

NEET GRAVITATION — ACCELERATION DUE TO GRAVITY AND ITS VARIATION (ALTITUDE, DEPTH, ROTATION) — PYQS

Max. Marks: 60

Questions: 15

Section A (MCQ) — 15 questions

- Q.1** A body weighs 48 N on the surface of the earth. The gravitational force experienced by the body due to the earth at a height equal to one-third the radius of the earth from its surface is:

[NEET (UG) 2025]

- (1) 32 N (2) 36 N (3) 16 N (4) 27 N

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- Q.2** The mass of a planet is $\frac{1}{10}$ th that of the earth and its diameter is half that of the earth. The acceleration due to gravity on that planet is:

[NEET (UG) 2024]

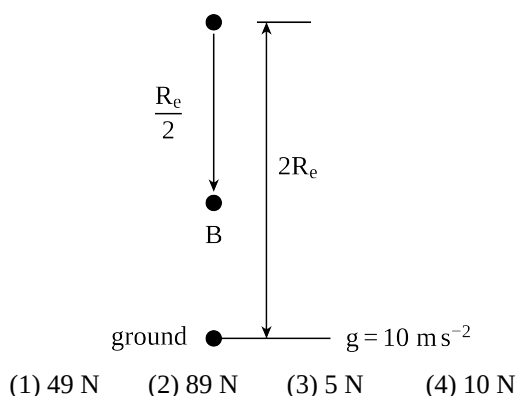
- (1) 19.6 m s^{-2} (2) 9.8 m s^{-2}
(3) 4.9 m s^{-2} (4) 3.92 m s^{-2}

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- Q.3** An object of mass 100 kg falls from point A to B as shown in figure. The change in its weight, corrected to the nearest integer is (R_E is the radius of the earth)

[RE-NEET (UG) 2024]



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- Q.4** A body weighs 72 N on the surface of the earth. What is the gravitational force on it, at a height equal to half the radius of the earth?

[NEET (UG) 2020]

- (1) 32 N (2) 30 N (3) 24 N (4) 48 N

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- Q.5** A body weighs 200 N on the surface of earth. How much will it weigh half way down to the centre of the earth?

[NEET (UG) 2019]

- (1) 200 N (2) 250 N (3) 100 N (4) 150 N

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- Q.6** If the mass of the Sun were ten times smaller and the universal gravitational constant were ten times larger in magnitude, which of the following is not correct?

[NEET 2018]

- (1) Raindrops will fall faster.
(2) Walking on the ground would become more difficult.
(3) Time period of a simple pendulum on the Earth would decrease.
(4) g on the Earth will not change.

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- Q.7** The acceleration due to gravity at a height 1 km above the earth is the same as at a depth d below the surface of earth. Then

[NEET 2017]

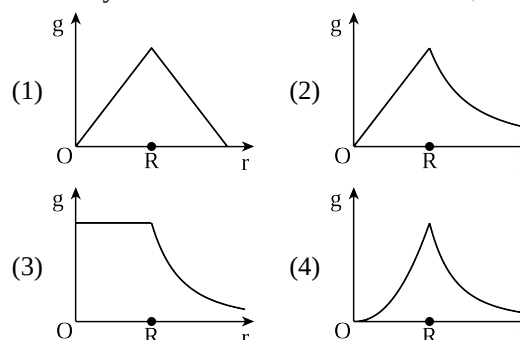
- (1) $d = 1 \text{ km}$ (2) $d = \frac{3}{2} \text{ km}$
(3) $d = 2 \text{ km}$ (4) $d = \frac{1}{2} \text{ km}$

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- Q.8** Starting from the centre of the earth having radius R , the variation of g (acceleration due to gravity) is shown by

[NEET 2016 (Phase 2)]



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- Q.9** The height at which the weight of a body becomes $\left(\frac{1}{16}\right)^{\text{th}}$ of its weight on the surface of earth (radius R), is [AIPMT 2012 (Prelims)]
 (1) $5R$ (2) $15R$ (3) $3R$ (4) $4R$

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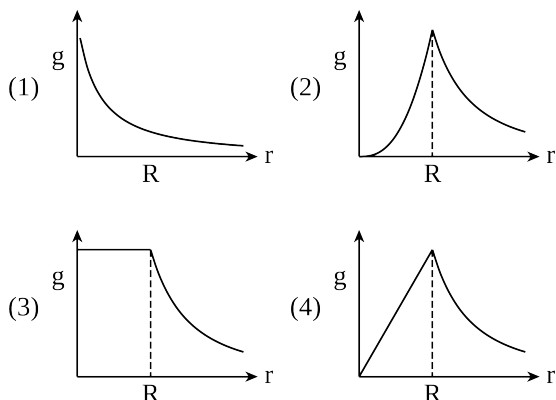


- Q.10** A spherical planet has a mass M_p and diameter D_p . A particle of mass m falling freely near the surface of this planet will experience an acceleration due to gravity, equal to [AIPMT 2012 (Prelims)]
 (1) $\frac{4GM_p}{D_p^2}$ (2) $\frac{GM_{pm}}{D_p^2}$ (3) $\frac{GM_p}{D_p^2}$ (4) $\frac{4GM_{pm}}{D_p^2}$

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- Q.11** The dependence of acceleration due to gravity g on the distance r from the centre of the earth, assumed to be a sphere of radius R of uniform density is as shown in figures below



The correct figure is

[AIPMT 2010 (Mains)]

- (1) (4) (2) (1) (3) (2) (4) (3)

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- Q.12** Imagine a new planet having the same density as that of earth but it is 3 times bigger than the earth in size. If the acceleration due to gravity on the surface of earth is g and that on the surface of the new planet is g' , then [AIPMT 2005]
 (1) $g' = g/9$ (2) $g' = 27g$ (3) $g' = 9g$ (4) $g' = 3g$

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- Q.13** The density of a newly discovered planet is twice that of earth. The acceleration due to gravity at the surface of the planet is equal to that at the surface of the earth. If the radius of the earth is R , the radius of the planet would be [AIPMT 2004]

- (1) $2R$ (2) $4R$ (3) $\frac{1}{4}R$ (4) $\frac{1}{2}R$

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- Q.14** The acceleration due to gravity on the planet A is 9 times the acceleration due to gravity on planet B. A man jumps to a height of 2 m on the surface of A. What is the height of jump by the same person on the planet B? [AIPMT 2003]
 (1) $(2/9)$ m (2) 18 m (3) 6 m (4) $(2/3)$ m

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- Q.15** A body of weight 72 N moves from the surface of earth at a height half of the radius of earth, then gravitational force exerted on it will be [AIPMT 2000]
 (1) 36 N (2) 32 N (3) 144 N (4) 50 N

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ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	4	4	1	1	3	4	3	2	3	1	1
Ques.	12	13	14	15							
Ans.	4	4	2	2							