

## Ministry of Education, Culture, Sport and Youth

**QUESTION PAPER OF PHYSICS**

**FOR STUDENTS WITH MIGRANT BACKGROUND**

# Student Details

Full Name: ………………………………………….

# Age: …………………………………………

# Country of Origin: …………………………………………

# School Name: …………………………………………

# Grade: ………….

Class: …………..

Date: ………………………

## Duration: 60 minutes

**INSTRUCTIONS:**

* The use of a calculator is not allowed.
* Answer all the questions.
* All questions are equally marked.
* Circle the correct answer.

**PART A**

1. A student wants to calculate how many seconds () are in a day. The operations he must do to calculate them are:

**A**:

**B**:

**C** :

**D**:

**E**:

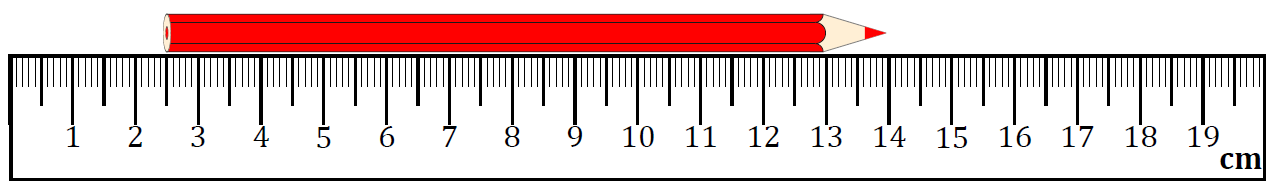
1. The table below shows various instruments. Choose the ones used for length measurement.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Α** | **B** | **C** | **D** | **E** |
|  |  |  |  |  |
| **Thermometer** | **Ruler** | **Scale** | **Micrometer** | **Tape-measure** |

1. A schoolgirl left her school at 13:42 to return home on foot. She arrived at her house at 14:07. Calculate how many minutes she needed for this route and choose from the options below the answer you agree with.

**Α**: 665 min **Β**: 85 min **C**: 25 min **D**: 35 min **Ε**: None

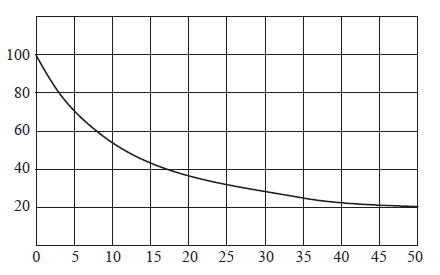
1. To measure the length of his pencil, a student placed a ruler next to his pencil, as shown in the image below.



Calculate the length of the pencil (from the base to the tip) and choose the correct answer

**Α**:             **Β**: 19 cm **C**: 14 cm **D**: 16,5 cm **Ε**: 12,5 cm

1. A container of water with temperature is left to cool. Every 5 minutes its temperature is measured and from the data obtained the following graph is made which shows how the water temperature changes as a function of time.



**Time (Minutes)**

**Temperature ()**

After approximately how many minutes from the start of the measurements has the water temperature decreased by ?

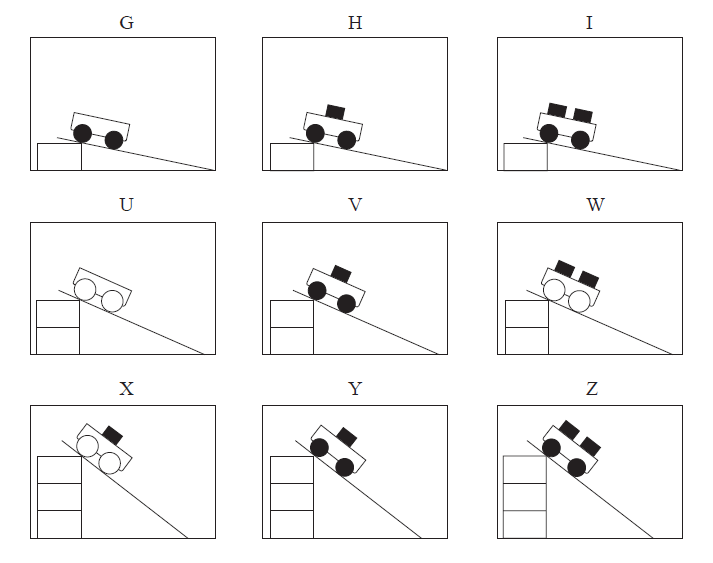
**Α**: 8 minutes **Β**: 17 minutes **C**: 25 minutes **D**: 40 minutes **Ε**: 50 minutes

1. The density of a body is given by the equation

where is the mass of the body and is its volume. A body has density of and volume of . The mass of the body is:

**Α**:             **Β**:             **C**:            **D**:     **Ε**:

1. The pictures below show nine experiments performed by a group of students. The team used trolleys with wheels of two different diameters. The carts loaded different numbers of cubes of the same mass. The team allowed the car to roll from different heights on the same ramp each time.



