

© International Baccalaureate Organization 2026

All rights reserved. No part of this product may be reproduced in any form or by any electronic or mechanical means, including information storage and retrieval systems, without the prior written permission from the IB. Additionally, the license tied with this product prohibits use of any selected files or extracts from this product. Use by third parties, including but not limited to publishers, private teachers, tutoring or study services, preparatory schools, vendors operating curriculum mapping services or teacher resource digital platforms and app developers, whether fee-covered or not, is prohibited and is a criminal offense.

More information on how to request written permission in the form of a license can be obtained from <https://ibo.org/become-an-ib-school/ib-publishing/licensing/applying-for-a-license/>.

© Organisation du Baccalauréat International 2026

Tous droits réservés. Aucune partie de ce produit ne peut être reproduite sous quelque forme ni par quelque moyen que ce soit, électronique ou mécanique, y compris des systèmes de stockage et de récupération d'informations, sans l'autorisation écrite préalable de l'IB. De plus, la licence associée à ce produit interdit toute utilisation de tout fichier ou extrait sélectionné dans ce produit. L'utilisation par des tiers, y compris, sans toutefois s'y limiter, des éditeurs, des professeurs particuliers, des services de tutorat ou d'aide aux études, des établissements de préparation à l'enseignement supérieur, des fournisseurs de services de planification des programmes d'études, des gestionnaires de plateformes pédagogiques en ligne, et des développeurs d'applications, moyennant paiement ou non, est interdite et constitue une infraction pénale.

Pour plus d'informations sur la procédure à suivre pour obtenir une autorisation écrite sous la forme d'une licence, rendez-vous à l'adresse <https://ibo.org/become-an-ib-school/ib-publishing/licensing/applying-for-a-license/>.

© Organización del Bachillerato Internacional, 2026

Todos los derechos reservados. No se podrá reproducir ninguna parte de este producto de ninguna forma ni por ningún medio electrónico o mecánico, incluidos los sistemas de almacenamiento y recuperación de información, sin la previa autorización por escrito del IB. Además, la licencia vinculada a este producto prohíbe el uso de todo archivo o fragmento seleccionado de este producto. El uso por parte de terceros —lo que incluye, a título enunciativo, editoriales, profesores particulares, servicios de apoyo académico o ayuda para el estudio, colegios preparatorios, desarrolladores de aplicaciones y entidades que presten servicios de planificación curricular u ofrezcan recursos para docentes mediante plataformas digitales—, ya sea incluido en tasas o no, está prohibido y constituye un delito.

En este enlace encontrará más información sobre cómo solicitar una autorización por escrito en forma de licencia: <https://ibo.org/become-an-ib-school/ib-publishing/licensing/applying-for-a-license/>.

Physics

Standard level

Paper 1A

28 April 2026

Zone A afternoon | **Zone B** afternoon | **Zone C** afternoon

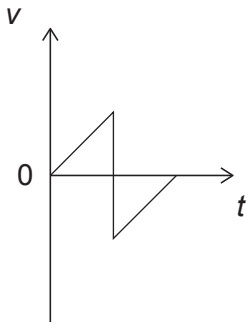
1 hour 30 minutes [Paper 1A and Paper 1B]

Instructions to students

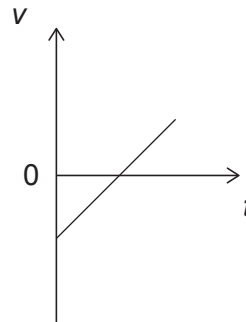
- Do not open this examination paper until instructed to do so.
- Answer all questions.
- For each question, choose the answer you consider to be the best and indicate your choice on the answer sheet provided.
- A calculator is required for this paper.
- A clean copy of the **physics data booklet** is required for this paper.
- The maximum mark for paper 1A is **[25 marks]**.
- The maximum mark for paper 1A and paper 1B is **[45 marks]**.

1. A ball is dropped from rest. The ball hits the ground and bounces back up. Which of the following diagrams shows the variation with time t of the velocity v of the ball?

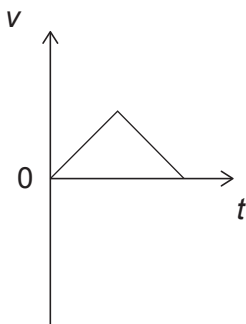
A.



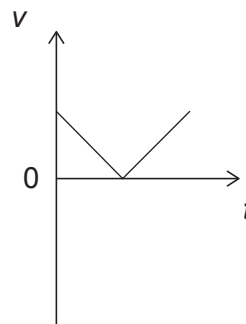
B.



