

QB365 Question Bank Software Study Materials

Gravitation 50 Important 1 Marks Questions With Answers (Book Back and Creative)

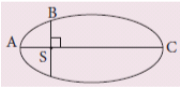
11th Standard

Physics

Total Marks : 50

Multiple Choice Question

50 x 1 = 50

- 1) The linear momentum and position vector of the planet is perpendicular to each other at
(a) perihelion and aphelion (b) at all points (c) only at perihelion (d) no point
- 2) If the masses of the Earth and Sun suddenly double, the gravitational force between them will
(a) remain the same (b) increase 2 times **(c) increase 4 times** (d) decrease 2 times
- 3) A planet moving along an elliptical orbit is closest to the Sun at distance r_1 and farthest away at a distance of r_2 . If v_1 and v_2 are linear speeds at these points respectively. Then the ratio $\frac{v_1}{v_2}$ is
(a) $\frac{r_2}{r_1}$ (b) $(\frac{r_2}{r_1})^2$ (c) $\frac{r_1}{r_2}$ (d) $(\frac{r_1}{r_2})^2$
- 4) The time period of a satellite orbiting Earth in a circular orbit is independent of
(a) Radius of the orbit **(b) The mass of the satellite** (c) Both the mass and radius of the orbit
(d) Neither the mass nor the radius of its orbit
- 5) If the distance between the Earth and Sun were to be doubled from its present value, the number of days in a year would be
(a) 64.5 **(b) 1032** (c) 182.5 (d) 730
- 6) According to Kepler's second law, the radial vector to a planet from the Sun sweeps out equal areas in equal intervals of time. This law is a consequence of
(a) conservation of linear momentum **(b) conservation of angular momentum** (c) conservation of energy
(d) conservation of kinetic energy
- 7) The gravitational potential energy of the Moon with respect to Earth is
(a) always positive **(b) always negative** (c) can be positive or negative (d) always zero
- 8) The kinetic energies of a planet in an elliptical orbit about the Sun, at positions A, B and C are K_A , K_B and K_C respectively. AC is the major axis and SB is perpendicular to AC at the position of the Sun S as shown in the figure. Then

(a) $K_A > K_B > K_C$ (b) $K_B < K_A < K_C$ (c) $K_A < K_B < K_C$ (d) $K_B > K_A > K_C$
- 9) The work done by the Sun's gravitational force on the Earth is
(a) always zero (b) always positive **(c) can be positive or negative** (d) always negative
- 10) If the mass and radius of the Earth are both doubled, then the acceleration due to gravity g'
(a) remains same **(b) $\frac{g}{2}$** (c) $2g$ (d) $4g$
- 11) The magnitude of the Sun's gravitational field as experienced by Earth is
(a) same over the year (b) decreases in the month of January and increases in the month of July
(c) decreases in the month of July and increases in the month of January
(d) increases during day time and decreases during night time
- 12) If a person moves from Chennai to Trichy, his weight