1

2

3

4

5

6

7

8

9

The team wants to test the following hypothesis: the higher the height from which the car is left, the higher its speed will be at the end of the ramp. Which three experiments should they compare?

**Α**: 1, 2 and 3 **Β**: 3, 6 and 9 **C**: 3, 5 and 7 **D**: 4, 6 and 7 **Ε**: 2, 5 and 8

1. The three physical quantities and are are linked with ratio

Which of the following statements applies to these three physical quantities?

**A**: The physical quantities and are proportional.

**B**: The quantities and are proportional and the quantities and are inversely proportional.

**C**: The sizes are both proportional and inversely proportional.

**D**: The quantities and are proportional and the quantities and are inversely proportional.

**E**: The quantities and are proportional and quantities and are inversely proportional.

1. Each of the following three sentences refers to a physical quantity.

S1: *The space occupied by a body.*

S2: *The amount of matter contained in the body*.

S3: *The force with which the Earth pulls the body*.

These sentences refer to the following physical quantities:

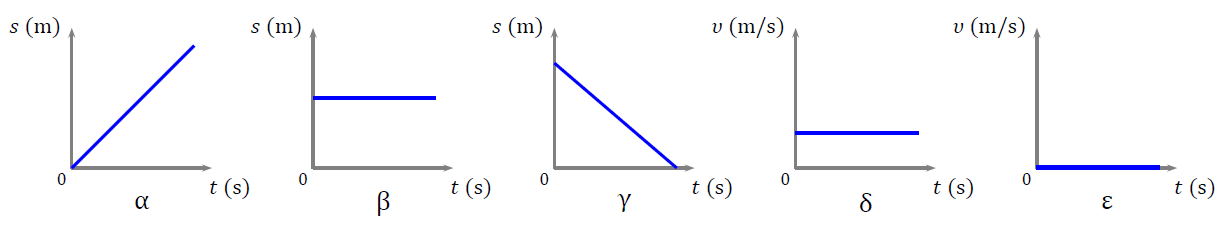
**A**: S1 - weight, S2 - volume, S3 - mass

**B**: S1 - mass, S2 - volume, S3 - weight

**C**: S1 - volume, S2 - mass, S3 - weight

**D**: S1 - volume, S2 - weight, S3 - mass

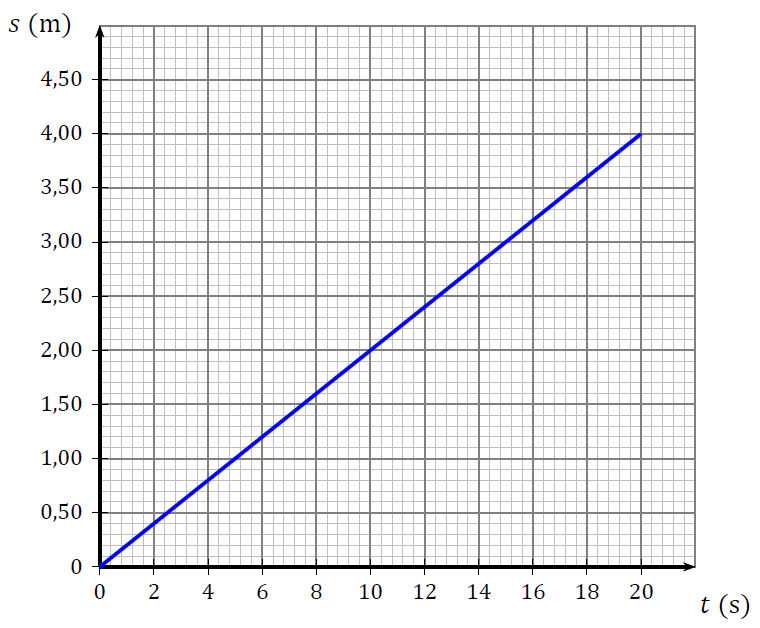
**E**: S1 - mass, S2 - weight, S3 - volume

1. There are five graphs below that show how the distance of a body changes from the starting point as a function of the time or how the speed of the body changes as a function of the time.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **a** | **b** | **c** | **d** | **e** |

Which of these graphs shows that the body is immobile?

