CLASS : XI. M.E.S. INDIAN SCHOOL - DOHA - QATAR

IMPORTANT QUESTIONS FOR FIRST TERM EXAM

Chapter: 1 & 2 — Physical World & Measurement

1. Advantages of SI
2. Uses of dimensional analysis.
3. Limitations of dimensional analysis.
4. Convert (a) newton into dyne
   (b) dyne into newton.
   (c) joule into erg.
   (d) erg into joule.
5. Derive the following expressions dimensionally.
   (a) $T = 2\pi\sqrt{l/g}$.
   (b) $n = \frac{1}{2l}\sqrt{T/m}$.
   (c) $F = kmv^2r$.
   (d) $V = k\frac{pr^4}{l\eta}$.
6. Find out dimensions of a, b.
   (a) $\left(p + \frac{a}{V^2}\right)(V - b) = RT$
   (b) $v = a + bt$.
   (c) $x = at^2 + bt^3$.
7. Calculate % error in x.
   $x = \frac{a^2b^3}{c\sqrt{d}}$. where % error in a, b, c and d are 2%, 1%, 3% & 4% respectively
8. All error numericals are important.

chapter. 3.

Motion in 1D, 2D & 3D.

8. All the graphs given in the reader are very important.

9. Graphical method – Equations of motion.

(a). $s = ut + \frac{1}{2}at^2$

(b) $v = u + at$

(c) $v^2 = u^2 + 2as$.

10. Define relative velocity.

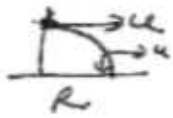
11. Numericals based on relative velocity.

12. State parallelogram law of vector addition.

Find analytically the magnitude and direction of resultant vector.

13. Resolution of vector. (Rectangular components)

14. Projectile given horizontal projection

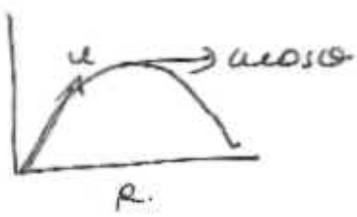


(a) S.T path of projectile parabola. $\rightarrow y = kx^2$

(b) time of flight $t = \sqrt{\frac{2h}{g}}$.

(c) Velocity of projectile. $V = \sqrt{u^2 + g^2t^2}$

15 Projectile given angular projection



(a) ST. path of projectile - parabola

$$y = x\tan\theta - \left(\frac{1}{2}\frac{g}{u^2\cos^2\theta}\right)x^2$$

(b) $T_f = \frac{2u\sin\theta}{g}$ (derivation

(c) $h_{max} = \frac{u^2\sin^2\theta}{g}$ (")

(d) $R = u^2\sin 2\theta / g$ (")

(a) $R_{max} = \frac{u^2}{g}$ when $\theta = 45°$.

16. Two angles of projection for same horizontal range. – (θ) & ($90 - \theta$) proof.

17. S.T $V = r\omega$, $a = r\alpha$

18. Derive expn for centripetal acc. $a = \frac{v^2}{r}$ & give it's direction

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Chapter : 4

Laws of Motion

1. S.T Newton's II law is the real law of motion and other laws are contained in it. (Deduce Newton I law & III law from II law)
2. Differentiate inertial mass and gravitational mass.
3. Differentiate impulse and impulsive force
4. Define impulse. S.T impulse is equal to change in momentum.
5. State and prove law of conservation of linear momentum based on
   (a) Newtons second law.
   (b) Newtons Third law
6. Recoil of a gun.
7. Differentiate inertial and non inertial frame
8. Concurrant force? conditions to be in equilibrium
9. Laws of static friction and kinetic friction.

10. Define co-efficient of static friction & kinetic friction

11. Define angle of friction. S.T $\tan\alpha = \mu_s$.

12. Define angle of repose. S.T angle of repose is equal to angle of friction

13. Comment - Friction is a necessary evil.

Chapter-5 Work, energy and power

1. Differentiate conservative & Non conservative force.

2. Define power. S.T $P = F.V$.

3. Derive expression for P.E. & Define PE (dia)

4. Define and Derive expression for K.E.

5. State & prove work energy theorem (dia)

6. State & prove law of conservation of energy. (dia & graph).

7. Differentiate elastic and inelastic collisions.

8. Obtain expression for velocities of two bodies after elastic collision in one dimension. (diagram)

9. Illustrate law of conservation of energy in an oscillating pendulum. (diagram & graph)

10. Derive an expn. for PE of a spring by using relevant diag. & graph.