



ASIA ENGLISH SCHOOL		1 st Term Exam September 2009-10
Secondary /Higher Secondary Section		Date :16-09-09
Asia Campus, Drive-in Road, Ahmedabad-380054		Time : 2 Hours
Std : XI	Sub : Physics	Total Marks : 50

Roll No. _____

Instructions :

- (1) All sections and all questions are compulsory.
- (2) Log table (or) simple calculator can be used.
- (3) Symbols used in this question paper have their usual meanings.

Question No.1 to 10 are multiple choice questions each carrying one mark. Choose correct answer and write it.

- (1) According to P.A.M. Dirac, the law of conservation of charge may be due to the _____
[a] isotropy of time [b] isotropy of space
[c] homogeneity of time [d] homogeneity of space
- (2) The quantity represented by $\frac{Mass \times Pressure}{Density}$ represents _____ or _____
[a] work, energy [b] mass, force
[c] velocity, acceleration [d] work, power
- (3) An object is projected at angle 30° with the horizontal with kinetic energy at maximum height is _____
[a] K [b] $K/2$ [c] $K/\sqrt{2}$ [d] $3K/4$
- (4) If the magnitude of gravitational acceleration is $10m/s^2$, and if the unit of length and time are taken as km and hour, than magnitude of g will be _____ km/hr^2
[a] 129600 [b] 10000 [c] 12960 [d] 1296
- (5) A force applied on a mass is represented as $F = 6i + 8j + 10k$ and acceleration produced in it is $1 ms^{-2}$. What is mass of the body ?
[a] $2\sqrt{10}kg$ [b] 10kg [c] $10\sqrt{2}kg$ [d] 20 kg.
- (6) A block of mass m is placed on a smooth inclined plane of angle θ . The force exerted by the surface of the plane on the block would be _____
[a] $mg \cos \theta$ [b] $mg/\cos \theta$
[c] mg [d] $mg \sin \theta$
- (7) The mass of a bus is 2000kg. How much work is required to be done on it to make it move with a speed of 50 km/h ?
[a] $1.6 \times 10^5 J$ [b] 193 J
[c] $1.6 \times 10^6 J$ [d] $1.93 \times 10^5 J$
- (8) If the linear momentum of a body is increased by 10%, its kinetic energy increases by _____%.
[a] 21% [b] 10% [c] 2% [d] 100%
- (9) Ns is the unit of _____
[a] Force [b] Linear momentum [c] Velocity
[d] Acceleration
- (10) In the absence of external force the acceleration of the C.M. of a system is _____
[a] Zero [b] constant [c] Variable [d] increasing only

(P.T.O.)

Question No.11 to 20 are very short answer questions. Each carrying one mark.

- (11) When do charges produced magnetic effect ?
- (12) Which uncharged particle comes out in emission of α decay from the radioactive element ?
- (13) If unit of force and distance are doubled, how many times will the unit of kinetic energy be ?
- (14) State any two ways by which velocity of the body can be changed ?
- (15) Newton's first law is nothing but the law of inertia given by Galileo. (true or False)
- (16) Give unit and dimensional formula of momentum.
- (17) A light body and heavy body have the same K.E. Which one will have a greater momentum ?
- (18) How many horse power makes one watt ?
- (19) In which condition work done on the body is negative ?
- (20) Find out an equation which relates kinetic energy with linear momentum and velocity ?

Questions NO.21 to 26 are short answer questions. Each carrying two marks.

- (21) Using dimensional analysis check the dimensional consistency of the equation $d = v_0 t + \frac{1}{2} a t^2$.
- (22) Show that a body having uniform circular motion has acceleration equal to $a_c = v^2 / r$
- (23) Prove that path of a projectile is a parabola.
- (24) Derive the formula for speed of a vehicle on a level curved road.
- (25) Write the formula for the work done when a body is brought from height y_1 to y_2 under the influence of gravitational force and derive the law of conservation of energy.
- (26) Explain the law of conservation of linear momentum with an example of explosion of chemical bomb.

Question No.27 to 32 are short answer questions. Each carrying three marks.

- (27) If $v = at + \frac{b}{t} + V_0$ is valid dimensionally then obtain the dimensional formula for a, b and c. Here v is the velocity, t is time and V_0 is initial velocity.
 - (28) A ball thrown in vertically upward direction attains maximum height of 16 m. At what height would its velocity be half of its initial velocity ?
 - (29) A stationary bomb explodes into three fragments. Two of these fragments are of equal mass and they fly off along mutually perpendicular directions with equal velocity of 30 m/s. the third fragment is 3 times heavier than each one of the other two. Find the magnitude and direction of the third one.
 - (30) Two blocks of masses 6 kg and 2kg are placed in contact on a horizontal frictionless surface. If a horizontal force of 2 N is applied to mass 6 kg, What will be the acceleration of 2 kg block ? What will be the force on this block ?
 - (31) A particle of mass m, moving with velocity \vec{v}_1 collides elastically (in two dimensions) with another particle of mass m at rest. If \vec{v}_1 and \vec{v}_2 are the velocities of the particles after the collision, show that these velocities are perpendicular to each other.
 - (32) The linear momenta of three particles, forming a system, are (1, 2, 3), (4, 5,6). The momenta are in kg $m s^{-1}$. Find the mass of the system if velocity of the C.M. is (30,39, 48) m/s.
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