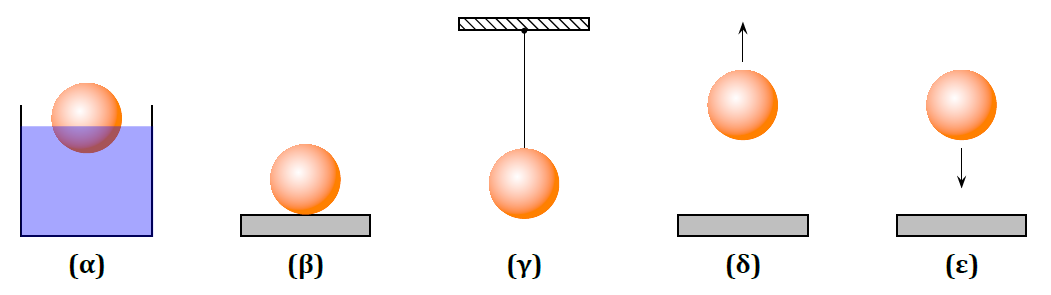
**Α**: Only b **Β**: b, d and e **C**: b and d **D**: b and e **Ε**: d and e

1. A body starts from the starting point at time and moves away from it at a constant speed. The graph below shows the distance of the body from the starting point as a function of time.

The body will be separated from the starting point by a distance of at time

**Α**: 0,80 s **Β**: 2 s **C**: 10 s **D**: 12 s **Ε**: 20 s

1. The diagrams below show five balls. In **(a)** the ball floats on the surface of the water, in **(b)** it is on the ground, in **(c)** it is hung by a thread, in **(d)** it is in the air and moves upwards and in **(e)** it is in the air and moves downwards.



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **(a)** | **(b)** | **(c)** | **(d)** | **(e)** |

In which of the above cases is the force of gravity exerted on the ball?

**A**: Only in **(e)**

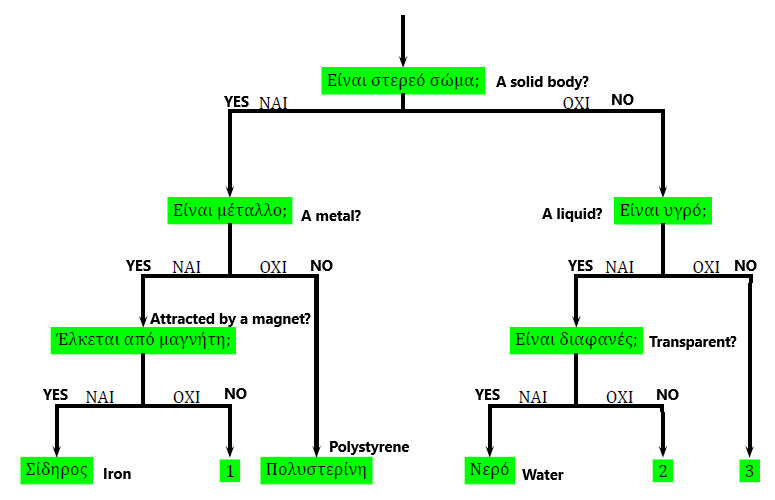
**B**: Only in **(b)** and **(c)**

**C**: In **(a)**, **(b)** and **(c)**

**D**: In all

**E**: In none

1. The diagram below shows a way to classify materials



What materials can the numbers 1, 2 and 3 represent? Choose the correct answer.

**Α**: 1: copper 2:flour 3: oxygen

**Β**: 1: aluminium 2: milk 3: air

**C**: 1: steel 2: wood 3: plastic

**D**: 1: gold 2: oil 3: oxygen

**Ε**: 1: iron 2: polysterene 3: water

1. Springs 1 and 2 are exactly the same. They have been compressed and two identical balls have been placed on their free ends, as shown in the picture below.



2

Which of the following statements is incorrect?

**A**: If the springs are released, the ball on the edge of spring 1 will gain more kinetic energy than the ball on the edge of spring 2.

**B**: Springs 1 and 2 have elastic energy stored.

**C**: If the springs are released, the ball on the edge of spring 1 will gain less kinetic energy than the ball on the edge of spring 2.