C.



D.



2. A balloon of mass m falls vertically through the air with terminal velocity. The buoyancy force acting on the balloon has magnitude F_b . What is the magnitude of the drag force acting on the balloon?

A. mg

B. F_b

C. $mg + F_b$

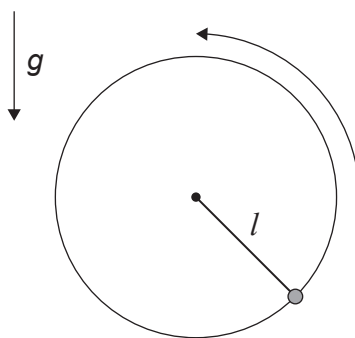
D. $mg - F_b$

3. A ball of mass 0.0030 kg is fired with a speed of 10 m s^{-1} from a toy gun of mass 0.60 kg , which is initially stationary. The net external force on the system is zero.

What are the impulse on the gun and the total momentum of the system just after it is fired?

	Impulse on the gun/ N s	Total momentum of the system/ kg m s^{-1}
A.	0.03	0.57
B.	0.03	0
C.	6	0.57
D.	6	0

4. A child ties a stone to a string of length l and swings it in a vertical circle. The stone has speed v at the highest point on the circle.



What is the minimum possible value of v for the string to remain taut?

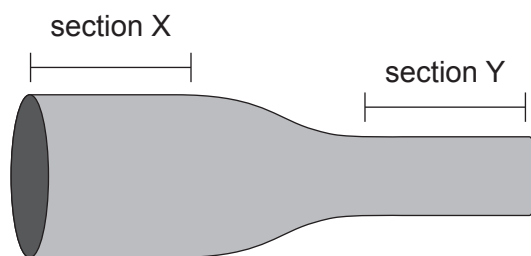
- A. $\sqrt{gl}$
- B. $\sqrt{2gl}$
- C. $\frac{g}{l^2}$
- D. $\frac{l^2}{g}$

5. A car moves up a hill with initial kinetic energy K . W is the work done on the car by the net force in reaching the top of the hill. The change in gravitational potential energy of the car is U . What is the kinetic energy of the car at the top of the hill?
- A. K
 - B. $K - U$
 - C. $K + W$
 - D. $K + W - U$
6. An amount of energy E can be extracted from a mass m of fuel with volume V . What is the energy density of the fuel?
- A. $\frac{E}{m}$
 - B. $\frac{E}{V}$
 - C. $\frac{Em}{V}$
 - D. $\frac{EV}{m}$
7. Thermal energy is transferred to a gas inside a container of fixed volume and initial temperature 20°C . As a result, the pressure inside the container is doubled. What is the final temperature of the gas?
- A. 40°C
 - B. 293°C
 - C. 313°C
 - D. 586°C

8. A planet with an albedo of 0.2 orbits the Sun in a circular orbit. The solar constant at the position of the planet is S . The planet has no atmosphere and a constant temperature. What is the **average** intensity radiated by the planet's surface?
- A. $0.05S$
- B. $0.08S$
- C. $0.2S$
- D. $0.8S$
9. An ideal gas X at temperature T has internal energy U . A second ideal gas Y at temperature $2T$ has internal energy $\frac{U}{2}$. Which gas has more particles and what is the direction of heat flow between the gases once they are put into thermal contact?

	Gas with more particles	Direction of heat flow
A.	X	X to Y
B.	Y	X to Y
C.	X	Y to X
D.	Y	Y to X

10. A current-carrying wire has two sections with different radii.



The radius of the wire in section X is twice that in section Y. The current in X is I_x and the current in Y is I_y . What is $\frac{I_x}{I_y}$?

