

BOARD OF INTERMEDIATE EDUCATION (AP)

HALF YEARLY EXAMINATIONS - 2021

JUNIOR INTER PHYSICS

MODEL PAPER (English Version)

Time: 3 Hours

Max.Marks: 60

SECTION - A

Note: i) Very short answer type questions.

10 × 2 = 20

ii) Answer All questions.

iii) Each question carries 2 marks.

1. What is the discovery of C.V. Raman?
2. What are the fundamental forces in nature?
3. Distinguish between accuracy and precision.
4. The percentage error in the mass and speed are 2% and 3% respectively. What is the maximum error in Kinetic energy calculated using these quantities?
5. If $\vec{A} = \vec{i} + \vec{j}$, what is the angle between vector \vec{A} with X – axis?
6. What is the acceleration of a projectile at the top of its trajectory?
7. Can the coefficient of friction be greater than one?
8. A horse has to exert a greater force during the start of the motion than later. Explain.
9. What is the length of a Simple Pendulum, which ticks second?
10. Give two examples for Vector Product.

SECTION - B

Note: i) Short answer type questions.

6 × 4 = 24

ii) Answer any six questions.

iii) Each question carries 4 marks.

11. A car travels the first third of a distance with a speed of 10 kmph, the second third at 20 kmph and the last third at 60 kmph. What is its mean speed over the entire distance?
12. Show that the trajectory of an object thrown at a certain angle with the horizontal is a parabola.
13. If θ is angle of projection, R – the range, h – the maximum height, T – the time of flight then show that
a) $\tan\theta = \frac{4h}{R}$ b) $h = \frac{gT^2}{8}$
14. Explain the advantages and disadvantages of friction.
15. State the laws of Rolling friction.
16. Define angular velocity (ω). Derive $v = r\omega$.
17. State and prove the principal of conservation of angular momentum. Explain this with examples.

18. Find the torque of a force $7\vec{i} + 3\vec{j} - 5\vec{k}$ about the origin. The force acts on a particle whose position vector is $\vec{i} - \vec{j} + \vec{k}$.

SECTION - C

Note: i) Long answer type questions.

$2 \times 8 = 16$

ii) Answer any two questions.

iii) Each question carries 8 marks.

19. a) Develop the notions of work and kinetic energy and show that it leads to Work – Energy theorem.
b) A machine gun fires 360 bullets per minute and each bullet travels with a velocity of 600 ms^{-1} . If the mass of each bullet is 5 gm, find the power of the machine gun.
20. Show that the motion of a simple pendulum is simple harmonic and hence derive an equation for its time period. What is seconds pendulum?
21. State and prove law of conservation of energy in case of freely falling body.

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