**D**: If the springs are released, their energy will be spread on the balls through mechanical work.

**E**: In spring 2 there is more elastic energy stored than in spring 1.

1. The photos below show three cases of friction between two bodies.



The bow is rubbed against the strings.

The file rubs the wood.

The young man rubs his hands.

The main effect of friction in the three cases is, respectively:

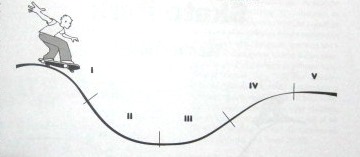
**A:** Heat, sound, wear

**B:** Sound, heat, wear

**C:** Wear, sound, heat

**D:** Sound, wear, heat

**Ε:** Wear, heat, sound

1. Antonis is standing on his skate at the highest point of the track, as shown in the figure below. He initially moves along the downhill sections of the track (sections **I** and **II**) and then along the uphill sections of the track (sections **III** and **IV**). Finally, he moves along the horizontal part of the track (part **V**).

Which of the following statements correctly describes the changes in Antonis' speed?

**A:** Antonis' speed increases all the way (sections I - V).

**B**: In sections **I** and **II** the speed increases and in the rest it decreases.

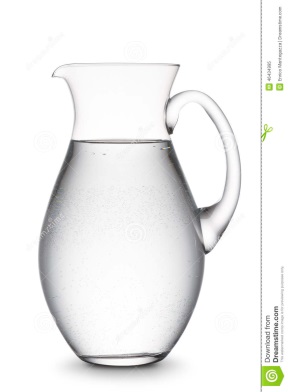
**C**: In sections **I** and **II** the speed increases, in sections **III** and **IV** it decreases and in section **V** it is constant.

**D**: In section **I** the speed increases, in sections **II** and **III** it is constant and in sections **IV** and **V** it decreases.

**E**: In sections **I** and **II** the speed increases, in **III** it is constant, in **IV** it decreases and in **V** it is constant.

1. Nikolas wants to investigate whether the amount of liquid in a glass container affects the volume of sound produced when he taps the wall of the container with a spoon. For this purpose, he used the following container with water.

Which other two of the following containers should he use in his experiment?



1

2

3

4

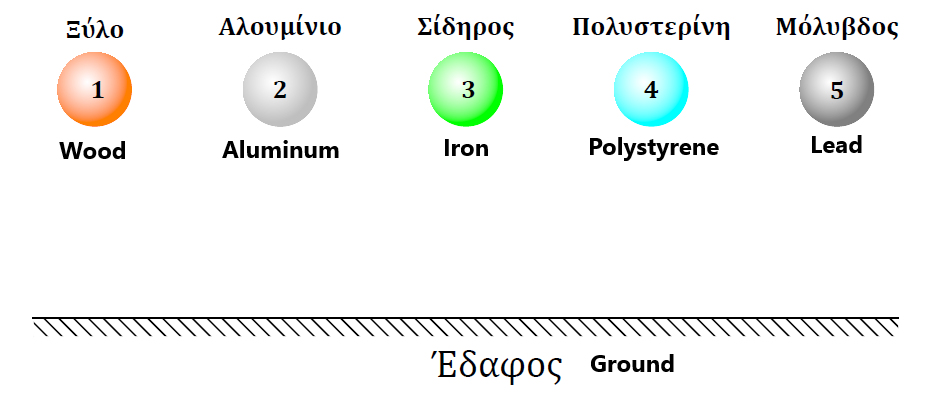
5

**Α:** 1 and 5 **Β:** 1 and 2 **C:** 4 and 5 **D:** 1 and 4 **Ε:** 3 and 5

1. A car is moving at speed . In two minutes, the car will cover a distance of

**Α**:             **Β**:               **C**:               **D**:                 **Ε**:

1. The figure below shows five spheres of different materials, which have the same volume.



The spheres are allowed to fall from the same height on the ground. If the spheres are dropped at the same time and the air resistance is negligible, choose the correct order in which the spheres will hit the ground.

