



VIDYANIKETAN COACHING CLASSES, GHANSAWANGI

Class:-10th
Sub:- Sci.&tech-1

Mark's:-25
Time:- 1:30 Hr

Q.1.A) Choose the correct alternatives

[3]

- i) A Is necessary to change the speed as well as direction of motion of an object.
A) Momentum B) Inertia C) Force D) Motion
- ii) The value of acceleration due to gravity
A) is same on equator and poles. B) is least on poles.
C) is least on equator D) is maximum at the center of the earth
- iii) The value of acceleration due to gravity at the height 'h' from the ground is....
A) $g = \frac{GM}{R+H}$ B) $g = \frac{GM}{(R+H)^2}$ C) $g = GM(R+H)$ D) None of the above

Q.1.B) Answer the following.

[2]

- i) Complete the analogy: At poles: 9.83 m/s^2 :: At equator:.....
ii) State Right or wrong. If wrong, write the correct sentence:
"Gravitational force is the strongest force in nature."

Q.2) Answer the following questions.[any-3]

[6]

- i) Define: i) Free fall ii) Centripetal force
ii) Distinguish between Mass and Weight.
iii) An object takes 5s to reach the ground from a height of 5m on a planet.
What is the value of g on the planet.
iv) State the Universal law of gravitation and derive mathematically.

Q.3) Answer the following questions.[any-3]

[9]

- i) For an object on the surface of the earth, show that: Escape velocity, $V_{\text{esc}} = \sqrt{2gr}$
ii) Explain why the value of 'g' is zero at the center of the earth.
iii) Let the period of revolution of a planet at a distance R from a star be T. prove that
if it was at distance of 2R from the star, its period of revolution will be $\sqrt{8} T$.
iv) What happen to the gravitational force between two object, if
a. the mass of one object is doubled? b. the distance between the object is doubled?
c. the mass of both the objects are doubled the distance between the object is doubled?

Q.4) Answer the following.[any-1]

[5]

- i) Define acceleration due to gravity (g) and derive an expression for it. State and explain the factors which affect the acceleration due to gravity.
ii) Write the three laws given by kepler. How did they help they help newton to arrive at the inverse square law of gravity?

Best of luck.....