

## Gravitation – MCQs

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1. The force of gravitation between two bodies is:

- A) Always repulsive
  - B) Always attractive
  - C) May be repulsive or attractive
  - D) Zero
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2. The universal law of gravitation was given by:

- A) Einstein
  - B) Kepler
  - C) Newton
  - D) Galileo
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3. Gravitational force between two objects is inversely proportional to:

- A) Sum of their masses
  - B) Product of their volumes
  - C) Square of the distance between them
  - D) Cube of the distance between them
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4. Value of the universal gravitational constant  $G$  is:

- A)  $6.67 \times 10^{-11} \text{ Nm}^2/\text{kg}^2$
  - B)  $9.8 \text{ m/s}^2$
  - C)  $1.67 \times 10^{-27} \text{ kg}$
  - D)  $3 \times 10^8 \text{ m/s}^3$
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5. The SI unit of gravitational constant  $G$  is:

- A) N/kg
  - B)  $\text{N} \cdot \text{m}^2/\text{kg}^2$
  - C)  $\text{m/s}^2$
  - D) J/kg
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6. Acceleration due to gravity on the surface of Earth is approximately:

- A)  $8.9 \text{ m/s}^2$
- B)  $10 \text{ m/s}^2$
- C)  $9.8 \text{ m/s}^2$
- D)  $9.2 \text{ m/s}^2$

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**7. The weight of a body is:**

- A) Mass  $\times$  velocity
  - B) Mass  $\times$  acceleration
  - C) Mass  $\times$  acceleration due to gravity
  - D) Mass / volume
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**8. The value of  $g$  decreases with:**

- A) Height above the Earth's surface
  - B) Depth below the Earth's surface
  - C) Both A and B
  - D) Neither A nor B
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**9. The weight of a body is maximum at:**

- A) Equator
  - B) Poles
  - C) Center of the Earth
  - D) Moon
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**10. If radius of Earth becomes twice, but mass remains the same, the value of  $g$  on the surface would:**

- A) Increase four times
  - B) Decrease four times
  - C) Double
  - D) Halve
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**11. A satellite is in orbit due to:**

- A) Earth's rotation
  - B) Earth's gravity providing centripetal force
  - C) Its own gravity
  - D) Air resistance
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**12. Which of the following quantities remains constant in a satellite's uniform circular motion?**

- A) Speed
  - B) Velocity
  - C) Acceleration
  - D) Height
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**13. The escape velocity from Earth's surface is nearly:**

- A) 7.9 km/s
  - B) 9.8 km/s
  - C) 11.2 km/s
  - D) 12.6 km/s
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**14. The force of gravity between two objects depends on:**

- A) Mass of both objects and distance between them
  - B) Shape of objects
  - C) Area of contact
  - D) Surface roughness
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**15. The acceleration due to gravity at the center of Earth is:**

- A)  $9.8 \text{ m/s}^2$
  - B) Infinity
  - C) Zero
  - D)  $4.9 \text{ m/s}^2$
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**16. Which law states that every object in the universe attracts every other object?**

- A) Kepler's second law
  - B) Newton's law of gravitation
  - C) Law of inertia
  - D) Law of momentum conservation
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**17. If Earth had no atmosphere, the value of escape velocity would:**

- A) Increase
  - B) Decrease
  - C) Remain the same
  - D) Become zero
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**18. The orbital velocity of a satellite depends on:**

- A) Mass of the satellite
  - B) Height of orbit
  - C) Mass of Earth
  - D) Both B and C
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**19. The gravitational potential energy of a body on the surface of Earth is:**

- A) Zero
  - B) Positive
  - C) Negative
  - D) Maximum
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**20. If mass of Earth becomes 4 times and radius becomes 2 times, then the value of  $g$  becomes:**

- A) Same
  - B) Double
  - C) Quadruple
  - D) Halved
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**Answer Key**

- 1. B
- 2. C
- 3. C
- 4. A
- 5. B
- 6. C
- 7. C
- 8. C
- 9. B
- 10. B
- 11. B
- 12. A
- 13. C
- 14. A
- 15. C
- 16. B
- 17. C
- 18. D
- 19. C
- 20. B