HALF YEARLY EXAMINATION

SET C

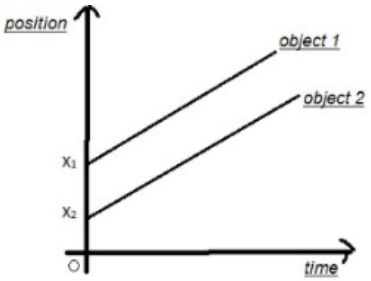
SEPTEMBER 2019

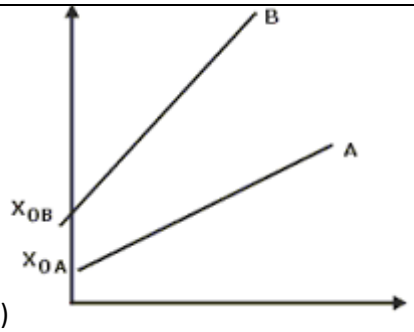
CLASS XI

Marking Scheme – SUBJECT [THEORY]

Q.NO.	Answers	Marks (with split up)
1.	(a) That ground exerts on the horse	1
2.	(c)OR (a)mark is rewarded if any of these options are written	1
3.	(a)Larger friction	1
4.	(a)zero	1
5.	(a) Impulse	1
6.	(a) 4.9cm	1
7.	(b) 100km	1
8.	(b)its acceleration is constant	1
9.	(c) 2r, πr	1
10.	(d)The particle moves at a constant velocity upto time t_0 and then stops.	1
11.	(d) 2v	1
12.	(c)90^0	1
13.	(c)Taking of an aircraft.	1
14.	(a) 55	1
15.	(b) $\sqrt{\frac{2h}{g}}$	1
16.	C 14%	1
17.	C five	1
18.	C gravitational force	1
19.	B distance	1
20.	A tension and surface tension	1
21.	(i) Statement of polygon law of vector addition. (ii) Definition of displacement vector and unit vector. OR (i) Statement of parallelogram law of vector addition. (ii) Definition of equal vector and null vector.	1 ½+1/2 1 ½+1/2
22.	Proving equation $s = ut + \frac{1}{2}at^2$ is dimensionally correct	2
23.	any two differences between inertial mass and gravitational mass.	2
24.	(i) any two properties of strong nuclear force. (ii) the relative strength of various forces in nature.	1 1

25.	Both does not represent one dimensional motion (i)speed is never negative (ii) total path length can never be negative	1/2 +1/2 ½ ½
26.	(i) In empty space there is no reaction force (ii) Reason for a cricketer moving his hands backwards while holding a catch. OR (i) Kinetic friction is less **than** static friction. (ii) rolling friction is less than sliding friction	1 1 1 1
27.	Advantages and disadvantages of friction (any 2 points each)	1+1
28.	Formula;t=10s Formula ;R=980m Formula ;v=138.57m/s OR Initial KE=1/2 mu^2 Velocity at the top=ucosθ KE at the top=1/2 $mu^2\cos^2\theta$ ¾ 1/2 mu^2 = 1/2 $mu^2\cos^2\theta$ $\cos^2\theta=3/4$ θ=30	½+1/2 ½+1/2 ½+1/2 ½ ½ ½ ½ ½
29.	Free body diagram for a vehicle moving on a banked road obtaining equation for maximum velocity required for a vehicle on a banked circular road	1 2
30.	angular velocity =π/30 rad/min Proving the vector addition is commutative.(diagram+proof)	1 1/2 +1 ½
31.	Free body diagrams for pulling and pushing and derivation	½+ ½ 1+1
32.	Proving path of a projectile is a parabola Diagram+ introduction proof	 1 2

33.	Instantaneous velocity-definition Deriving expression for distance travelled in the nth second	 1 2
34.	(i) any two advantages of SI system over other systems of units. (ii) Dimension of a = $\left[ML^{1/2}T^{-2}\right]$ Dimension of b = $\left[ML\,T^{-4}\right]$ OR (i) any two limitations of the method of dimensional analysis. (ii) Unit of b = m/s Unit of c = m/s^2	1 1 1 1 1 1
35.	(i) Obtaining an expression for centripetal acceleration of an object in uniform circular motion in a plane. (diagram and derivation) (ii) for formula the angle of projection at which the horizontal range and maximum height of a projectile are equal= 75.96^0(getting the answer) OR (i) obtaining an expression for time of flight, horizontal range and maximum height attained. (ii) getting v=288.68km/h V_y=144.34km/h	 1+2 ½+1/2 1 1+1+1 1+1
36.	(i)  (ii) Both the balls will rise to the same height. Because height attained is independent of mass of the body. (iii) velocity-time graph of uniform motion and introduction proving displacement of an object in a time interval is equal to the area under velocity-time graph in that time interval. OR	1 ½+1/2 ½+1/2 2 1

	 (i) or any relevant graph (ii)Yes. Uniform circular motion (iii) velocity-time graph of uniform motion and introduction Deriving the relation $v^2 = u^2 + 2as$ for uniformly accelerated motion of an object along a straight line.	1 1 2
37.	(i) Newton's second law of motion(Statement) Getting first law from second law Getting third law from second law (ii) a = 0.5m/s^2 v=15m/s OR (i) law of conservation of linear momentum(statement) Proof (ii) $T_1 \cos\theta = T_2$ =60N $T_1 \sin\theta =$ 50N $\tan\theta$ =5/6 Θ=39.8	1 1 1 1 1 1+2 ½+½ ½ 1/2