**A**: 5, 3, 2, 1, 4

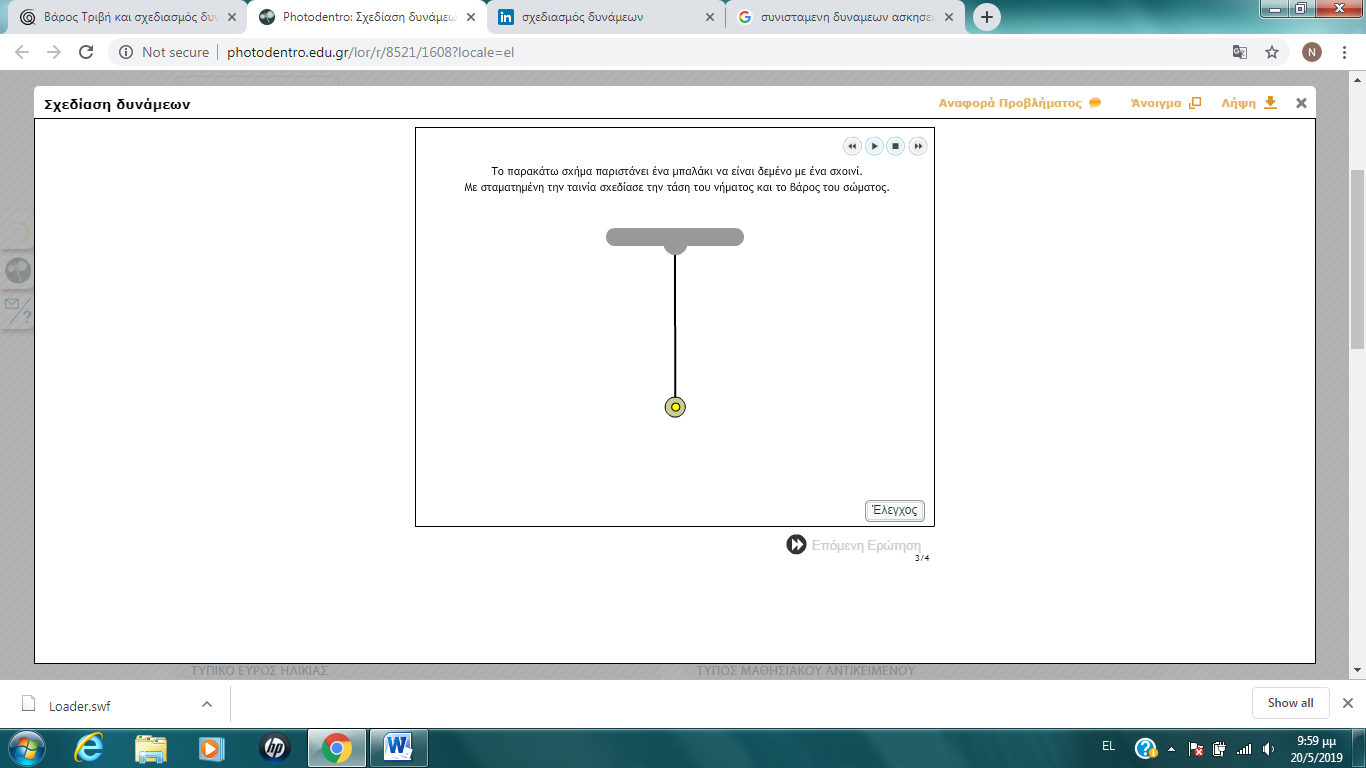
**B**: 5 and 3 at the same time, then 2 and then 1 and 4 at the same time

