

SECOND TERMINAL EXAMINATION-2011

ANSWER KEY- PHYSICS I

Q. No	Scoring Indicators	Split Score	Total Score
1	Applying homogeneity of dimensions $[ct^2]=[L]$ $[c]=[LT^{-2}]$ So unit is ms^{-2}	1	1
2	a) Pressure=Energy per unit volume c) Pressure=Force per unit area	$\frac{1}{2} \times 2$	1
3	Four	1	1
4	a) Change in velocity between 0.75h and 1h= $40kmh^{-1}$ Acceleration= $\frac{40}{0.25} = 160kmh^{-1}$ b) Distance covered= Area of the velocity time graph $=\frac{1}{2} (60+20) 0.25$ $=10km$	1 2	3
5	a) Explanation of resolution of vectors b) For maximum, $R = \sqrt{A^2 + B^2 + 2AB \cos \theta}$ $\cos \theta$ is maximum when \cos is 1 For minimum, \cos is minimum when \cos is -1	1 1+1	3
6	a) Statement of law of inertia b) , when force is doubled, the acceleration also doubled c) $m_1u_1 + m_2u_2 = m_1v_1 + m_2v_2$ $5 \times 4 + 2 \times 2 = 7v$ $v = 3.4ms^{-1}$	1 1 2	4
7	a) Explanation of banking of road b) Derivation of safe speed	1 2	3
8	a) Statement of work-energy theorem b) Proof of principle conservation of energy c) Graphical representation (NCERT text book page no. 124) d) $KE = \frac{1}{2}mv^2 = \frac{1}{2} \frac{m^2v^2}{m} = \frac{p^2}{2m}$ momentum p is a constant $KE \propto \frac{1}{m} \therefore$ light body has greater KE	1 2 1 1	5
9	a) Distinguish between elastic and inelastic collisions (any four) b) Explanation of elastic collision in one dimension c) Problem- NCERT text book page no 131	2 2 2	6

$$\frac{\theta \cdot \theta \cdot \theta}{a} = \frac{F \cdot D \cdot 80}{m}$$

Q. No	Scoring Indicators	Split Score	Total Score
16	a) definition of terminal velocity b) derivation of terminal velocity $V_t = \frac{2r^2g(\rho - \sigma)}{9\eta}$	1 2	3
17	a) $p = h\rho g$, 'h' of heart feet is greater than that at heart brain b) for small drops, potential energy is due to surface tension alone and not due to gravity so PE and surface area gets minimum. Sphere has least surface area and drop takes the spherical shape	1 1	2
18	a) Distinguish between heat and temperature b)	1 4 x 1/2	3
19	a) In the range 0°C to 4°C, water contracts on heating (also expands on cooling) b) Triple point of water is the temperature at which all the three states of matter (Solid, liquid and gas) co-exists	1 1	2

$$\frac{C}{100} = \frac{F - 32}{180} = \frac{K - 273}{100}$$