- (a) increases **(b) decreases** (c) remains same (d) increases and then decreases
- 13) An object of mass 10 kg is hanging on a spring scale which is attached to the roof of a lift. If the lift is in free fall, the reading in the spring scale is
- (a) 98 N **(b) zero** (c) 49 N (d) 9.8 N
- 14) If the acceleration due to gravity becomes 4 times its original value, then escape speed
- (a) remains same **(b) 2 times of original value** (c) becomes halved (d) 4 times of original value
- 15) The kinetic energy of the satellite orbiting around the Earth is
- (a) equal to potential energy **(b) less than potential energy** (c) greater than kinetic energy (d) zero
- 16) In the following, what are the quantities which that are conserved?
- (a) Linear momentum of planet (b) Angular momentum of planet **(c) Total energy of planet**
(d) Potential energy of a planet
- 17) The work done by Sun on Earth in one year will be
- (a) zero (b) non-zero (c) positive **(d) negative**
- 18) The work done by Sun on Earth at any finite interval of time is
- (a) Positive, negative or zero (b) Strictly positive **(c) Strictly negative** (d) It is always zero
- 19) A body projected electrically from the earth reaches a height equal to earth's radius before returning to the earth: The power exerted by the gravitational force is greatest _____.
- (a) at the highest position of the body (b) at the instant just before the body hits the earth
(c) it remains constant all through **(d) at the instant just after the body is projected**
- 20) Two spherical balls of mass 10hg are placed 10cm apart. Find gravitational force of attraction between them _____.
- (a) the earth does not attract the objects in a satellite
(b) the normal force by chair on the person balances the earth attraction **(c) the normal force is zero**
(d) the person in sattelite is not accelerated
- 21) A liquid can easily change its shape but a solid can not because _____.
- (a) the density of a liquid is smaller than that of a solid
(b) the forces between the molecules is stronger in solid than in liquids
(c) the atoms combine to form bigger molecules in a solid
(d) the average separation between the molecules is larger in solids
- 22) A baker contacting a liquid is kept inside a big closed jar if the air inside the far is continuously pumped out, the pressure in the liquid near the bottom will_____.
- (a) increase **(b) decrease** (c) remain constant (d) first decrease and then increase
- 23) In a streamline flow _____.
- (a) the speed ofa particle always remain same (b) the velocity of a particle always remains same
(c) the kinetic energies of all the particles arriving at a given point at the same
(d) the moments of the particles arriving at a given point are different
- 24) Water flows throw 2 identical tubes A & B, A volume V_0 of water posses throw the tube A & $2V_0$ throw B in a given time. Which of the following may be correct?
- (a) Flow in both the tubes are steady (b) Flow in both the tubes are turbulent (c) Flow is steady in A but turbulent in B
(d) All the above

- 25) A piece of wood is taken deep inside a long column of water & released it will move up.
- (a) with a constant upward acceleration **(b) with decreasing upward acceleration** (c) with a deceleration
 (d) there will be uniform velocity
- 26) The properties of a surface are different from those of the bulk liquid because the surface molecules are _____.
- (a) are smaller than other molecules (b) acquire charge due to collision from air molecules
(c) find different type of molecules in their range of influence (d) feel a net force in different direction
- 27) According to Kepler, planet move in _____.
- (a) Circular orbits around the Sun (b) Elliptical orbits around the Sun with Sun at exact centre
 (c) Straight lines with constant velocity **(d) Elliptical orbits around the Sun with Sun at one of its foci**
- 28) The period of revolution of planet A around the Sun is 8 times that of B. The distance of A from the Sun is how many times greater than that of B from the Sun _____.
- (a) 2 (b) 3 **(c) 4** (d) 5
- 29) The mass of the earth is 6×10^{24} kg and that of the Moon is 7.4×10^{22} kg. The constant of gravitation G is $6.67 \times 10^{-11} \text{ Nm}^2 \text{ kg}^{-2}$. The potential energy of the system is -7.79×10^{28} J. The mean distance between the Earth and Moon is _____ metre.
- (a) 3.80×10^8** (b) 3.37×10^8 (c) 7.60×10^8 (d) 1.90×10^2
- 30) A body of mass m is taken from the Earth's surface to a height equal to the radius R of the earth. If g is the acceleration to gravity at the surface of the Earth, then find the change in the potential energy of the body _____
- (a) $\frac{1}{4}mgR$ **(b) $\frac{1}{2}mgR$** (c) mgR (d) $2mgR$
- 31) The escape velocity of a body on the surface of the Earth is 11.2 km/s. If the mass of the Earth is increase to twice its present value and the radius of the earth becomes half, the escape velocity becomes = _____ kms^{-1} .
- (a) 5.6 (b) 11.2 **(c) 22.4** (d) 494.8
- 32) The velocity with which a projectile must be fired so that it escapes Earth's gravitational does not depend on _____
- (a) Mass of Earth (b) Radius of the projectile's orbit **(c) Mass of the projectile** (d) Gravitational constant
- 33) As astronaut orbiting the earth in a circular orbit 120 km above the surface of Earth, gently drops a spoon out of space-ship. The spoon will _____.
- (a) fall vertically down to the Earth (b) move towards the moon **(c) will move along with space-ship**
 (d) will move in an irregular way then fall down to Earth
- 34) The acceleration due to gravity near the surface of a planet of radius R and density d is proportional to _____.
- (a) $\frac{d}{R^2}$ (b) dR^2 **(c) dR** (d) $\frac{d}{R}$
- 35) At the centre of the Earth, the value of acceleration due to gravity is
- (a) infinite (b) finite (c) unity **(d) zero**
- 36) The value of acceleration due to gravity varies
- (a) inversely as the square of radius of the Earth** (b) directly as the square of radius of the Earth
 (c) directly as the radius of the Earth (d) none of the above
- 37) The value of gravitational field intensity due to a body of mass m at an infinite distance is
- (a) infinity (b) finite (c) unity **(d) zero**
- 38) The nature of gravitational potential is
- (a) positive (b) finite **(c) negative** (d) imaginary

