Topic 6 –Energy, work and power

1.

Which row gives an example of the stated form of energy?

	form of energy	example
A	gravitational	the energy due to the movement of a train along a level track
B	internal	the energy due to the flow of cathode rays in a cathode-ray tube
C	kinetic	the energy due to the position of a swimmer standing on a high diving board
D	strain	the energy due to the compression of springs in a car seat

2.

Which energy resource is used to generate electricity by first boiling water?

A hydroelectric

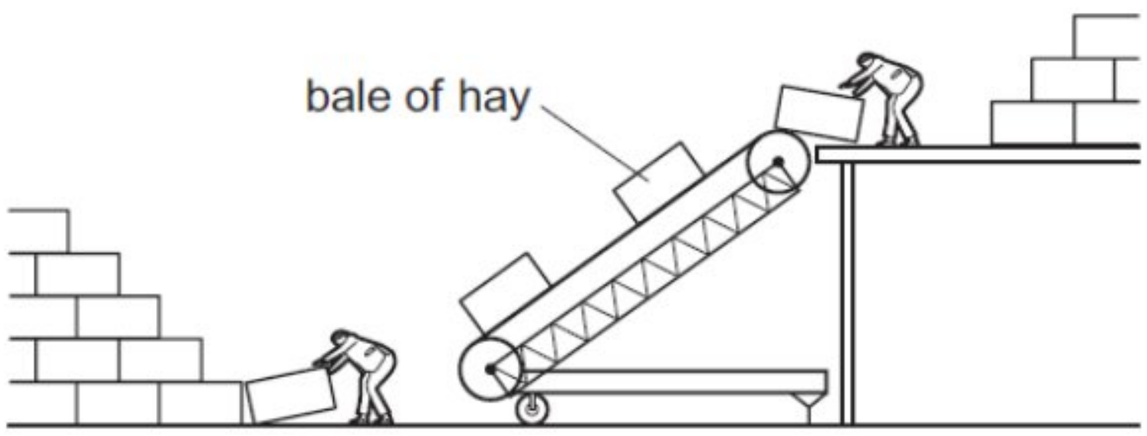
B nuclear fission

C tides

D waves

3.

Two farmers use an electrically powered elevator to lift bales of hay. All the bales of hay have the same mass.



As sunset approaches, they increase the speed of the motor so that more bales are lifted up in a given time.

How does this affect the work done in lifting each bale and the useful output power of the motor?

	work done in lifting each bale	useful output power of the motor
A	increases	decreases
B	increases	increases
C	no change	decreases
D	no change	increases

4.

Energy is stored in a battery and in a box of matches.

Which type of energy is stored in each of them?

	a battery	a box of matches
A	chemical	chemical
B	chemical	internal (thermal)
C	electrical	chemical
D	electrical	internal (thermal)

8.

A man lifts 20 bricks, each of weight 6 N.

What other information is needed to calculate the useful work done in lifting the bricks?

A the distance he lifts the bricks

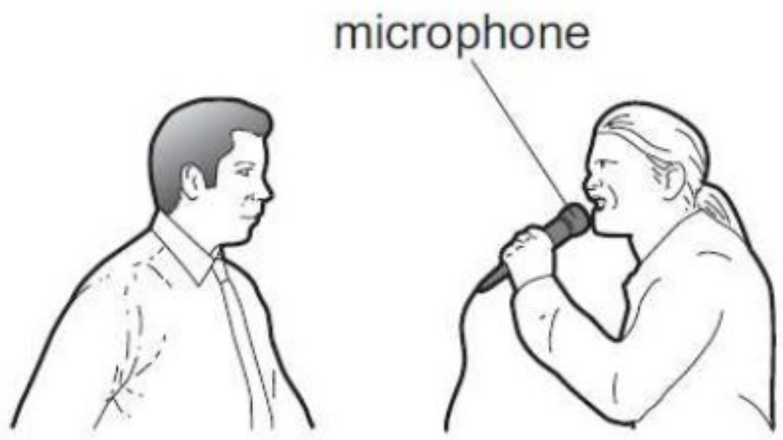
B the mass of the bricks

C the time taken to lift the bricks

D the volume of the bricks

9.

The diagram shows a microphone being used in an interview.

