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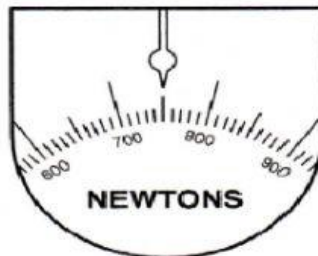
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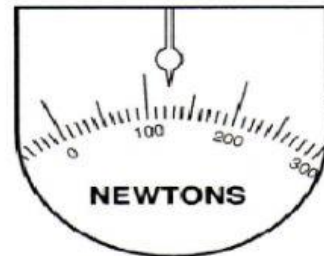
Topic 6 : Forces and Pressure

TOPIC 6.1: FORCES

1. Figure below shows the weight of the same astronaut on earth and on the moon. Explain the difference in his weight.



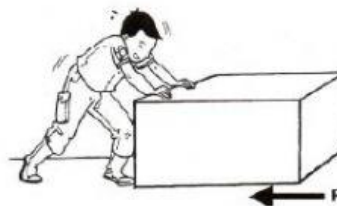
Weight on earth



Weight on the moon

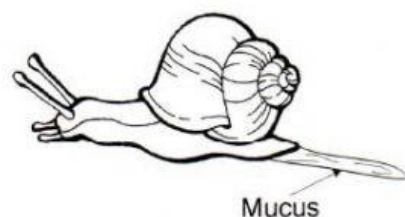
- A. The force of gravity on the moon is equal to that on earth.
B. The force of gravity on the moon is lesser than that on earth.
C. The force of gravity on the moon is more than that on earth.
D. The force of gravity on the moon is zero.
2. An astronaut carried out an experiment on the surface of the moon by dropping a screwdriver and a piece of tissue paper from the same height and at the same place. it was observed that both objects reached the moon's surface at the same time. What is the explanation for this observation?
- A. There is no friction because the moon has no atmosphere.
B. The screwdriver and tissue paper have the same weight in a vacuum.
C. The screwdriver and tissue paper have the same mass on the moon.
D. There is no gravity on the moon.
3. Figure below shows Azim pushing a box on the floor.
What type of force **R** is acting in the opposite direction on the box?

- A. Friction.
B. Gravity.
C. Magnetic.
D. Turning.

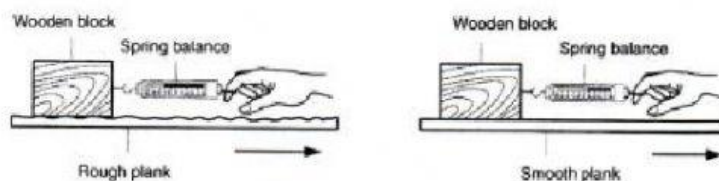


4. Snails produce mucus to help them along the ground. How does the mucus help snails move?
(SPE/2018/Q17)

- A. Mucus leaves a trail on the ground.
B. Mucus lowers the temperature of the ground.
C. Mucus reduces friction.
D. Mucus reduces the snail's mass



5. Study the experiment in figure below.



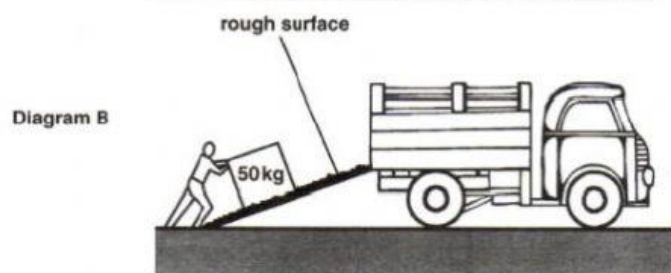
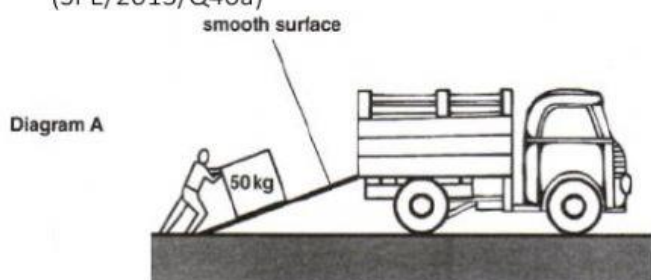
To ensure a fair test, which of the following variables should stay the same throughout the experiment? (SPE/2015/Q16)

	Mass of wooden block	Type of spring balance	Type of surface
A.	/	/	/
B.	X	X	/
C.	/	/	X
D.	X	/	X

