

CLASS XI PHY CH: 7

SET 2 – GRAVITATION

1. Newton's law of gravitation is valid for:

- (a) only Earth
 - (b) only celestial bodies
 - (c) all particles in the universe
 - (d) microscopic particles only
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2. The gravitational force between two masses m_1 and m_2 separated by distance r is proportional to:

- (a) $m_1 m_2 / r^2$
 - (b) $m_1 m_2 / r$
 - (c) $m_1 + m_2$
 - (d) $r^2 / m_1 m_2$
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3. The unit of G in SI system is:

- (a) $\text{N} \cdot \text{m} / \text{kg}^2$
 - (b) $\text{N} \cdot \text{m}^2 / \text{kg}^2$
 - (c) J / kg^2
 - (d) $\text{N} \cdot \text{m}^2 / \text{s}^2$
-

4. If the mass of Earth increases four times and radius doubles, g will become:

- (a) twice
 - (b) same
 - (c) half
 - (d) four times
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5. The acceleration due to gravity does not depend on:

- (a) mass of the object
 - (b) radius of Earth
 - (c) mass of Earth
 - (d) altitude
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6. Value of G on the surface and in space is:

- (a) same
- (b) zero

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- (c) maximum at surface
 - (d) minimum in space
-

7. The value of G was determined by:

- (a) Cavendish
 - (b) Newton
 - (c) Kepler
 - (d) Galileo
-

8. G is called:

- (a) universal gravitational constant
 - (b) gravitational parameter
 - (c) gravity coefficient
 - (d) acceleration constant
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9. The value of g depends on:

- (a) latitude
 - (b) altitude
 - (c) depth
 - (d) all of these
-

10. At the centre of Earth, the value of g is:

- (a) zero
 - (b) maximum
 - (c) infinite
 - (d) 9.8 m/s^2
-

11. The acceleration due to gravity decreases with:

- (a) height
 - (b) depth
 - (c) rotation of Earth
 - (d) all of these
-

12. The gravitational potential energy (U) between two masses m_1 and m_2 separated by r is:

- (a) $-Gm_1m_2/r$
- (b) Gm_1m_2/r

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- (c) $-Gm_1m_2/r^2$
 - (d) Gm_1m_2/r^2
-

13. Gravitational field intensity at a point is defined as:

- (a) Force per unit mass
 - (b) Mass per unit force
 - (c) Energy per unit area
 - (d) Work done per unit distance
-

14. The potential energy is zero when two bodies are:

- (a) infinitely apart
 - (b) at contact
 - (c) at a distance r
 - (d) at rest
-

15. A satellite in a circular orbit has kinetic energy equal to:

- (a) $GMm/2R$
 - (b) GMm/R
 - (c) $GMm/4R$
 - (d) $GMm/3R$
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16. The total energy of a satellite in circular orbit is:

- (a) $-GMm/2R$
 - (b) $GMm/2R$
 - (c) $-GMm/R$
 - (d) GMm/R
-

17. The escape velocity depends on:

- (a) radius and mass of planet
 - (b) mass of satellite
 - (c) medium
 - (d) all of these
-

18. The escape velocity from Earth's surface is approximately:

- (a) 11.2 km/s
- (b) 9.8 km/s

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- (c) 7.9 km/s
 - (d) 8.5 km/s
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19. The escape velocity from Moon is about:

- (a) 2.4 km/s
 - (b) 11.2 km/s
 - (c) 9.8 km/s
 - (d) 5.8 km/s
-

20. The height of a geostationary satellite above Earth's surface is about:

- (a) 36,000 km
 - (b) 42,000 km
 - (c) 3,600 km
 - (d) 6,400 km
-

21. The time period of a geostationary satellite is:

- (a) 24 hours
 - (b) 12 hours
 - (c) 6 hours
 - (d) 48 hours
-

22. A geostationary satellite revolves:

- (a) west to east
 - (b) east to west
 - (c) in a plane perpendicular to equator
 - (d) through poles
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23. For a satellite orbiting near Earth, the orbital speed is:

- (a) 7.9 km/s
 - (b) 9.8 km/s
 - (c) 11.2 km/s
 - (d) 5 km/s
-

24. Kepler's first law is the law of:

- (a) elliptical orbits
- (b) areas

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- (c) periods
 - (d) gravitation
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25. Kepler's second law states that:

- (a) Equal areas are swept in equal intervals of time
 - (b) Planets move in circular orbits
 - (c) Acceleration is proportional to mass
 - (d) Force is inversely proportional to square of distance
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26. Kepler's third law gives the relation between:

- (a) period and radius
 - (b) speed and mass
 - (c) energy and distance
 - (d) acceleration and time
-

27. The gravitational potential at infinity is taken as:

- (a) zero
 - (b) maximum
 - (c) minimum
 - (d) negative
-

28. Weight of a body is given by:

- (a) mg
 - (b) m/g
 - (c) g/m
 - (d) m^2g
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29. Weight of a body at the equator is:

- (a) less than at poles
 - (b) more than at poles
 - (c) equal to that at poles
 - (d) independent of latitude
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30. The orbital velocity of Earth around the Sun is nearly:

- (a) 30 km/s
- (b) 3 km/s

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- (c) 7.9 km/s
 - (d) 10 km/s
-

31. The time period of Moon's revolution around Earth is:

- (a) 27.3 days
 - (b) 365 days
 - (c) 24 hours
 - (d) 12 hours
-

32. The acceleration due to gravity on Moon is:

- (a) 1/6th of Earth's
 - (b) 6 times Earth's
 - (c) equal to Earth's
 - (d) 9.8 m/s^2
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33. The gravitational potential energy of a satellite in orbit is:

- (a) $-GMm/R$
 - (b) GMm/R
 - (c) $GMm/2R$
 - (d) zero
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34. Gravitational field is a:

- (a) conservative field
 - (b) non-conservative field
 - (c) electric field
 - (d) uniform field
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35. Gravitational force between two unit masses separated by 1 m is called:

- (a) Gravitational constant
 - (b) Gravitational acceleration
 - (c) Gravitational potential
 - (d) Gravitational intensity
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36. The work done by gravitational force in moving a mass in closed path is:

- (a) zero
- (b) positive

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- (c) negative
 - (d) infinite
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37. Gravitational potential is a:

- (a) scalar quantity
 - (b) vector quantity
 - (c) tensor quantity
 - (d) none
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38. A body experiences weightlessness in:

- (a) free fall
 - (b) stationary condition
 - (c) constant acceleration
 - (d) uniform motion
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39. The escape velocity does not depend on:

- (a) mass of body
 - (b) radius of Earth
 - (c) gravitational constant
 - (d) density of Earth
-

40. The energy required to launch a satellite depends on:

- (a) mass of satellite
 - (b) height of orbit
 - (c) both (a) and (b)
 - (d) none
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41. The ratio of escape velocity to orbital velocity for a planet is:

- (a) $\sqrt{2}$
 - (b) 2
 - (c) 1
 - (d) $1/\sqrt{2}$
-

42. The total mechanical energy of a satellite in circular orbit is:

- (a) negative
- (b) positive

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- (c) zero
 - (d) infinite
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43. The weight of a body at the centre of Earth is:

- (a) zero
 - (b) maximum
 - (c) minimum
 - (d) same as surface
-

44. The value of g decreases with:

- (a) height
 - (b) depth
 - (c) rotation
 - (d) all of these
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45. The potential energy of a satellite in orbit is:

- (a) negative
 - (b) positive
 - (c) zero
 - (d) depends on height
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46. Gravitational force between two bodies is doubled if:

- (a) distance is halved
 - (b) both masses are doubled
 - (c) both (a) and (b)
 - (d) none
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47. The gravitational constant G is:

- (a) independent of medium
 - (b) depends on medium
 - (c) depends on temperature
 - (d) depends on mass
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48. The potential energy of a body at infinity is:

- (a) zero
- (b) maximum

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- (c) minimum
 - (d) negative
-

49. The orbital energy of a satellite is equal to:

- (a) $-GMm/2R$
 - (b) $GMm/2R$
 - (c) $-GMm/R$
 - (d) GMm/R^2
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50. The binding energy of a satellite =

- (a) $GMm/2R$
 - (b) GMm/R
 - (c) $-GMm/R$
 - (d) $GMm/4R$
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Answers – SET 2

- 1 (c) 2 (a) 3 (b) 4 (a) 5 (a) 6 (a) 7 (a) 8 (a) 9 (d) 10 (a)
11 (d) 12 (a) 13 (a) 14 (a) 15 (a) 16 (a) 17 (a) 18 (a) 19 (a) 20 (a)
21 (a) 22 (a) 23 (a) 24 (a) 25 (a) 26 (a) 27 (a) 28 (a) 29 (a) 30 (a)
31 (a) 32 (a) 33 (a) 34 (a) 35 (a) 36 (a) 37 (a) 38 (a) 39 (a) 40 (c)
41 (a) 42 (a) 43 (a) 44 (d) 45 (a) 46 (c) 47 (a) 48 (a) 49 (a) 50 (a)