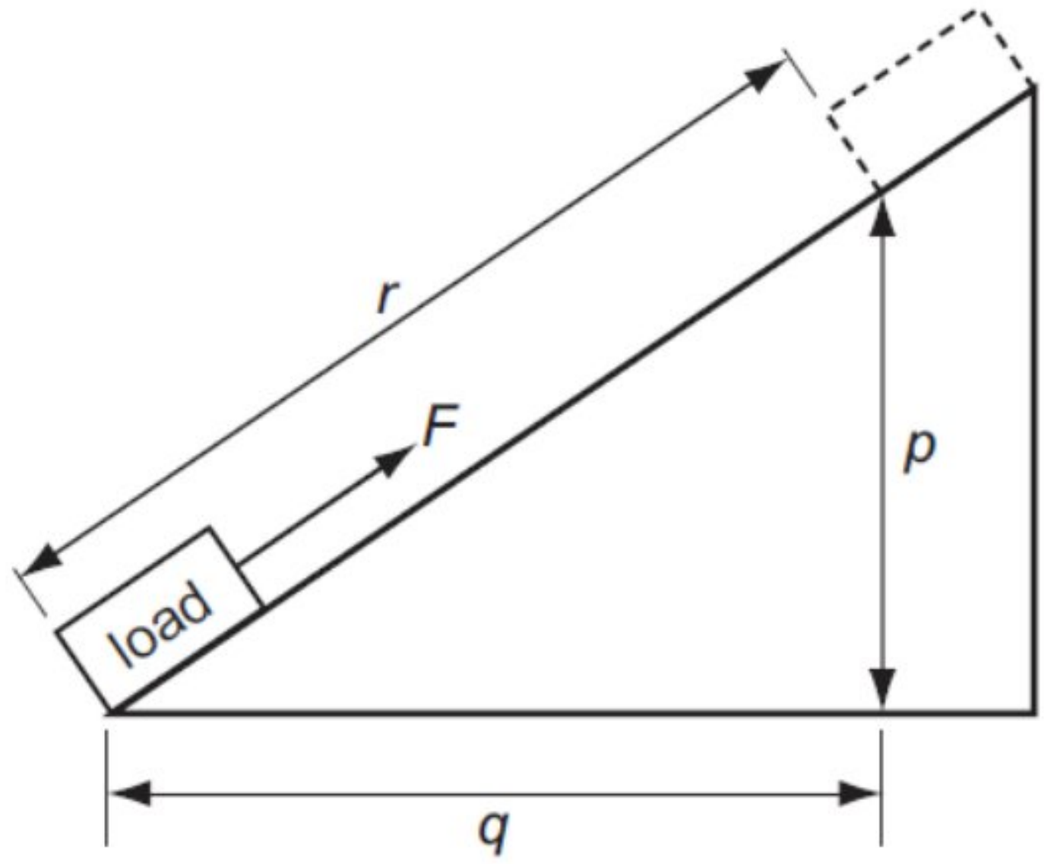


Which energy change takes place in the microphone?

	input energy	output energy
A	chemical	electrical
B	electrical	chemical
C	electrical	sound
D	sound	electrical

10.

A force *F* moves a load from the bottom of a slope to the top.



The work done by the force depends on the size of the force, and on a distance.

What is this distance?

A *p* **B** *q* **C** *r* **D** *p* + *q*

5.

Which of these is designed to change electrical energy into kinetic energy?

A a capacitor

B a generator

C a motor

D a transformer

6.

A car is driven on a long journey along a flat, horizontal road. The car stops several times on the journey and its engine becomes hot.

Which type of energy does **not** change during the journey?

A the chemical energy in the fuel tank

B the gravitational energy of the car

C the internal (thermal) energy of the engine

D the kinetic energy of the car

7.

The table shows the times taken for four children to run up a set of stairs.

Which child's power is greatest?

	mass of child / kg	time / s
A	40	10
B	40	20
C	60	10
D	60	20

11.

Electricity can be obtained from different energy resources.

Which energy resource is used to obtain electricity without producing heat to boil water?