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Key: / = Yes X = No

6. Figure below shows a person moving a 50 kg box up a ramp. (SPE/2013/Q46a)



a) In which diagram would you have to apply more force to move the box? [1]

b) Give a reason for your answer. [1]

TOPIC 6.2: EFFECTS OF FORCES

1. Forces can change the mass of an object.
(SPE/2010/Q42d)

TRUE / FALSE

2. Use words from the following list to complete the passage below. Each word may be used once, or not at all. [5]
(SPE/2009/Section B Q1)

direction	heat	lubrication	mass	rough
shape	speed	motion	potential	

When we stretch a rubber band, it becomes longer and thinner. This shows that forces can change the _____ or size of an object. Forces can also change the _____ of an object, e.g. a ball being stopped by a player. Slowing down a car by pressing the brake makes use of a force called friction. The force of friction is higher between _____ surfaces as compared to smooth ones. Friction also converts kinetic energy into _____ energy. Oil can be used to reduce friction between moving parts in a machine. This is called _____.

3. Which of the following is **NOT** an effect of a force?

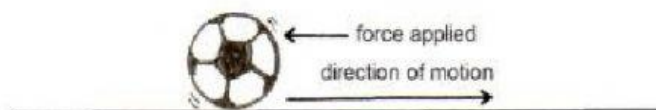
- A. Changes the direction of a moving object.
- B. Changes the mass of an object.
- C. Changes the shape of the object.
- D. Changes the speed of the object.

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4. A ball is rolling towards the right. A force is applied on the ball in the opposite direction as shown in figure below. Which of the following effects could happen to the ball?
(SPE/2017/Q20)

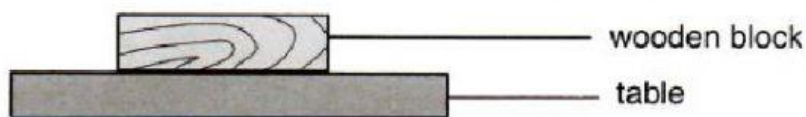
- i. It stops moving completely.
- ii. It rolls backwards (to the left).
- iii. It rolls forward at a slower speed.
- iv. It rolls forward at a faster speed.

- A. (i) (ii)
- B. (ii) (iii)
- C. (i) (ii) (iii)
- D. (ii) (iii) (iv)

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TOPIC 6.3: MEASUREMENT OF FORCES

1. A student puts a block of wood on a table as shown on figure below. She wants to measure the force needed to move the block to the left.



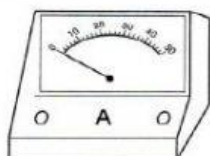
Which one of the following instruments should be used?

(SPE/2018/Q19)

A.



B.



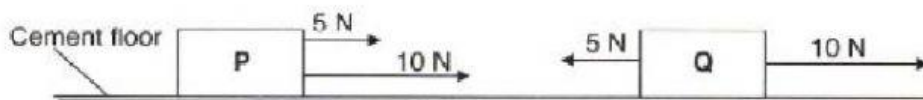
C.



D.



2. Figure below shows two identical blocks of wood, **P** and **Q**. Two sets of forces are applied to move the blocks of wood.



In which direction will **P** and **Q** move?

(SPE/2012/Q12)

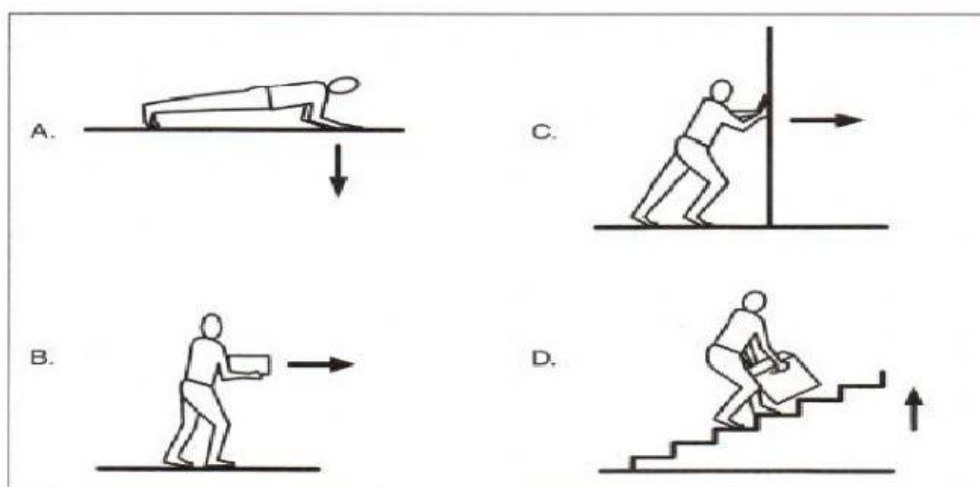
- A. Both **P** and **Q** will move to the right.
B. **P** will move to the right while **Q** will move to the left.
C. **P** will move to the right while **Q** will not move.
D. **P** will not move while **Q** will move to the right.