**C**: 4, 1, 2, 3, 5

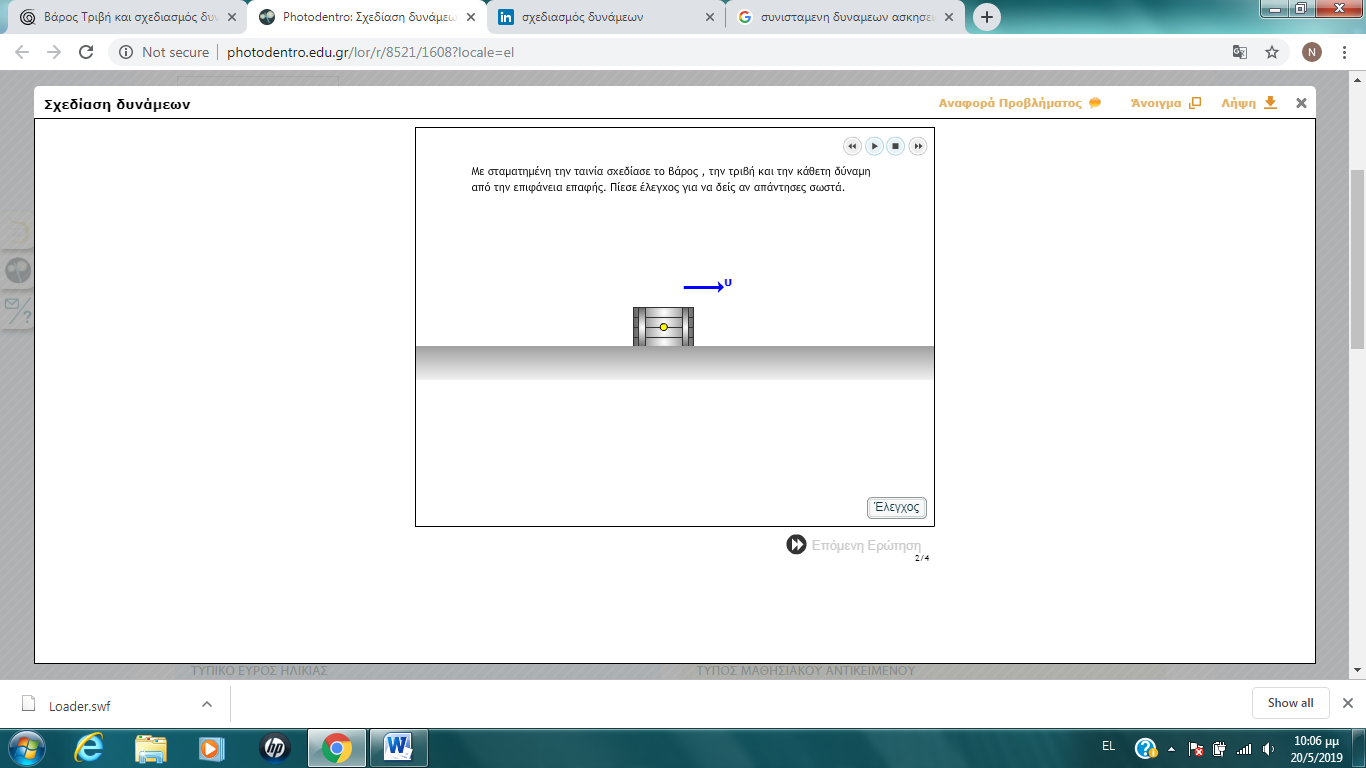
**D**: They will all hit the ground at the same time

**E**: 5, 3 and 2 at the same time, then 1 and then 4

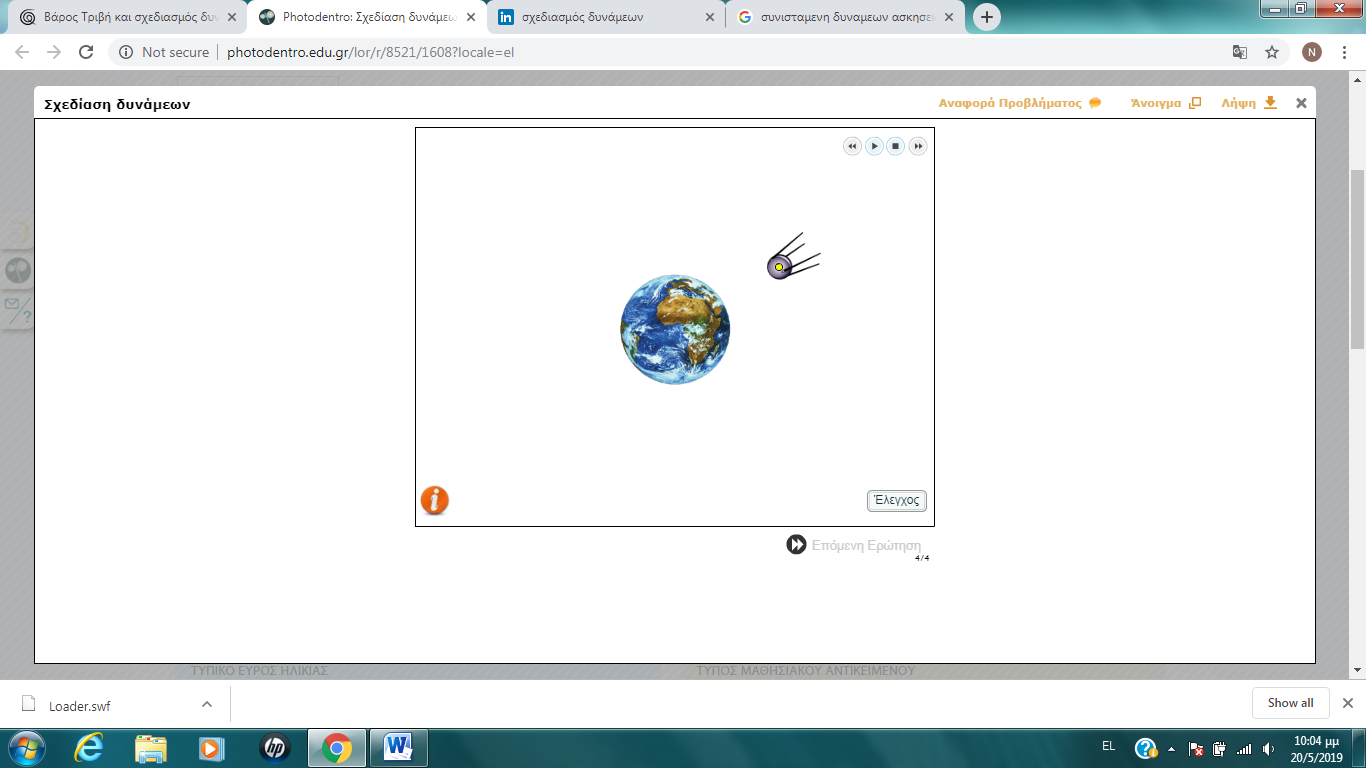
1. In the following images there are bodies on which forces are exerted.