A coal

B geothermal

C hydroelectric

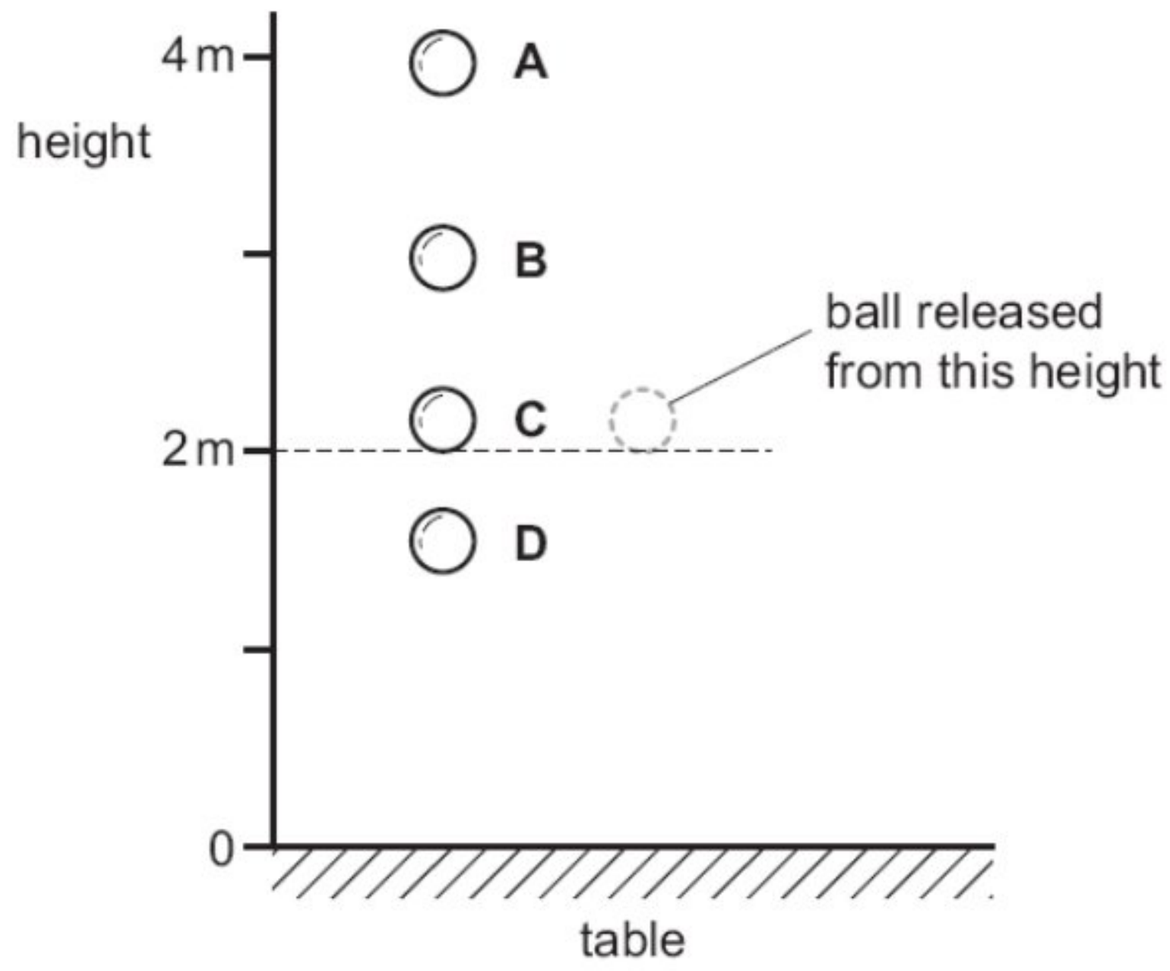
D nuclear

12.

A rubber ball is dropped from a height of 2 m on to a table.

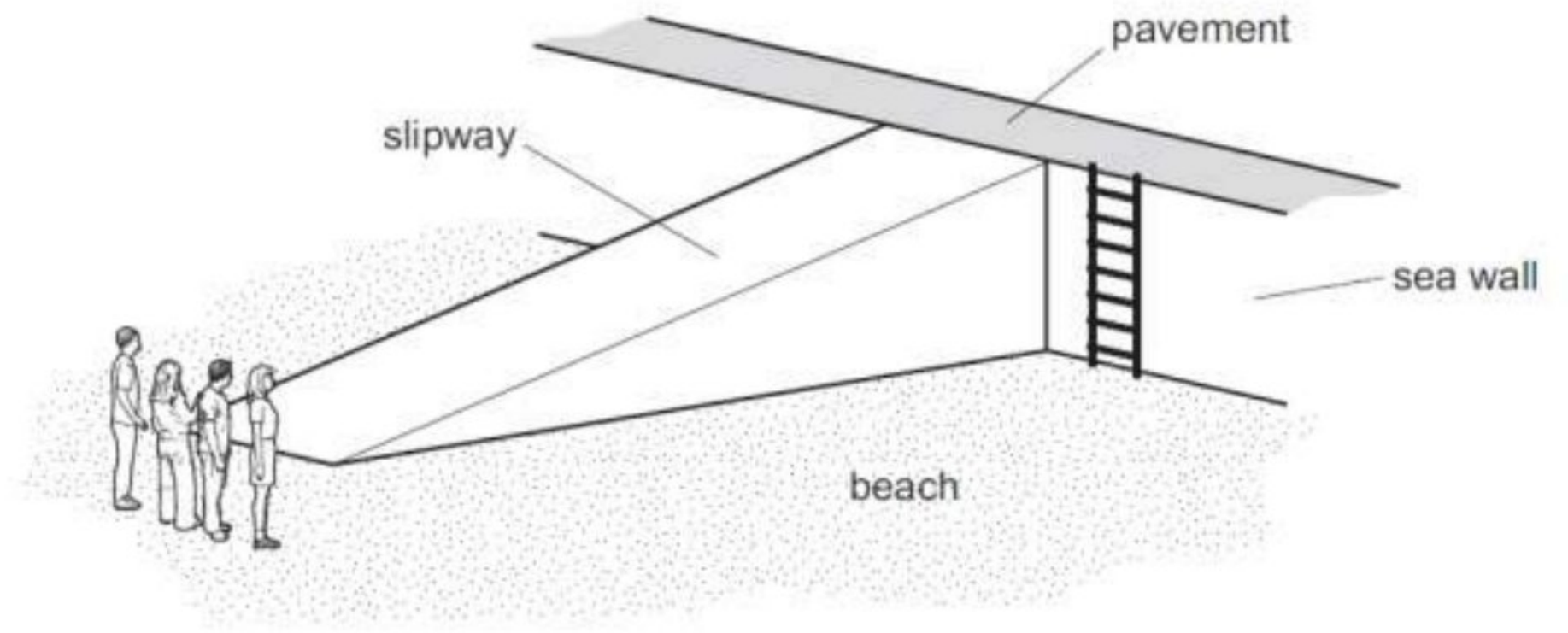
Whilst in contact with the table, some of its energy is converted into internal energy.

