

APOLLO

Work and Kinetic Energy

FBISE Physics Class 11 (HSSC-I)

Domain B: Mechanics

22 questions | questions

Original FBISE question crops. National Curriculum 2022-23 topic.

13.	Which of the following is the primary reason why friction is a non-conservative force?	It always does negative work	Its work depends on the path taken	It depends on the mass of the object	It acts only on moving objects	☐ ☐ ☐ ☐
-----	--	------------------------------	------------------------------------	--------------------------------------	--------------------------------	---

14.	An object is dropped from a high cliff and experiences a constant air resistance force (f) during its fall. After falling through a vertical distance (h), its kinetic energy increases by (ΔK). Which equation represents the correct relationship between these variables?	$\Delta K = mgh$	$\Delta K = (mgh + fh)$	$\Delta K = (mgh - fh)$	$\Delta K = (fh - mgh)$	☐ ☐ ☐ ☐
-----	---	------------------	-------------------------	-------------------------	-------------------------	---

OR	What do you mean by conservative and non-conservative forces? Give two examples of each.	2+2
----	--	-----

(iii)	What is meant by 'conservative' and Non-conservative' forces? Give one example each.	03
-------	--	----

OR	State work-energy theorem. Explain this theorem for resistive medium.	06
----	---	----

OR	What is meant by work? How can work done be calculated graphically by a variable force?	03
----	---	----

03	OR	Differentiate between conservative and non-conservative forces. Give examples.
----	----	--

OR	Derive the formula for Kinetic Energy [using the equations of motion]	03
----	---	----

Second Annual 2025 | Section B Q2(vii) | 3 marks

	frequency.	
(vii)	A ball of mass 120 g is released from a height of 30 m. If the ball encounters an air resistance of 0.3 N, find the kinetic energy of the ball just before striking the ground.	03
	Briefly describe the elastic deformation and plastic	

Second Annual 2025 | Section B Q2(xi) OR | 3 marks

	Calculate the distance of the point from the charge.	
OR	Differentiate between conservative and non-conservative forces.	03
	A proton is moving in a circular orbit of radius 12 m.	

First Annual 2026 | Section B Q2(iv) | 3 marks

(iv)	Differentiate between conservative and non-conservative forces with examples.	03
(v)	Calculate the resistance of wire 10 m long that has	

First Annual 2026 | Section C Q6 | 6 marks

Q.6	a. Derive the expression for Kinetic energy. b. State work energy theorem in a resistive medium.	3+3
-----	---	-----

First Annual 2026 | Section B Q2(iv) | 3 marks

(iv)	Between the vectors. In a science experiment a 3.00 kg water rocket, is launched from ground. The rocket's total energy at the top of its flight is 2352 J. a. What was the rocket's launching speed? b. What height did the rocket reach?	03	OR	Find the power delivered by the engine for attaining velocity (3,4) ms ⁻¹ while it exerts a force (8, -2) N.	03
(v)	Calculate the resistance of a wire 10 m long that has			Differentiate between accuracy and precision of	

First Annual 2026 | Section C Q5 OR | 6 marks

OR	A ball of 100gm is thrown vertically upward at a speed of 25m/s. If no energy is lost, determine the height it would reach. If the ball only rises to 25m, calculate the work done against the air resistance. Also calculate the force of friction. a. State postulates of special theory of relativity	06
----	---	----

FBISE model paper | Section C Q6 OR | 6 marks

OR	In an experiment a 3kg water rocket is launched from ground. The rocket total energy at the top of its flight is 2352J. a. What was the rocket launching speed? b. What height did the rocket reach? c. What is the kinetic energy and potential energy of the rocket after 2.5s of its launch?	02+02 +02
----	--	--------------

First Annual 2025 | Section A Q7 | 1 mark

Two bodies with kinetic energies in the ratio of 4 : 1, are moving with equal linear momentum, the ratio of their masses is:	1 : 2	1 : 1	4 : 1	1 : 4
--	-------	-------	-------	-------

Second Annual 2025 | Section B Q2(v) | 3 marks

(v)	What is meant by work in Physics? Under what conditions work becomes positive and negative?	03
-----	---	----

Second Annual 2025 | Section B Q2(vi) | 3 marks

(vi)	Show that the work done by gravity on a body depends only on the initial and final positions, not on the path followed.	03
------	---	----

First Annual 2026 | Section B Q2(v) OR | 3 marks

OR	Explain work-energy theorem in a resistive medium.
----	--

First Annual 2026 | Section B Q2(v) | 3 marks

(v)	Derive the formula for kinetic energy.	03	OR	Explain work-energy theorem in a resistive medium.	1+2
-----	--	----	----	--	-----

First Annual 2026 | Section C Q5 | 7 marks

Q.5	A girl is dragging a suitcase and pulls it a distance of 4.90 m along level ground. She is applying a constant force of 16.8 N at 30° with the horizontal. A 0.170 N friction force opposes the suitcase's motion. Find (a) work done by Girl (b) work done by frictional force and (c) net work done by all the forces acting on the suitcase? $\vec{F}_A = 16.8 \text{ N}$ $\theta_m = 30^\circ$ $\vec{F}_f = 0.170 \text{ N}$ $d = 4.90 \text{ m}$	07	OR	Calculate the distance between the charges. a. Derive the formula for combined resistance of two or more resistors in series. b. Calculate the current that flows in the 1Ω resistor in the following circuit.
Q.6	Determine f_1, f_2 and f_3 for stationary waves in an open pipe.	2x3	OR	How is artificial gravity created to counter weightlessness. Determine linear velocity angular velocity, time period and frequency of artificial satellite.

— 1HA-I 26004 (Old 2022) —

$$\bullet V = IR \quad \bullet I = \frac{P}{V} \quad \bullet F = \frac{kq_1q_2}{r^2} \quad \bullet 1eV = 1.6 \times 10^{-19} J \quad \bullet \vec{A} \cdot \vec{B} = AB \cos \theta \quad \bullet A = \pi r^2 \quad \bullet E = \frac{F}{a}$$

First Annual 2026 | Section B Q2(xiii) OR | 3 marks

OR	Does the tension in the string of a swinging pendulum do any work? Explain.	03
OR	Smoke rises in a chimney when a breeze is blowing.	03