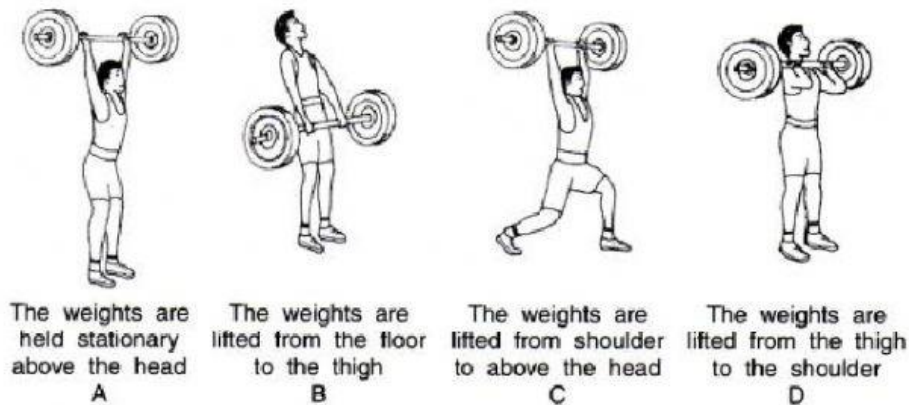
TOPIC 6.4: WORK DONE

1. In which of the following situations, is work done?

(SPE/2013/Q14)

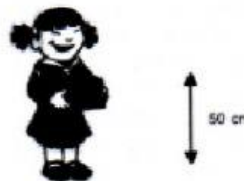


2. Weightlifting involves a number of different stages. At which stage is no work done?
(SPE/2014/Q16)



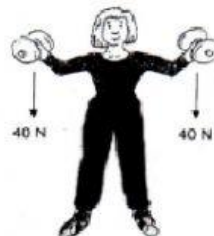
3. Anita picked up two boxes from the floor up to a height of 50 cm as shown below. Calculate the work done by Anita if each box weighs 10 N.
(SPE/2009/Q15)

- A. 5 J
B. 10 J
C. 500 J
D. 1000 J



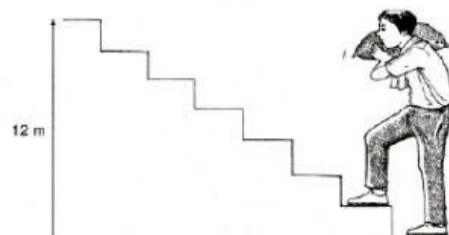
4. Fathin lifted two dumb bells 80 cm above the floor as shown in figure below. Calculate the work done by Fathin?
(SPE/2010/Q22)

- A. 10 joules.
B. 64 joules.
C. 640 joules.
D. 1280 joules.



5. Figure below shows Zainal carrying a sack of 'Beras Laila' weighing 100N up a flight of stairs. Calculate the work done by Zainal if his body weight is 550N?
(SPE/2011/Q23)

- A. 9750 joules.
B. 8250 joules.
C. 7800 joules.
D. 6600 joules.



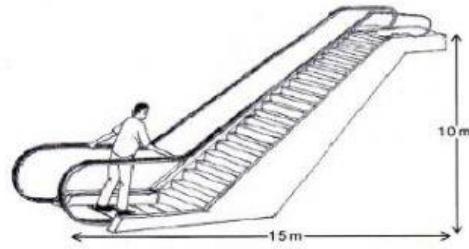
6. Figure below shows a 500 N athlete runs up a hill through a height of 5 metres in 50 seconds. Calculate the work done in reaching the top of the hill.
(SPE/2013/Q15)

- A. $500 / 50 = 10 \text{ Nm}$
B. $500 / 5 = 100 \text{ Nm}$
C. $500 \times 5 = 2500 \text{ Nm}$
D. $500 \times 50 = 25000 \text{ Nm}$



