INDIAN SCHOOL AL WADI AL KABIR
CLASS XI
PHYSICS
ASSESSMENT 1 (2025 - 26)
ANSWER KEY

Q.NO.	ANSWERS	MARKS
1	(A) Dimensionally consistent equations are always physically correct.	1
2	(A) 1-C, 2-D, 3-A, 4-B	1
3	(B)Has dimensions T^{-2}	1
4	(A)1 and 3 only	1
5	(B)100 m	1
6	(D)Greater than or equal to the magnitude of the displacement.	1
7	$(A)\ \tan\theta = \frac{A_y}{A_x}$	1
8	(C)Towards the center of the circular path of motion.	1
9	(D)Equilibrium : Net external force is zero	1
10	(A)2000 N	1
11	(C)Work is done in lifting the weight but no work is required to be done in holding up.	1
12	(B)Less than that of bullet.	1
13	(C)Assertion is true but Reason is false.	1
14	(A) Both Assertion and Reason are true and Reason is the correct explanation of Assertion.	1
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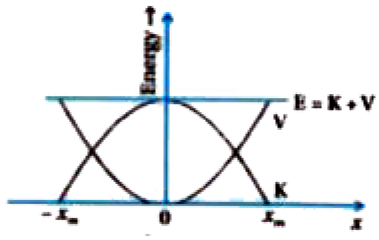
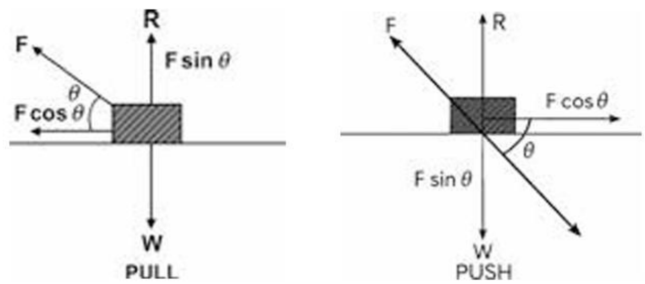
16	(A)Both Assertion and Reason are true and Reason is the correct explanation of Assertion.	1
17	$[a\sqrt{x}] = [F]$ $\therefore [a] = \frac{[F]}{[\sqrt{x}]} = \frac{MLT^{-2}}{L^{1/2}} = ML^{1/2}T^{-2}$ $[bt^2] = [F]$ $\therefore [b] = \frac{[F]}{[t^2]} = \frac{MLT^{-2}}{T^2}$ $= MLT^{-4}$ $[ab] = [M^2L^{3/2}T^{-6}]$	½ ½ ½ ½
18	(a) Statement (b) Magnitude = √2 Direction, tan Θ = 1/1 =1 Θ = 45°	1 ½ ½

19	a)  b) Force per unit length. SI unit N/m	1 ½ + ½
20	a) $a=1.8\ m/s^2$ T = m (g+a) =17400 N b) a=0 T = mg = 14700 N OR (i) f = μN f = 117.6 N (ii) f = μN Net force = 19.6 N $a=0.98\ m/s^2$	½ ½ ½ ½ ½ ½ ½ ½
21	Consideration/ diagram $V^2 – u^2 = 2as$ $½\ mv^2 – ½\ m\ u^2 = mas$ = Fs= W W = change in K.E. OR Consideration/diagram $W = \int_0^{x_m} F dx$ F = kx $W = ½\ kx^2$ $U = ½\ k\ x^2$	½ ½ ½ ½ ½ ½ ½ ½
22	$v\ \alpha\ F^a\ l^b\ m^c$ $v = k\ F^a\ l^b\ m^c$ Force F has dimensions $[F] = MLT^{-2}$ Length l has dimensions $[l] = L$ Mass m has dimensions $[m] = M$ Velocity v has dimensions $[v] = LT^{-1}$ a = ½ b=1/2 c= -1/2 v =k√Fl/m	½ ½ ½ ½ ½ ½

23	Graph equation for x components equation for y components final expression	1 ½ ½ 1
24	Diagram Steps Final answer	1 1 ½ +1/2
25	Statement Fα rate of change of momentum F = k rate of change of momentum F = K $\frac{dp}{dt}$ $F = K\,ma$, If K=1 F = ma	1 ½ ½ ½ ½
26	Diagram  Necessary equations R = W – FsinΘ R = W + FsinΘ Explanation	½ +1/2 ½ ½ 1
27	h=1/2 gt^2 Distance covered by 1st body in 3 s = 45 m Height of the 1st body above the ground = 150 – 45 = 105 m Distance covered by 2nd body in 3 s = 45 m Height of the 2nd body above the ground = 100 – 45 = 55 m Difference in the height = 105-55 = 50 m OR S = ut +1/2 at^2 (i) s = 1960 m	½ ½ ½ ½ ½ ½ ½ 1

	(ii) s = 960 m	1

28	Statement Proof (any 2)	1 1 each
29	(I)(B)22000 N (II)(B)44000 W (III) (C)The cable tension exceeds the elevator's weight (IV) (B)Power required doubles	1 1 1 1
30	(I) F = ma F = 150 N a=150/2 = 75 m/s^2 direction towards east (II) Winning or losing depends on the net external forces acting on each team, mainly due to friction between the team members' feet and the ground. (III) Any example with explanation	½ ½ ½ ½ 1 ½ + ½
31	a) Graph Area under the graph gives displacement Steps Final answer Velocity of car from $A = \frac{480}{8} = 60 \,/\, hour$ Distance travelled from $A = 60t$velocity of car from $B = \frac{480}{12} = 40km \,/\, hour$ Distance travelled from $B = 42t$ Let the two cars meet at t hour then $60t + 40t = 480km$ $\therefore T = \frac{480}{60+40} = 4.8 = hours$ the distance $s = v_A \times t = 60 \times 4.8 = 288km.$ b) **OR** a)Graph	1 ½ ½ ½ ½ ½ ½ ½ ½ 1 ½

	Area under the graph gives displacement Steps Final answer b) Area under the graph = 40 m (for 7 s) Area = 10 m (for 2 s) Fraction = 10/40 = 1/4	½ ½ ½ 1 ½ ½
32	a) Graph Time of flight expression Horizontal range expression b) h = ½ gt^2 = 2 s R = vt =19.6/2 = 9.8 m/s OR a) Definition Diagram Steps Final expression b) Using $a_c = \frac{v^2}{r}$, solve for v: $v = \sqrt{a_c \times r} = \sqrt{25 \times 1.2} = \sqrt{30} \approx 5.48\, m/s$ Angular speed ω is related to linear speed by $v = \omega r$: $\omega = \frac{v}{r} = \frac{5.48}{1.2} \approx 4.57\,\text{rad/s}$	1 1 1 ½ +1/2 ½ + ½ 1 1 ½ ½ ½ ½ ½ ½
33	a) Diagram N=W f=mv^2/R v = √μRg b) a=v^2/r = 11.25 m/s^2 F=f ma =μN = μmg μ = 1.15 c) Any two methods OR a) Diagram	½ ½ ½ ½ ½ ½ ½ ½ ½ +1/2 1

	$N\cos\Theta = W + f\sin\Theta$ $N = mg/(\cos\Theta - \mu\sin\Theta)$ $N\sin\Theta + f\cos\Theta = mv^2/R$ $v = \sqrt{\frac{Rg(sin\theta + \mu\cos\theta)}{\cos\theta - \mu\sin\theta}}$ b) $V = \sqrt{rg}\tan\Theta = 36.86$ m/s	½ ½ ½ ½ 1 1