What is the highest possible point the ball could reach after bouncing?



13.

Four people of equal weight on a beach use different routes to get to the top of a sea wall.

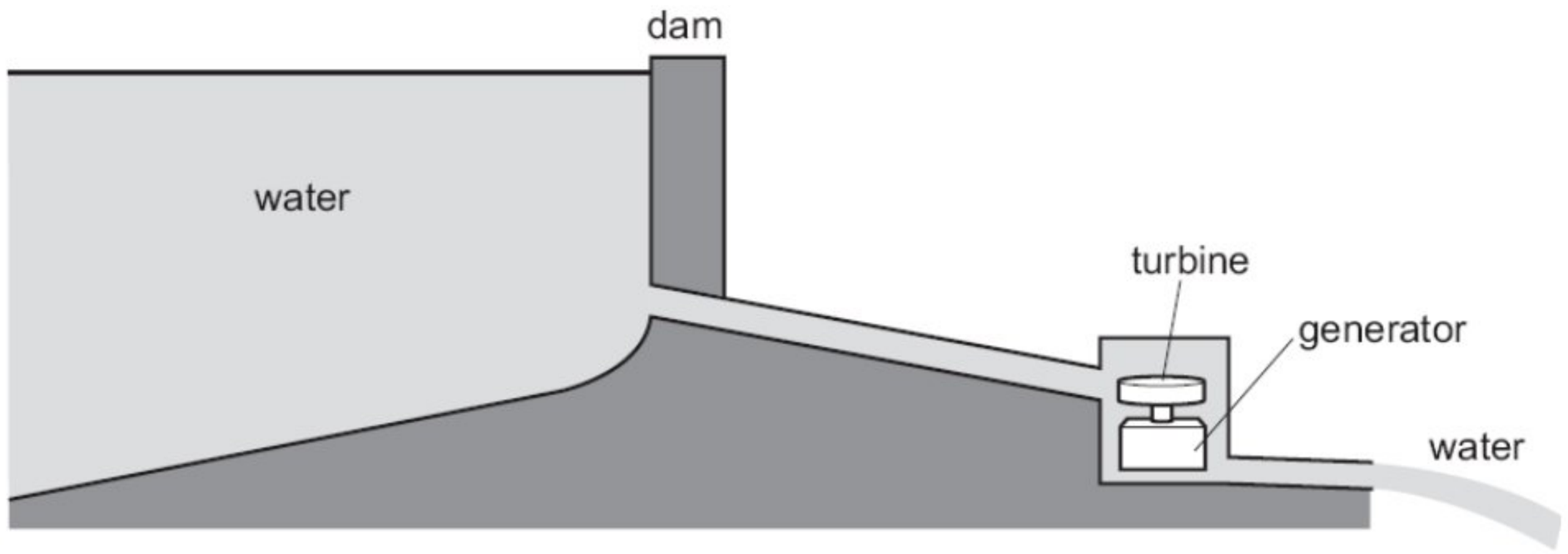


Which person produces the **greatest** average power?

person	route	time taken
A	runs across the beach, then climbs the ladder	8 s
B	walks across the beach, then climbs the ladder	16 s
C	runs up the slipway	5 s
D	walks up the slipway	10 s

14.

