HALF YEARLY EXAMINATION

SEPTEMBER 2019

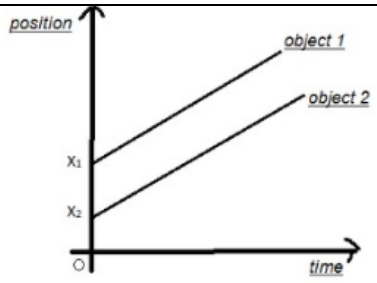
SET B

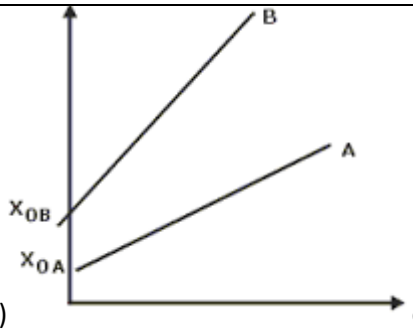
CLASS XI

Marking Scheme – SUBJECT [THEORY]

Q.NO.	Answers	Marks (with split up)
1.	C 14%	1
2.	C five	1
3.	C gravitational force	1
4.	B distance	1
5.	A tension and surface tension	1
6.	(a) That ground exerts on the horse	1
7.	(c)OR (a)mark is rewarded if any of these options are written	1
8.	(a)Larger friction	1
9.	(a)zero	1
10.	(a) Impulse	1
11.	(a) 4.9cm	1
12.	(b) 100km	1
13.	(b)its acceleration is constant	1
14.	(c) 2r, πr	1
15.	(d)The particle moves at a constant velocity upto time t_0 and then stops.	1
16.	(d) 2v	1
17.	(c)90^0	1
18.	(c)Taking of an aircraft.	1
19.	(a) 55	1
20.	(b) $\sqrt{\frac{2h}{g}}$	1
21.	Proving equation $s = ut + \frac{1}{2}at^2$ is dimensionally correct	2
22.	Random error Method to minimise	1 1
23.	(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. Definition of equal vector and null vector.	1 ½+1/2 1 ½+1/2
24.	. Figure (a) does not represent one dimensional motion of particle because the particle has two different positions at the same instant which is not the case of one dimensional motion.	½+1/2

	Graph (b) does not represent one dimensional motion because at the same instant a particle cannot have positive and negative velocity if the motion is one dimensional.	½+1/2
25.	Definition of angle of repose. Proving angle of repose = coefficient of static friction.	½ 1 ½
26.	**(i) Rolling friction is less than sliding friction** **(ii) Shockers** are **used** in **cars**, **scooters** and motorcycles so that the time interval of the jerk increases. so, the rate of momentum decreases. Hence, comparatively a lesser force is exerted on the passengers during the jerk. OR (i) When **brakes** are on, there is no rolling of **the** wheels and **the** wheels slide. **The** sliding friction is greater than **the** rolling friction. (ii) Due to buffer **spring**, the time of impact between the **bogies** increases, and the force acting between the **bogies** (F = Impulse / time) decreases. Consequently, passengers sitting inside the **bogies** do not experience strong jerks.	1 1 1 1
27.	(i) any two differences between gravitational force and electromagnetic force. (ii) four fundamental forces in the ascending order of their strength.	½+1/2 1
28.	Proving path of a projectile is a parabola Diagram+ introduction proof	 1 2
29.	Obtaining expression for acceleration of a body sliding down a rough inclined plane free body diagram. diagram	2 1
30.	(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
31.	Formula;t=10s Formula ;R=980m Formula ;v=138.57m/s OR Initial KE=1/2 mu^2 Velocity at the top=ucosθ	½+1/2 ½+1/2 ½+1/2 ½ ½

	KE at the top=1/2 $mu^2cos^2\theta$ ¾ 1/2 mu^2 = 1/2 $mu^2cos^2\theta$ $cos^2\theta$=3/4 θ=30	½ ½ ½ ½
32.	angular velocity =π/30 rad/min Proving the vector addition is commutative.(diagram+proof)	1 1/2 +1 ½
33.	Instantaneous acceleration-definition Deriving expression for distance travelled in the nth second	1 2
34.	Free body diagrams for pulling and pushing and derivation	½+ ½ 1+1
35.	(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 (iii) law of conservation of linear momentum(statement) Proof (iv) $T_1\cos\theta = T_2$ =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
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 1 ½+1/2 2

	 (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 1 2
37.	(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