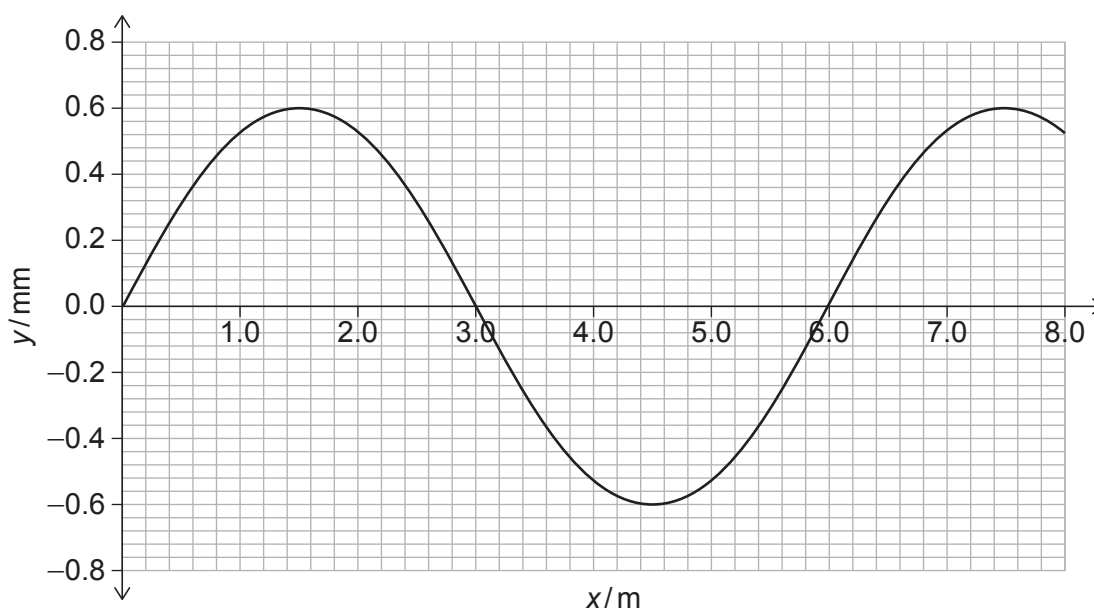
- A. $\frac{1}{2}$
 - B. 1
 - C. 2
 - D. 4
11. A potential difference across a wire of length L dissipates 1000 W. A second wire of the same material and diameter has length $\frac{L}{2}$. What is the power dissipated in the second wire with the same potential difference across it?
- A. 250 W
 - B. 500 W
 - C. 2000 W
 - D. 4000 W

12. A simple pendulum of length 10 m is released from rest at time $t = 0$, at a small angle from the vertical. At what value of t , in seconds, will the pendulum reach its maximum speed?

- A. $\frac{\pi}{4}$
- B. $\frac{\pi}{2}$
- C. π
- D. 2π

13. A sound wave travels through the air to the right. The graph shows the variation of the displacement y of air molecules with position x along the wave at time $t = 0$.

Positive values represent displacements to the right and negative values represent displacements to the left.



Where will the compression be at $t = 0$?

- A. 1.5 m
- B. 3.0 m
- C. 4.5 m
- D. 6.0 m

14. Two identical sources emit sound of wavelength L in phase. The sources are separated by a distance equal to L .



How many points of destructive interference are there on the line joining the sources?

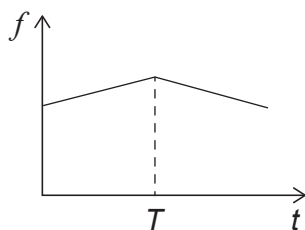
- A. None
- B. One
- C. Two
- D. Infinite
15. A first harmonic standing wave is formed in a pipe with one end open and one end closed. What is the phase difference between the middle point of the pipe and its open end?
- A. 0
- B. $\frac{\pi}{4}$
- C. $\frac{\pi}{2}$
- D. π

16. An observer moves with constant speed towards and then past a stationary sound source.

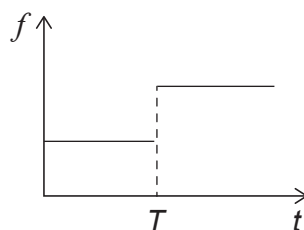


The speed of the observer is less than the speed of sound. At time T , the observer passes the source and starts moving away from it. Which graph shows how the frequency f measured by the observer varies with time t ?

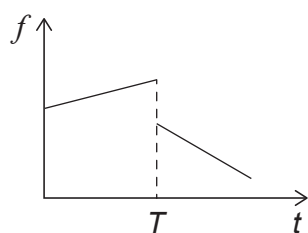
A.



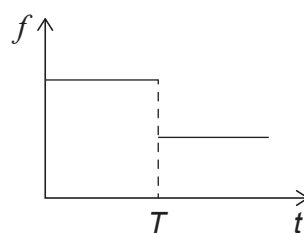
B.



C.



D.



17. A planet has two moons, X and Y, orbiting it in circular orbits. Moon X has a mass m and an orbital radius R . Moon Y has mass $2m$ and orbital radius $\frac{R}{2}$. What is the ratio between the centripetal force acting on X and the centripetal force acting on Y?