The diagram shows water stored behind a dam.



The water flows to a turbine and turns a generator.

Which sequence for the conversion of energy is correct?

A gravitational energy → kinetic energy → electrical energy

B kinetic energy → gravitational energy → electrical energy

C gravitational energy → electrical energy → kinetic energy

D kinetic energy → electrical energy → gravitational energy

15.

Which source of energy uses the production of steam to generate electricity?

A hydroelectric

B nuclear

C tides

D waves

16. ?

A worker is lifting boxes of identical weight from the ground onto a moving belt.

At first, it takes him 2 s to lift each box. Later in the day, it takes him 3 s.

Which statement is correct?

A Later in the day, less work is done in lifting each box.

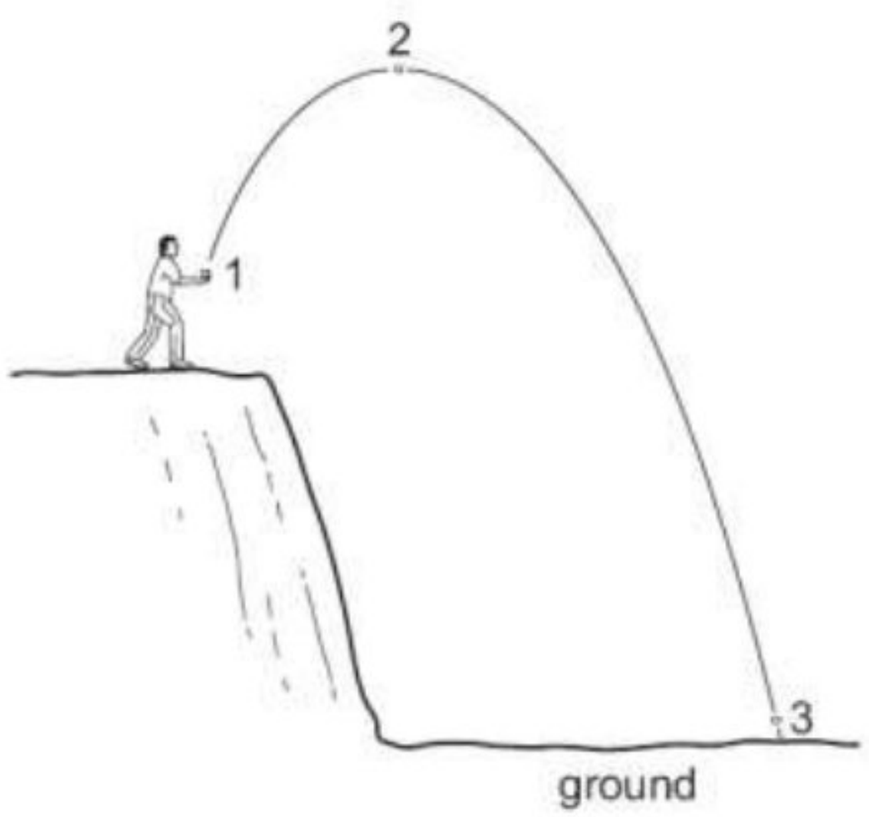
B Later in the day, more work is done in lifting each box.

C Later in the day, less power is developed in lifting each box.

D Later in the day, more power is developed in lifting each box.

17.

A stone is thrown from the edge of a cliff. Its path is shown in the diagram.

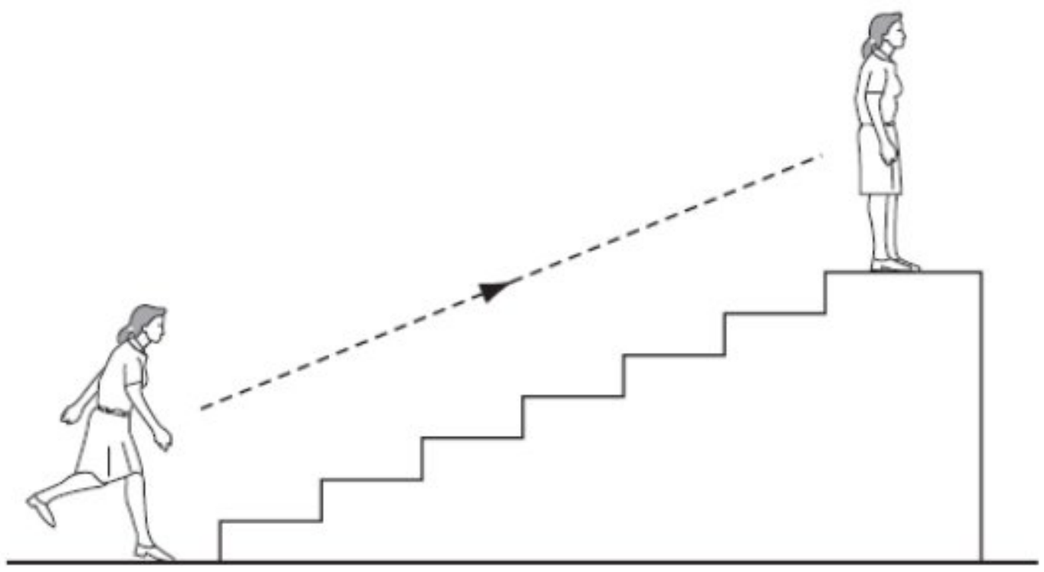


In which position does the stone have its greatest kinetic energy and in which position does it have its least gravitational energy?

	greatest kinetic energy	least gravitational energy
A	1	2
B	2	3
C	3	1
D	3	3

18.

A person uses chemical energy to run up some stairs.



She stops at the top of the stairs.

What has the chemical energy been converted to when she is at the top of the stairs?

A kinetic energy and gravitational energy

B kinetic energy and strain energy

C gravitational energy and heat energy

D strain energy and heat energy

19.

What is the source of the energy converted by a hydro-electric power station?

A hot rocks

B falling water

C oil

D waves

20.

Electrical energy may be obtained from nuclear fission.

In what order is the energy transferred in this process?

A nuclear fuel → generator → reactor and boiler → turbines

B nuclear fuel → generator → turbines → reactor and boiler

C nuclear fuel → reactor and boiler → generator → turbines

D nuclear fuel → reactor and boiler → turbines → generator

21.

Which form of energy is used to generate electrical energy in a tidal power station?

A chemical energy

B gravitational energy

C internal energy (thermal energy)

D nuclear energy

22.

Which line in the table gives an example of the stated form of energy?

	form of energy	example
A	gravitational	the energy due to the movement of a train
B	internal	the energy due to the flow of cathode rays in a cathode ray tube
C	kinetic	the energy due to the position of a swimmer standing on a high diving board
D	strain	the energy due to the compression of springs in a car seat

23.

Which type of power station does **not** use steam from boiling water to generate electricity?

A geothermal

B hydroelectric

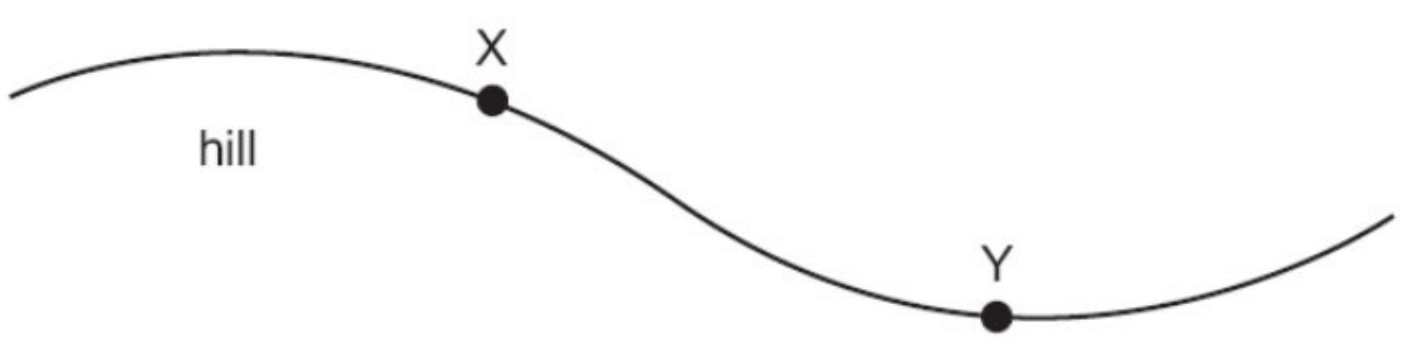
C nuclear

D oil-fired

24.

A cyclist travels down a hill from rest at point X without pedalling.

The cyclist applies his brakes and the cycle stops at point Y.



Which energy changes have taken place between X and Y?

A kinetic → internal (heat) → gravitational potential

B kinetic → gravitational potential → internal (heat)

C gravitational potential → internal (heat) → kinetic

D gravitational potential → kinetic → internal (heat)

25.

Which form of energy do we receive directly from the Sun?

A chemical

B light

C nuclear

D sound

26.

A labourer on a building site lifts a heavy concrete block onto a lorry. He then lifts a light block the same distance in the same time.

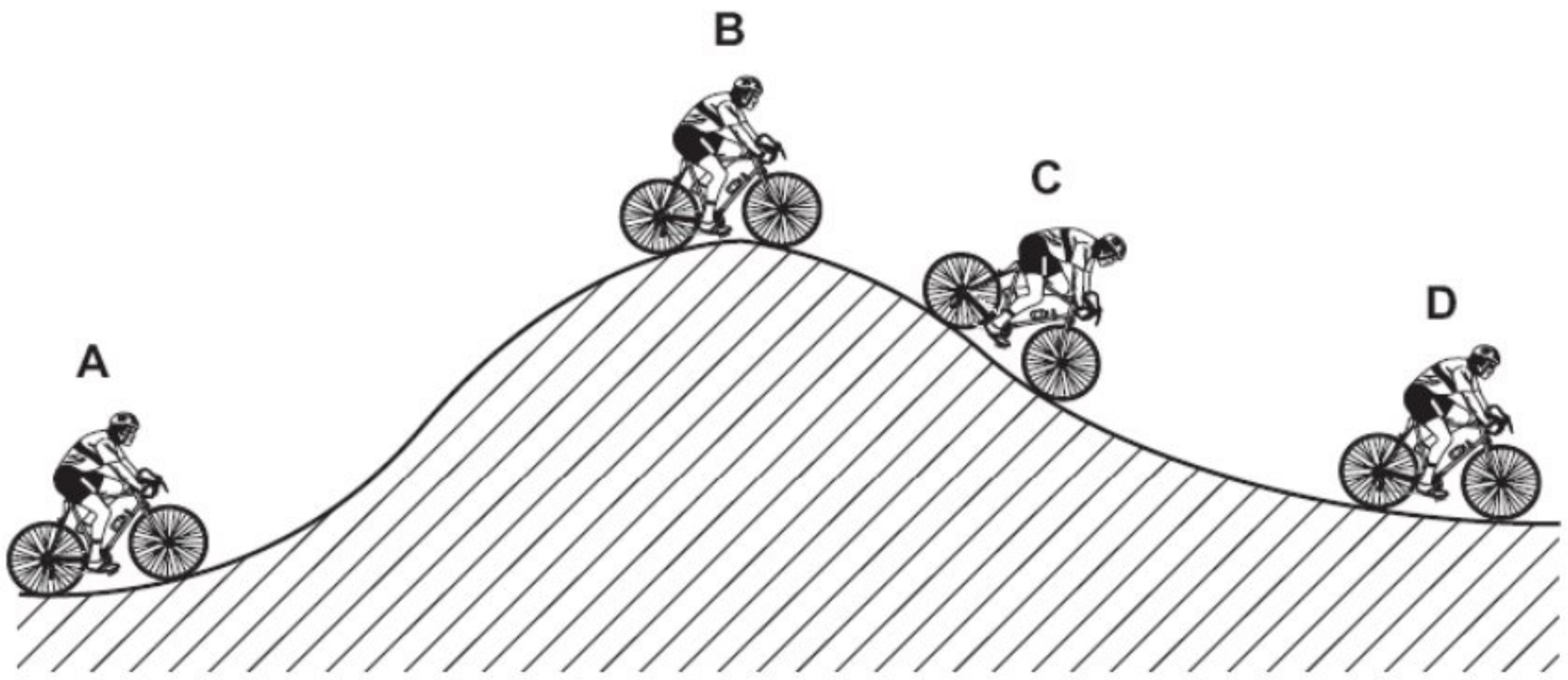
Which of the following is true?

	work done in lifting the blocks	power exerted by labourer
A	less for the light block	less for the light block
B	less for the light block	the same for both blocks
C	more for the light block	more for the light block
D	the same for both blocks	more for the light block

27.

The diagram shows a cyclist riding along a hilly road.

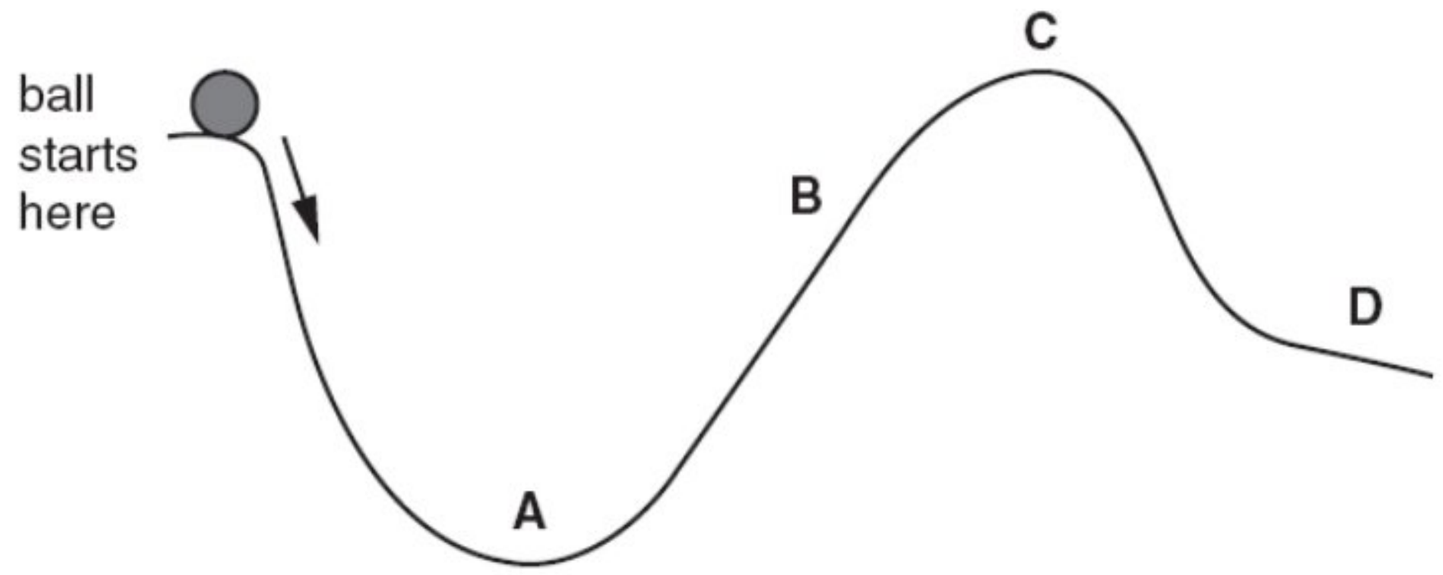
At which position does the cyclist have the least gravitational (potential) energy?



28.

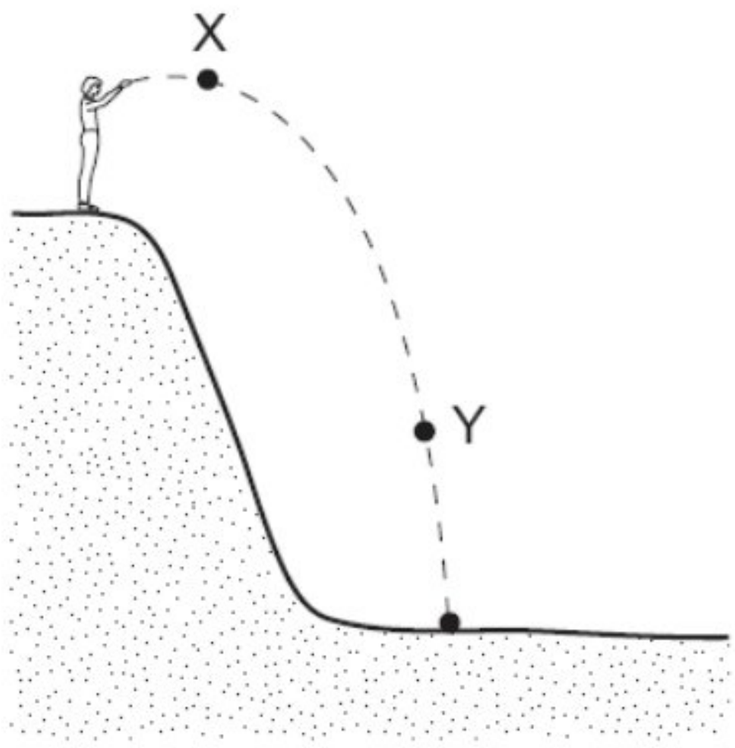
A ball is released from rest and rolls down a track from the position shown.

What is the furthest position the ball could reach?



29.

A man standing at the top of a cliff throws a stone.



Which forms of energy does the stone have at X and at Y?

	energy at X	energy at Y
A	gravitational only	kinetic only
B	kinetic only	gravitational only
C	gravitational only	gravitational and kinetic
D	gravitational and kinetic	gravitational and kinetic

30.

A child pushes a toy car along a level floor and then lets it go.

As the car slows down, what is the main energy change?

A from chemical to heat

B from chemical to kinetic

C from kinetic to gravitational (potential)

D from kinetic to heat

31.

A large electric motor is used to lift a container off a ship.

Which of the following values are enough to allow the power of the motor to be calculated?

A the mass of the container and the distance moved

B the force used and the distance moved

C the current used and the work done

D the work done and the time taken