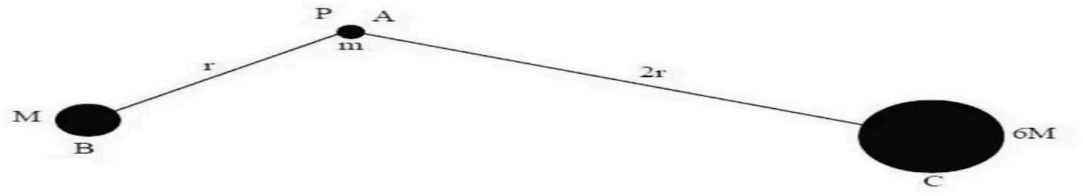
Q157 AP EAMCET 2017 · 25 Apr · Shift 1 MCQ

An object A of mass 'm' is located at a point 'P' at distances 'r' and '2 r' from two planets B and C of masses 'M' and '6M' respectively as shown in the figure. If the escape speed of the object A from point 'P' due to the gravitational influence of only planet B is 5 kms^{-1}, then the escape speed of the object A from point 'P' due to the gravitational influence of both the planets is _____ kms^{-1}.
(see the figure above)

Question Number : 92 Question Id : 1017174252 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

An object A of mass 'm' is located at a point 'P' at distances 'r' and '2 r' from two planet B and C of masses 'M' and '6M' respectively as shown in the figure. If the escape speed o the object A from point 'P' due to the gravitational influence of only planet B is 5 kms^{-1} then the escape speed of the object A from point 'P' due to the gravitational influence o both the planets is _____ kms^{-1}.

పటంలో చూపినట్లుగా, 'm' ద్రవ్యరాశి గల ఒక వస్తువు A, 'M' మరియు '6M' ద్రవ్యరాశులు గల రెండ గ్రహాలు B, C ల నుండి వరుసగా 'r', '2 r' ల దూరంలో 'P' బిందువు వద్ద వుంది. కేవలం B గ్రహ కలిగించే గురుత్వాకర్షణ వలన 'P' బిందువు నుండి A వస్తువు యొక్క పలాయన వడి 5 kms^{-1} అయితే గ్రహాలు రెండూ ఏకకాలంలో కలిగించే గురుత్వాకర్షణ ప్రభావం వలన 'P' బిందువు నుండి A వస్తువ యొక్క పలాయన వడి _____ kms^{-1}.



Options :
1. 1
2. 2.5
3. 5
4. 10

(A) 1
(B) 2.5
(C) 5
(D) 10

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

Q158 AP EAMCET 2017 · 25 Apr · Shift 2 MCQ

Three solid spheres each of mass 1 kg and radius 2 m are arranged at the three corners of an equilateral triangle of side 10 m, such that centres of the spheres coincide with the corners of the

triangle. When they are released from that position, the speed of any one sphere at the time of collision would be (G is universal gravitational constant).

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

Answer: (A) $\sqrt{\frac{3G}{10}}$ · The council's preliminary key

Q159 AP EAMCET 2017 · 24 Apr · Shift 1 MCQ

The required percentage increase in the energy of the earth's satellite to shift it from an orbit of radius r to $\frac{3r}{2}$.

(A) 16.67%
(B) 20.33%
(C) 66.67%
(D) 33.33%

Answer: (D) 33.33% · The council's preliminary key

Q160 AP EAMCET 2017 · 24 Apr · Shift 2 MCQ

A planet revolving round the Sun in an elliptical orbit, whose semi-major axis is double that of its semi-minor axis. When the Sun is assumed to be at rest at the mid point of semi-major axis, planet takes 24 hours to travel through a path bcd as shown in the figure. Then the time taken by the planet to travel along dab is _____

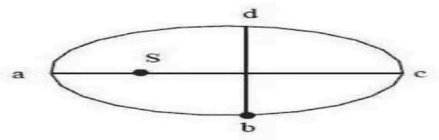
(see the figure above)

EdLoop EAPCET

Question Number : 92 Question Id : 1017173932 Display Question Number : Yes Single Line Question Option : No Option Orientation : Vertical

A planet revolving round the Sun in an elliptical orbit, whose semi-major axis is double tha of its semi-minor axis. When the Sun is assumed to be at rest at the mid point o semi-major axis, planet takes 24 hours to travel through a path bcd as shown in the figure Then the time taken by the planet to travel along dab is _____

దీర్ఘవృత్తాకార కక్ష్యలో ఒక గ్రహం సూర్యుడి చుట్టూ పరిభ్రమిస్తుంది. దీర్ఘవృత్తానికి మధ్య బిందువు వద్ద సూర్యుడు స్థిరంగా ఉన్నాడని ఊహిస్తే, ఆ గ్రహం bcd మార్గం గుండా పటంలో చూపిన విధంగా ప్రయాణించడానికి 24 గంటల సమయం తీసుకుంటుంది. ఆ గ్రహం dab మార్గంలో ప్రయాణించడానికి పట్టే కాలం _____



Options :

1. 744 minutes
744 నిమిషాలు
2. 634 minutes
634 నిమిషాలు
3. 804 minutes
804 నిమిషాలు
4. 1440 minutes
1440 నిమిషాలు