- 39) At a depth half way to the centre of the Earth, the weight of a body becomes
(a) half of its original weight (b) double of its original weight (c) one fourth of its original weight
 (d) one eighth of its original weight
- 40) If the Earth stops rotating, the value of acceleration due to gravity at the equator will
 (a) decrease (b) increase **(c) remain the same** (d) becomes zero
- 41) The only natural satellite of the Earth is
(a) Moon (b) Jupiter (c) Aryabatta (d) Mars
- 42) Mars has about 1/10th as much as the Earth and half as great a diameter. The acceleration of falling body on Mars is about
 (a) 9.8 m/s^2 (b) 4.9 m/s^2 (c) 1.96 m/s^2 **(d) 3.92 m/s^2**
- 43) The increase in gravitational potential energy of an object of mass m raised from the surface of Earth to a height equal to the radius R of Earth is
 (a) mgR **(b) $\frac{mgR}{2}$** (c) $\frac{mgR}{3}$ (d) $\frac{mgR}{4}$
- 44) If Earth describes an orbit round the Sun of double its present radius, the year on Earth will have _____ days.
 (a) 365 **(b) 730** (c) 365 (d) 720
- 45) The value of acceleration due to gravity 'g' at a certain height h above the free surface of Earth is $x/4$ where x is the value of 'g' at the surface of Earth. The height h is
(a) R (b) $2R$ (c) $3R$ (d) $4R$
- 46) Masses of 200 kg and 800 kg are 12 cm apart. At which point from 200 kg mass the gravitational field intensity due to the two masses would be zero?
 (a) 2 cm **(b) 4 cm** (c) 6 cm (d) 8 cm
- 47) A satellite is launched in a circular orbit of radius R and another satellite is launched in circular orbit of radius $1.01R$. The time period of second satellite would be decreased by
(a) 1.5% (b) 1.05% (c) 1% (d) 3%
- 48) A satellite of mass m is revolving at a height R about the surface of Earth. Here R is the radius of the Earth. The gravitational potential energy of this satellite is
 (a) $-mgR$ **(b) $-\frac{mgR}{2}$** (c) $-\frac{mgR}{3}$ (d) $-\frac{mgR}{7}$
- 49) Which of the following graphs represents the variation of acceleration due to gravity with distance from the centre of the Earth
- (a) 

(b) 

(c) 

(d) 
- 50) From Kepler's third law, $\frac{a_1}{a_2} =$
(a) $\left(\frac{T_1}{T_2}\right)^{2/3}$ (b) $\left(\frac{T_2}{T_1}\right)^{2/3}$ (c) $(T_1 \times T_2)^{2/3}$ (d) $\left(\frac{T_1}{T_2}\right)^{3/2}$