- A. $\frac{1}{8}$
- B. $\frac{1}{4}$
- C. $\frac{1}{2}$
- D. 1

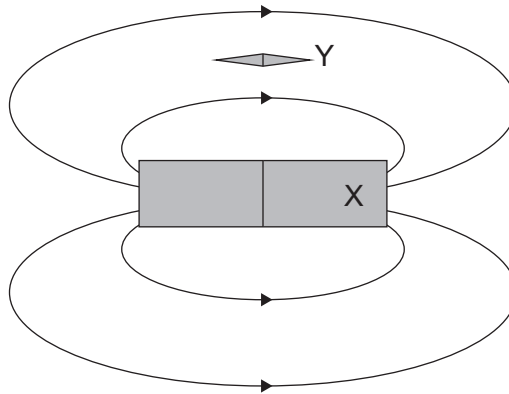
18. Two identical conducting spheres have charges 3 mC and 9 mC . The force between the spheres is F .



The spheres are put into contact and then returned to their initial positions. What is the new magnitude of the force between the spheres?

- A. $\frac{F}{2}$
- B. $\frac{27F}{36}$
- C. F
- D. $\frac{36F}{27}$

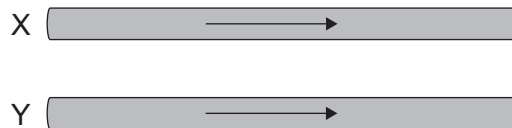
19. The diagram shows some magnetic field lines of a magnet and a compass needle placed near it. The needle aligns as shown.



What is the nature of the magnetic poles X and Y?

	X	Y
A.	North	North
B.	North	South
C.	South	North
D.	South	South

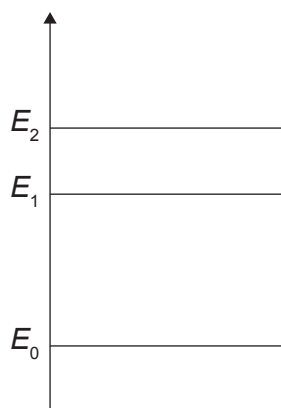
20. The same current is established in two long parallel wires, X and Y, as shown.



The current in Y is increased. What happens to the magnetic force acting on each wire?

	Force acting on X	Force acting on Y
A.	Remains the same	Remains the same
B.	Remains the same	Increases
C.	Increases	Remains the same
D.	Increases	Increases

21. The diagram shows three energy levels of an atom.



The photons emitted in transitions between these levels have energies of e_1 , e_2 and e_3 , where $e_1 < e_2 < e_3$. What are E_1 and E_2 ?

	E_1	E_2
A.	$E_0 + e_2$	$E_0 + e_3$
B.	$E_0 + e_2$	$E_0 + e_2 + e_3$
C.	$E_0 + e_1 + e_2$	$E_0 + e_3$
D.	$E_0 + e_1 + e_2$	$E_0 + e_2 + e_3$

22. A nucleus X with mass defect δ_x undergoes nuclear fusion with another nucleus Y with mass defect δ_y . The reaction releases energy to the environment, resulting in a nucleus Z with mass defect δ_z . What is the correct relation between these mass defects?

- A. $\delta_z = \delta_x + \delta_y$
- B. $\delta_z < \delta_x + \delta_y$
- C. $\delta_x < \delta_z < \delta_y$
- D. $\delta_z > \delta_x + \delta_y$

- 23.** In an experiment, the count rate of a radioactive sample is measured to be 64 Bq. After two half-lives have passed, the count rate is measured to be 34 Bq. What is the background count rate in this experiment?
- A. 10 Bq
 - B. 24 Bq
 - C. 30 Bq
 - D. 40 Bq
- 24.** Which part of a nuclear fission reactor is designed to reduce the kinetic energy of neutrons produced in the reaction?
- A. Control rods
 - B. Moderators
 - C. Turbine
 - D. Heat exchanger
- 25.** A main sequence star has a mass equal to three solar masses. What is the most likely final stage in the evolution of the star?
- A. Black hole
 - B. Neutron star
 - C. Red giant
 - D. White dwarf
-

Disclaimer:

Content used in IB assessments is often taken from authentic, third-party sources. The views expressed within them belong to their individual authors and/or publishers and do not necessarily reflect the views of the IB. Sometimes fictitious companies, products or individuals are included in assessments; any similarities with actual entities are purely coincidental. Any trademarks™ or registered® trademarks included are used for illustrative purposes only, and use does not imply any affiliation with or endorsement by the International Baccalaureate.