

Online Offline JEE Main 2024 Solved Papers: Your Ultimate Guide to Exam Success

[3] VIDYALANKAR : JEE-MAIN 2015 : Paper and Solution

Questions and Solutions

PART - A : PHYSICS

1. Two stones are thrown up simultaneously from the edge of a cliff 240 m high with initial speed of 40 m/s and 30 m/s respectively. Which of the following graphs best represents the time variation of relative position of the second stone with respect to the first? (Assume stones do not rebound after hitting the ground and neglect air resistance, take $g = 10 \text{ m/s}^2$). (The figures are schematic and not drawn to scale)

(1)

(2)

(3)

(4)

For the second stone time required to reach the ground is given by

$$-240 = 40t - \frac{1}{2} \times 10 \times t^2$$

$$5t^2 - 40t - 240 = 0$$

$$t = 12 \text{ s}$$

For the first stone

$$240 = 30t - \frac{1}{2} \times 10 \times t^2$$

$$5t^2 - 30t - 240 = 0$$

$$t^2 - 6t - 48 = 0$$

$$(t - 8)(t + 6) = 0$$

$$t = 8 \text{ s}$$

During time t both the stones are in air

$$y_2 - y_1 = (40t - 5t^2) - (30t - 5t^2)$$

Graph of $(y_2 - y_1)$ against t is a straight line

After 8 seconds

$$y_2 = 40 \times 8 - \frac{1}{2} \times 10 \times 8^2 - 240$$

Stones have same acceleration with respect to time since. Hence graph (3) is the correct description

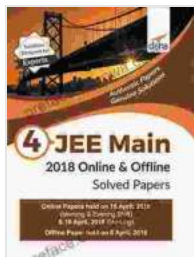
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4 Online & Offline JEE MAIN 2024 Solved Papers

by Disha Experts

★★★★★ 5 out of 5

Language : English



File size : 6829 KB
Print length : 9 pages
Screen Reader: Supported



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Online Offline JEE Main 2024 Solved Papers is a comprehensive resource for students preparing for the Joint Entrance Examination (JEE) Main 2024. This book provides chapter-wise and topic-wise solutions to the official JEE Main papers from 2019 to 2023. With a vast collection of solved papers, students can practice and master the concepts tested in the exam.

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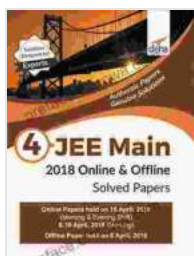
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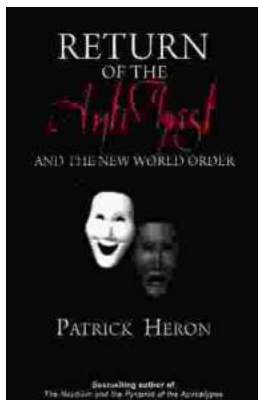
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