YEAR 11 | PHYSICS

Student practice paper

Name: _____ Date: _____

Suggested time: 60-75 minutes. Show reasoning and use evidence where appropriate. Questions are original and intended for MYP 5 / pre-DP preparation.

Section A - Motion and forces (22 marks)

1. A runner travels 240 m in 30 s. Calculate average speed. [3]

2. A car accelerates uniformly from 4 m/s to 20 m/s in 8 s. Find acceleration. [4]

3. A 2.5 kg trolley accelerates at 3 m/s². Calculate resultant force. [3]

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4. Explain the difference between mass and weight. Find weight of a 60 kg person when g = 9.8 N/kg. [6]

5. Describe how distance-time and velocity-time graph gradients differ in meaning. [6]

Section B - Energy and electricity (22 marks)

6. A 3 kg object is raised 2 m. Calculate gain in gravitational potential energy (g = 9.8 N/kg). [4]

7. A device takes 500 J of input energy and delivers 350 J useful energy. Calculate efficiency. [4]

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8. A 12 V supply is connected to a 4 ohm resistor. Find current. [4]

9. Two resistors of 3 ohms and 6 ohms are connected in series. Find total resistance and current with an 18 V battery. [5]

10. Explain energy transfers in a falling ball before it hits the ground, including non-useful pathways. [5]

Section C - Waves and experimental reasoning (16 marks)

11. A wave has frequency 50 Hz and wavelength 0.4 m. Calculate its speed. [4]

12. Compare transverse and longitudinal waves and give one example of each. [4]

13. Design an experiment to determine how pendulum length affects period. Include variables, repeated measurements and how to reduce error. [8]

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ANSWER KEY & TUTOR GUIDANCE

Physics

The following pages contain suggested answers, marking points and tutor guidance. For open-ended tasks, answers are indicative rather than the only acceptable responses.

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Tutor answer and marking guide

Worked answers

1: 240/30 = 8 m/s. [3]

2: (20 - 4)/8 = 2 m/s². [4]

3: F = ma = 2.5 x 3 = 7.5 N. [3]

4: Mass is amount of matter measured in kg; weight is gravitational force measured in N; W = 60 x 9.8 = 588 N. [6]

5: Distance-time gradient is speed; velocity-time gradient is acceleration. [6]

6: E = mgh = 3 x 9.8 x 2 = 58.8 J. [4]

7: 350/500 x 100 = 70%. [4]

8: I = V/R = 12/4 = 3 A. [4]

9: Rtotal = 3 + 6 = 9 ohms; I = 18/9 = 2 A. [5]

10: Gravitational potential energy transfers to kinetic; some dissipates as thermal energy and sound through air resistance. [5]

11: v = f lambda = 50 x 0.4 = 20 m/s. [4]

12: Transverse oscillations perpendicular to direction of travel (light); longitudinal oscillations parallel (sound in air). [4]

13: Change string length, control bob mass and release angle, time 10 oscillations repeatedly and divide by 10, average and plot period against length; avoid parallax and use small amplitude. [8]

Tutor notes

Award working and units; distinguish scalar speed from vector velocity. Total 60 marks.

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