**(a)** Body hanging with thread



**(c) A** body that moves on a surface by friction



**(b)** Body falling to Earth



**(d)** Body attracted by a magnet



**(e)** Parachutist who falls with an open parachute

In which of the above cases are contact forces exerted on the bodies?

**A**: In **(a)**, **(c)** and **(e)**

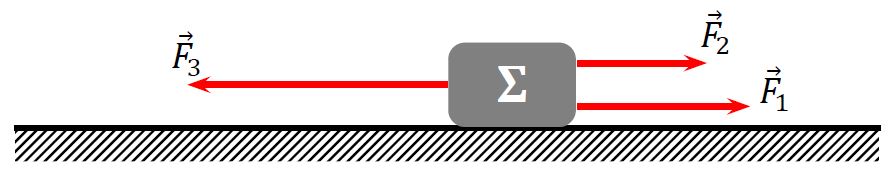
**Β**: In **(a)**, **(c)** and**(d)**

**C**: In **(b)** and **(e)**

**D**: In **(a)** and **(c)**

**E**: Only in **(a)**

**PART B**

1. The body Σ is on a smooth horizontal plane, as shown in the figure below.

Three horizontal forces , and are exerted on the body . The measures of the forces are: and . If the mass of the body is the movement that the body will make is:

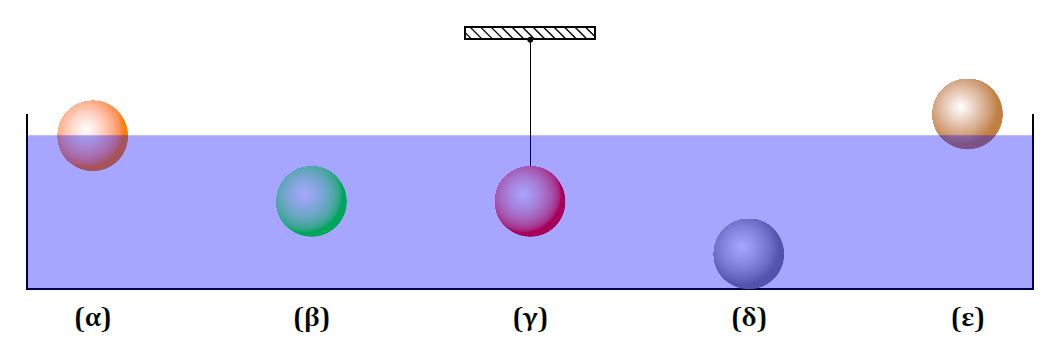
**A**: With acceleration to the right

**B**: At a constant speed to the right

**C**: With acceleration to the left

**D**: At a constant speed to the right

**E**: With acceleration to the right

1. Five spheres (a), (b), (c), (d) and (e) balance in a container of water, as shown in the figure below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **(a)** | **(b)** | **(c)** | **(d)** | **(e)** |

In which spheres is the buoyant force equal to the weight of the body?

