

MARKING SCHEME		
Q.No.	Answer	Marks
1.	b	1
2	b	1
3	b	1
4	d	1
5	b	1
6	d	1
7	b	1
8	a	1
9	b	1
10	b	1
11	c	1
12	b	1
13	d	1
14	a	1
15	c	1
16	a	1
17	a	1
18	a	1
19	(I) Gravitational Constant- $[M^{-1}L^3T^{-2}]$ (II) Power- $[ML^2T^{-3}]$	1+1
20	(I) Instantaneous velocity at $t=2$ s Differentiation- Correct answer-39 m/s (II) Instantaneous acceleration Differentiation Correct answer-12 $m/s^2$	$\frac{1}{2}+1/2+$  $\frac{1}{2}+1/2$
21	Law of conservation of momentum Calculation Correct answer=-0.016 m/s  OR  Impulse= Change in momentum Calculation Correct Answer=-3.6 Ns Explanation of answer	$\frac{1}{2}$ 1 $\frac{1}{2}$  $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$
22	Correct Definition SI unit=N/m	1 $\frac{1}{2}$

	Dimensional formula= $[MT^{-2}]$	$\frac{1}{2}$
23	Initial KE= 800 J Final KE = 200 J Kinetic Energy reduced by= 600 J or $\frac{3}{4}$ of original value	$\frac{1}{2}$ $\frac{1}{2}$ 1
24	Correct Definition Correct explanation of factors	1 1
25	Formula - $V_{cm} = (m_1 v_1 + m_2 v_2) / (m_1 + m_2)$ Correct Calculation Correct Answer= $v/2$	$\frac{1}{2}$ 1 $\frac{1}{2}$
26	Velocity $v = K \lambda^a \rho^b g^c$ . Correct equations- $b=0$ , $a-3b+c=1$ , $-2c=-1$ Correct values of a, b and c- $a=1/2$ , $b=0$ , $c=1/2$ Correct Formula- $v = K(\lambda g)^{1/2}$	$\frac{1}{2}$ $1+1/2$ $\frac{1}{2}$ $\frac{1}{2}$
27	Graph Correct Equations	$\frac{1}{2}$ $\frac{1}{2}+1+1$
28	For correct deduction and explanation of first and third law OR Correct figure Calculation for resultant force Magnitude of acceleration= $2 \text{ m/s}^2$ Angle between resultant and 8 N force $\theta = \cos^{-1}(0.8)$	$1 \frac{1}{2} + 1 \frac{1}{2}$ $\frac{1}{2}$ $\frac{1}{2}$ 1 1
29	Deduction of relation between torque and angular momentum. Correct Answer, Torque= $-8i-2j-10k$ OR Correct Definition SI unit Dimension For correct explanation of physical significance	2 1  1 $\frac{1}{2}$ $\frac{1}{2}$ 1
30	Correct calculation of mass of original plate Correct calculation of mass of circular portion removed Correct position of center of mass of remaining portion=9 cm	1 1 1

31	(a) Figure Correct derivation of trajectory of projectile (b) Correct proof <p style="text-align: center;"><b>OR</b></p> (a) Correct Definition Correct Derivation (b) Correct Calculation Correct answer = $a_c = 2368.8 \text{ m/s}^2$	1 2 2  1 2 1 1
32	(a) Correct definition of the terms static friction, limiting friction and kinetic friction. Correct graph (b) Correct Calculation Correct answer – maximum acceleration = $1.5 \text{ m/s}^2$ <p style="text-align: center;"><b>OR</b></p> (a) Meaning of banking of road? Correct derivation and writing of expression for optimum velocity (b) correct formula $f = \mu mg = mv^2/r$ Correct answer $v = 28 \text{ m/s}$	$\frac{1}{2} + 1/2 + \frac{1}{2}$ $1 \frac{1}{2}$ $1 \frac{1}{2}$ $\frac{1}{2}$  1 2 1 1
33	(a) correct statement Correct proof (b) $mgh = mv^2/2$ $h = 20.2 \text{ m}$ <p style="text-align: center;"><b>OR</b></p> (a) Correct Definition Correct derivation for final velocities (b) Correct calculation Correct outcomes $v_1 = -v$ , $v_2 = +v$	1 2 1 1  1 2 1 1
34	(I) b (II) a (III) a (IV) b	1 1 1 1
35	(I) c (II) d (III) a (IV) b	1 1 1 1