

INTERNATIONAL INDIAN SCHOOL BURAIDAH

CLASS: XI PHYSICS WORKSHEET

Unt-7 Gravitation

1.The radius of the earth is 6400 km and $g = 10 \text{ m/s}^2$. In order that a body of 5 kg weighs zero at the equator, the angular speed of the earth is

- (a) $1/80 \text{ rad/s}$
- (b) $1/400 \text{ rad/s}$
- (c) $1/800 \text{ rad/s}$
- (d) $1/1600 \text{ rad/s}$

2.A body weighs 500 N on the surface of the earth. How much would it weight half way below the surface of the earth?

- (a) 1000 N
- (b) 500 N
- (c) 250 N
- (d) 125 N

3.The time – period of a satellite of earth is 5 hours. If the separation between the earth and the satellite is increased to 4 times the previous value, the new time – period will become

- (a) 10 hours
- (b) 20 hours
- (c) 40 hours
- (d) 80 hours

4.A missile is launched with a velocity less than the escape velocity. The sum of its kinetic and potential energy is

- (a) Positive
- (b) Negative
- (c) Zero
- (d) may be positive or negative

5.What would be the duration of the year if the distance between the earth and the sun gets doubled?

- (a) 1032 days
- (b) 129 days
- (c) 365 days
- (d) 730 days

6.If a body of mass m is taken out from a point below the surface of earth equal to half the radius of earth,

R, to a height R above the earth's surface, then work done on it will be

- (a) $(5/6) mgR$
- (b) $(6/7) mgR$
- (c) $(7/8) mgR$
- (d) $(8/9) mgR$

7. A artificial satellite moving in a circular orbit around the earth has a total (kinetic + potential) energy E_0 .

Its potential energy is

- (a) $2E_0$
- (b) E_0
- (c) $1.5 E_0$
- (d) $-E_0$

8. A body is projected vertically from the surface of the earth of radius R with velocity equal to half of the escape velocity. The maximum height reached by the body is

- (a) R
- (b) $R/2$
- (c) $R/3$
- (d) $R/4$

9. The escape velocity for a body projected vertically upwards from the surface of the earth is 11 km/s. If the body is projected at an angle of 45° with the vertical, the escape velocity will be

- (a) $11/\sqrt{2}$ km/s
- (b) $11\sqrt{2}$ km/s
- (c) 2 km/s
- (d) 11 km/s

10. There is no atmosphere on the moon because

- (a) it is closer to the earth
- (b) it revolves round the earth
- (c) it gets light from the sun
- (d) the escape velocity of gas molecules is less than their root mean square velocity here

11. The value of g at a particular point is 9.8 m/sec^2 suppose the earth suddenly shrink uniformly to half its present size without losing any mass. The value of g at the same point (assuming that the distance of the point from the centre of the earth does not shrink) will become

- (a) 9.8 m/sec^2
- (b) 4.9 m/sec^2
- (c) 19.6 m/sec^2
- (d) 2.45 m/sec^2

12. A missile is launched with a velocity less than the escape velocity. The sum of its kinetic and potential

energy is

- (a) Positive
- (b) Negative
- (c) Zero
- (d) may be positive or negative

13.If the radius of the earth were to be raise by 1% its mass remaining the same, the acceleration due to gravity on the surface of the earth will

- (a) increase by 1%
- (b) decrease by 2%
- (c) decrease by 1%
- (d) increase by 2%

14.A body is projected vertically from the surface of the earth of radius R with velocity equal to half of the escape velocity. The maximum height reached by the body is

- (a) R
- (b) $R/2$
- (c) $R/3$
- (d) $R/4$

15.The escape velocity of projection from the earth is approximately ($R = 6400$ km)

- (a) 7 km/sec
- (b) 112 km/sec
- (c) 12.2 km/sec
- (d) 1.1 km/sec

16.Who among the following first gave the experimental velocity of G ?

- (a) Cavendish
- (b) Copernicus
- (c) Brook Taylor
- (d) none of these

17.A satellite S is move in an elliptical orbit around the earth. The mass of the satellite is very small compared to the mass of the earth .

- (a) The acceleration of S is always directed towards the centre of the earth.
- (b) The angular momentum of S about the centre of the earth changes in direction, but its magnitude remains constant.
- (c) The total mechanical energy of S varies periodically with time.
- (d) The linear momentum of S remains constant in magnitude.

18.The mean radius of the earth is R , its angular speed on its own axis is ω and the acceleration due to gravity at earths surface is g . The cube of the radius of the orbit of a geo-stationary satellite will be

- (a) r^2g / w
- (b) R^2w^2/ g
- (c) $RG w^2$
- (d) R^2g / w^2

19.If the distance between the earth and the sun were half its present value, the number of day in a year would have been

- (a) 64.5
- (b) 129
- (c) 182.5
- (d) 730

20.The masses of two planets are in the ratio 1 : 2. Their radii are in the ratio 1 : 2. The acceleration due to gravity on the planets are in the ratio.

- (a) 1 : 2
- (b) 2 : 1
- (c) 3 : 5
- (d) 5 : 3