(A) 744 minutes
(B) 634 minutes
(C) 804 minutes
(D) 1440 minutes

Answer: (A) 744 minutes · The council's preliminary key

Q161 TS EAMCET 2016 · 15 May · Offline MCQ

The bodies of masses 100 kg and 8100 kg are held at a distance of 1 m. The gravitational field at a point on the line joining them is zero. The gravitational potential at that point in J/kg is ($G = 6.67 \times 10^{-11}\ \mathrm{N.m^2/kg^2}$)

(A) -6.67×10^{-7}
(B) -6.67×10^{-10}
(C) -13.34×10^{-7}
(D) -6.67×10^{-9}

Answer: (A) -6.67×10^{-7} · Official TGCHE final key

Q162 AP EAMCET 2016 · 29 Apr · Offline MCQ

Two bodies of masses 'm' and '9m' are placed at a distance 'r'. The gravitational potential at a point on the line joining them, where gravitational field is zero, is (G is universal gravitational constant)

(A) $\frac{-14Gm}{r}$

(B) $\frac{-16Gm}{r}$

(C) $\frac{-12Gm}{r}$

(D) $\frac{-8Gm}{r}$

Answer: (B) $\frac{-16Gm}{r}$ · The council's preliminary key

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Q163 AP EAMCET 2014 · 22 May · Offline MCQ

A satellite is revolving very close to a planet of density ρ. The period of revolution of satellite is

(A) $\sqrt{\frac{3\pi\rho}{G}}$

(B) $\sqrt{\frac{3\pi}{2\rho G}}$

(C) $\sqrt{\frac{3\pi}{\rho G}}$

(D) $\sqrt{\frac{3\pi G}{\rho}}$

Answer: (C) $\sqrt{\frac{3\pi}{\rho G}}$ · The council's preliminary key

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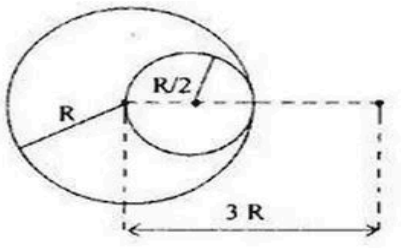
Q164 AP EAMCET 2013 · 10 May · Offline MCQ

The gravitational force acting on a particle, due to a solid sphere of uniform density and radius R, at a distance of 3R from the centre of the sphere is F_1. A spherical hole of radius (R/2) is now made in the sphere as shown in the figure. The sphere with hole now exerts a force F_2 on the same particle. Ratio of F_1 to F_2 is

(see the figure above)

91. The gravitational force acting on a particle, due to a solid sphere of uniform density and radius R, at a distance of 3R from the centre of the sphere is F_1. A spherical hole of radius (R/2) is now made in the sphere as shown in the figure. The sphere with hole now exerts a force F_2 on the same particle. Ratio of F_1 to F_2 is

ఏక రీతి సాంద్రత మరియు R వ్యాసార్ధము గల ఒక ఘన గోళము కేంద్రము నుండి 3R దూరములో గల కణముపై పని చేస్తున్న గురుత్వాకర్షణ బలము F_1. పటములో చూపిన విధముగా (R/2) వ్యాసార్ధము గల ఒక గోళాకార రంధ్రము, ఆ గోళములో చేయబడినది. ఆ రంధ్రముతో ఉన్న ఆ గోళము, అదే కణముపై F_2 బలాన్ని కలుగచేస్తుంది. F_1, F_2 ల నిష్పత్తి



(1) $\frac{50}{41}$ (2) $\frac{41}{50}$ (3) $\frac{41}{25}$ (4) $\frac{25}{41}$

(A) $\frac{50}{41}$
(B) $\frac{41}{50}$
(C) $\frac{41}{25}$
(D) $\frac{25}{41}$

Answer: (A) $\frac{50}{41}$ · The council's preliminary key

Q165 AP EAMCET 2012 · 12 May · Offline MCQ

The gravitational field in a region is given by equation $\vec{E} = (5\hat{i} + 12\hat{j})$ N/kg. If a particle of mass 2 kg is moved from the origin to the point (12 m, 5 m) in this region, the change in gravitational potential energy is

(A) -225 J
(B) -240 J
(C) -245 J
(D) -250 J

Answer: (B) -240 J · Official APSCHE final key

Q166 AP EAMCET 2011 · 8 May · Offline MCQ

Assertion (A) : An astronaut inside a massive spaceship orbiting around the earth will experience a finite but small gravitational force.
Reason (R) : The centripetal force necessary to keep the spaceship in orbit around the earth is provided by the gravitational force between the earth and the spaceship.

(A) Both (A) and (R) are true and (R) is the correct explanation of (A)
(B) Both (A) and (R) are true and (R) is not the correct explanation of (A)
(C) (A) is true but (R) is not true
(D) (A) is not true but (R) is true

Options (2) or (4) were accepted. More than one answer was accepted. · The council's preliminary key

Q167 AP EAMCET 2010 · 30 May · Offline MCQ

A launching vehicle carrying an artificial satellite of mass 'm' is set for launch on the surface of the earth of mass 'M' and radius 'R'. If the satellite is intended to move in a circular orbit of radius 7R, the minimum energy required to be spent by the launching vehicle on the satellite is : (Gravitational constant = G)

(A) $\frac{GMm}{R}$
(B) $\frac{13GMm}{14R}$
(C) $\frac{GMm}{7R}$
(D) $\frac{GMm}{14R}$

Answer: (B) $\frac{13GMm}{14R}$ · Official APSCHE final key