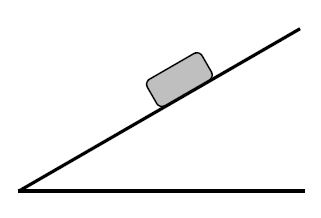
**A**: In all

**B**: Only in **(b)**

**C**: In **(a)** and **(e)**

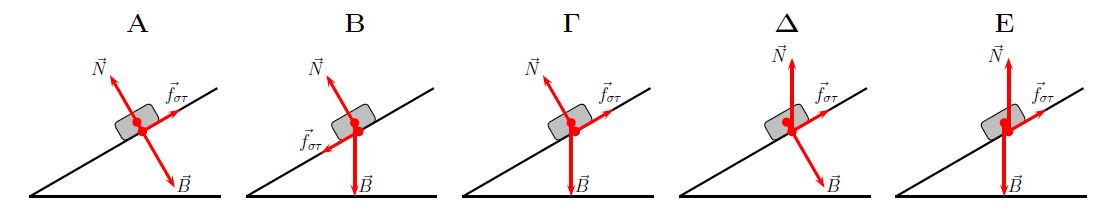
**D**: In **(a)**, **(b)** and **(e)**

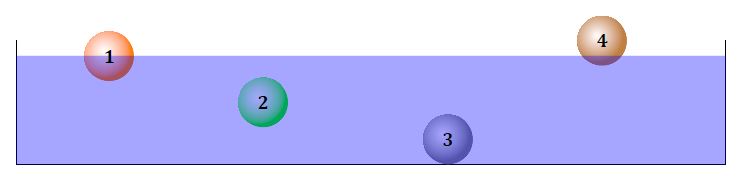
**E**: In **(b)**, **(c)** and **(d)**

1. A body balances on an inclined plane, as shown in the figure below.

From the diagrams A, B, C, D and E shown below, choose the one that correctly represents the forces exerted on the body.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A | B | C | D | E |



1. Four spheres 1, 2, 3 and 4 with densities and , respectively, balance in a container with density liquid .

Which of the following relationships between the densities of spheres and the liquid is correct?

**A**:

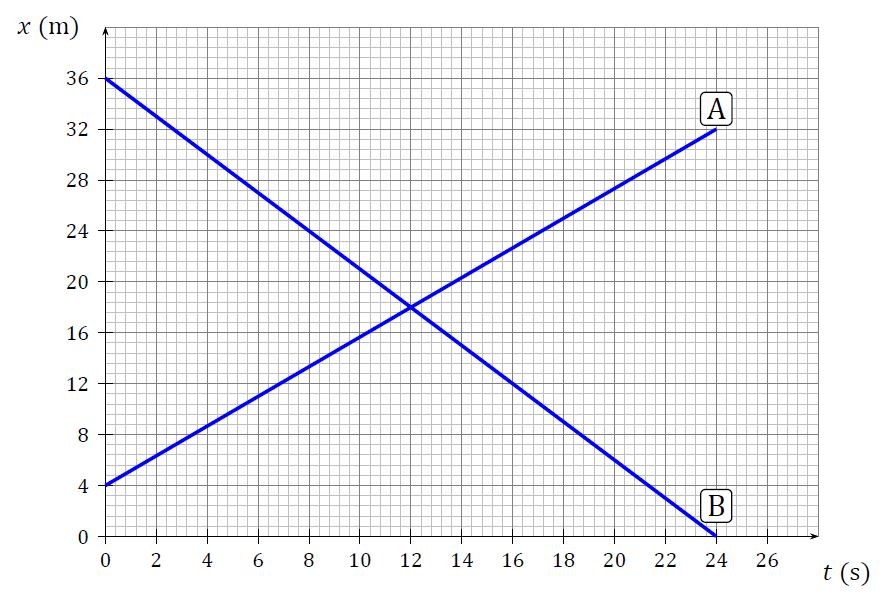
**Β**:

**C**:

**D**:

**E**:

1. Two bodies A and B move on a straight line. The graph of the position of two bodies is shown below.



Using data from the graph, choose the correct answer to the following questions.

1. The initial distance between the two bodies is:

**Α**:               **Β**:               **C**:               **D**:               **Ε**:

1. The time when the two bodies are in the same position is:

**Α**:               **Β**:               **C**:                 **D**:                 **Ε**:

1. The measure of the velocity of bodies A and B is:

**Α**:

**B**:

**C**:

**D**:

**Ε**:

1. The distance that each body has traveled by time is:

**Α**:

**Β**:

**C**:

**D**:

**E**: