

Quarterly Examination - 2018XI PhysicsAnswer and scoring key.I. Choose the correct answer:-

(15 x 1 = 15)

1. (c) rad s^{-2}
2. (a) 273.16K
3. (c) 9.86
4. (d) both a and b
5. (a) 1m s^{-2}
6. (b) $g \text{ m s}^{-1}$.
7. (b) Force and motion in different direction
8. (a) Inertia of direction
9. (d) $\mu s \text{ mg} \cos\theta$
10. (b) Zero
11. (c) $3.6 \times 10^6 \text{ J}$
12. (c) $e = 1$
13. (c) $2V/\sqrt{3}$
14. (c) $F = Bx$
15. (c) no force acts on the object.

II. section - II

16. (a) Coherent system of unit
- (b) permanent and reproducible - any two points - 2m

17. Correct definition - 2m

18. Correct definition - 2m

19. (i) $\theta = 45^\circ$ - $\frac{1}{2}$ m

(ii) $R_{\max} = \frac{u^2}{2g}$ - $\frac{1}{2}$ m

(iii) $R_{\max} = \frac{98 \times 98 \times 10}{2 \times 9.8 \times 10}$ - $\frac{1}{2}$ m

$= \frac{980}{2} = 490 \text{ m} - \frac{1}{2} \text{ m}$

20. (i) Correct statement - 2m

(OR)
(writing formula $T = \frac{2\pi}{g} = \frac{1}{2} \text{ m}$)

21. (i) Correct statement - 2m

(OR)

$\frac{|\vec{F}_1|}{\sin \alpha} = \frac{|\vec{F}_2|}{\sin \beta} = \frac{|\vec{F}_3|}{\sin \gamma} \Rightarrow \frac{1}{2}$

22. (i) Correct definition - 1m

(ii) Dimensional formula (ML^2T^{-3}) - 1m

23. (i) Any two points - 2m

24. (i) If $\frac{mv^2}{r} < \mu_s mg$, or

$\mu_s \geq \frac{v^2}{rg}$ or $\sqrt{\mu_s rg} \geq v$ - 2m

SECTION - III

25. (i) Writing dimensions for } - 1m
h, c and G

(ii) $\frac{[ML^2T^{-1}][LT^{-1}]}{[M^1L^3T^{-2}]} = 1 \text{ m}$

$= [M^2] - 1 \text{ m}$

26. Any six rules - 3m
27. (i) Any two eqns. - $1\frac{1}{2} + 1\frac{1}{2}$ marks
28. (i) Yes - 1m
- (ii) Explanation - 2m
29. (i) FBD -
- (ii) Writing forces acting on the mango $\frac{1m}{2}$ - 1m
- (iii) $\vec{F}_s = mg(-\hat{j}) = -mg\hat{j}$
 $\vec{T} = T\hat{j}$ } - $\frac{1}{2}$ m
- (iv) $\vec{F}_{net} = (T - mg)\hat{j} = 0$ - $\frac{1}{2}$ m
- (v) $T = 0.4 \times 9.8 = 3.92 \text{ N}$ - $\frac{1}{2}$ m
30. (i) Correct definition - 2m
- (ii) $C.F = \frac{mv^2}{r}$ - 1m
31. (i) $W = F \cdot ds \cdot \cos\theta$ - 1m
- (ii) $W = 25 \times 15 \times \cos 30^\circ$ - $\frac{1}{2}$ m
- $= 25 \times 15 \times \frac{\sqrt{3}}{2}$ - $\frac{1}{2}$ m
- $= 324.76 \text{ J}$ - 1m
32. (i) correct definition - 3m
33. (i) Any six properties - 3m

SECTION-IV

34 (a) Three applns - 3m

(b) Verification of $s = ut + \frac{1}{2}at^2$ } - 2m (OR)

(i) definition - 1m

(ii) Propagation of errors in addition and multiplication } - 1+1 = 2m

(iii) $Q = \frac{2^2 y^3}{z}$

$$= 2 \frac{\Delta x}{x} \times 100 + 3 \frac{\Delta y}{y} \times 100 + \frac{\Delta z}{z} \times 100 - 1m$$

$$= 2 \times 2 \% + 3 \times 3 \% + 1 \% = 14 \% - 1m$$

35. (a) (i) triangle law - 1m

(ii) Diagram - 1m

(iii) upto $R = \sqrt{A^2 + B^2 + 2AB \cos \theta}$ - 2m

(iv) upto $\theta = \tan^{-1} \left(\frac{B \sin \theta}{A + B \cos \theta} \right)$ - 1m (OR)

(b) (i) Explanation - 1m

(ii) Diagram - 1m

(iii) Forces action of the object and derivation } - 3m

35. (a) (i) Triangulation method - 2 1/2 m

(ii) Radar method - 2 1/2 m (OR)

(b) (i) Conservation of momentum and Conservation of K.E } - 1m

(ii) Introduction and diagram - 1m

(ii) upto $v_2 - v_1 = \frac{1}{2}m$

(iii) upto $v_2 = \frac{2m_1 u_1}{m_1 + m_2} + \frac{(m_2 - m_1) u_2}{m_1 + m_2} = 1m$

(iv) $v_1 = \frac{(m_1 - m_2) u_1}{m_1 + m_2} + \frac{2m_2 u_2}{m_1 + m_2} = \frac{1}{2}m.$

37. (a) (i) Introduction — 1m

(ii) Diagram — 1m

(iii) upto $t = \frac{x}{u \cos \theta}$ — 1m

(iv) upto $y = u \sin \theta t - \frac{1}{2}gt^2 = 1m$

(v) upto $y = x \tan \theta - \frac{1}{2}g \frac{x^2}{u^2 \cos^2 \theta} = 1m$ (OR)

(b) Comparison each five points — 5m

38. (a) (i) Three laws — 3m

(ii) Explanation — 2m (OR)

(b) (i) Principle — 1m

(ii) upto $F = ma$ — 1m

(iii) Finding $a = \frac{v^2 - u^2}{2s}$ — 1m

(iv) upto $W = \frac{1}{2}mv^2 - \frac{1}{2}mu^2 = 1m$

(v) upto $W = \Delta KE = 1m.$

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