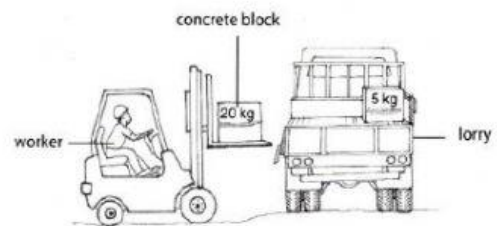
7. Adnan weighs 500N. He climbs up the escalator and reach the first floor in 25 seconds. Calculate the work done by Adnan.
(SPE/2015/Q17)

- A. 0 J
B. 5000 J
C. 7500 J
D. 125 000 J



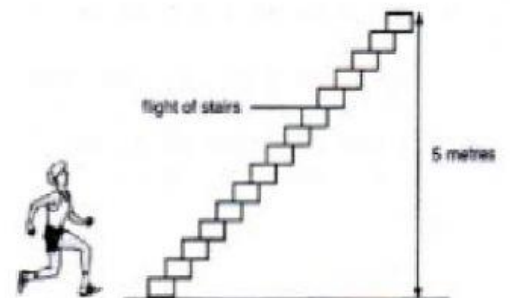
8. A worker lifted a 5 kg concrete block into a lorry of height of 1.5 m in 3 minutes. Next he lifted a 20 kg concrete block into a lorry at the same height (1.5 m) and time (3 minutes) as shown in figure below. Which of the following is correct?
(SPE/2016/Q20)

- A. The work done is the same for both blocks.
B. The work done is less for the 5 kg block
C. The work done is less for the 20 kg block.
D. The work done is more for the 5 kg block.



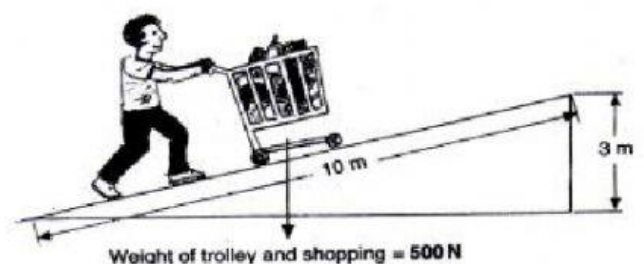
9. Figure below shows an athlete whose body weighs 750 N running up a flight of stairs of 15 steps.
(SPE/2009/Section B Q4a i and ii)

- a) Calculate the work done by the athlete to run to the top. [2]



- b) What is the work done by the athlete if he climbed just one step of the stairs? [2]

10. Figure below shows Wafi pushing a shopping trolley up a ramp. Calculate the work done by Wafi. [2]
(SPE/2010/Q44bi)



TOPIC 6.5: PRESSURE

1. Pressure is the force per unit area.

TRUE / FALSE

2. Complete the following passage by using the helping words provided. You may use the word once, more than once or none at all. [5]

(SPE/2015/Q41)

force	increase	sinking	pascal
damage	distance	decrease	energy

Pressure is defined as _____ per unit area. The SI unit of pressure is newton per square metre or _____. A force of 18 N acting over an area of 6 m^2 causes a pressure of 3 N/m^2 . If the same force of 18N acts on an area of 3 m^2 , the pressure will _____. It is for this reason the bulldozer have a large surface area to prevent it from _____ easily into the mud or sand. In comparison to a lady's shoe with a high heel, which have a very small area will produce a high pressure thus will _____ the floor.

3. What are the SI units for **Force**, **Energy** and **Pressure**?

(SPE/2011/Q18)

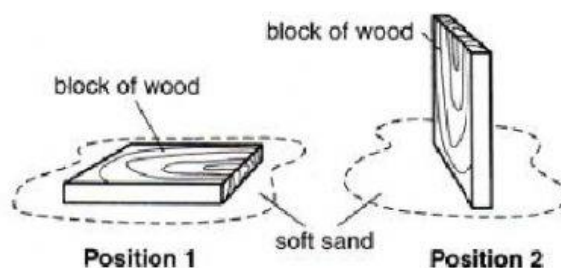
	Force	Energy	Pressure
A.	Watt	Pascal	Joule
B.	Joule	Watt	Newton
C.	Newton	Joule	Pascal
D.	Pascal	Newton	Watt

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4. Figure below shows a block of wood placed on soft sand, first in horizontal position 1, then in vertical position 2. Which of the following correctly compare the force and pressure at position 1 and 2?

(SPE/2013/Q16)

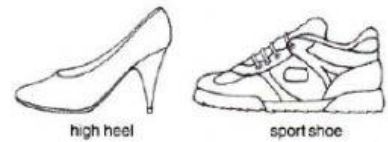
	Force	Pressure
A.	Different	Different
B.	Different	Same
C.	Same	Different
D.	Same	Same


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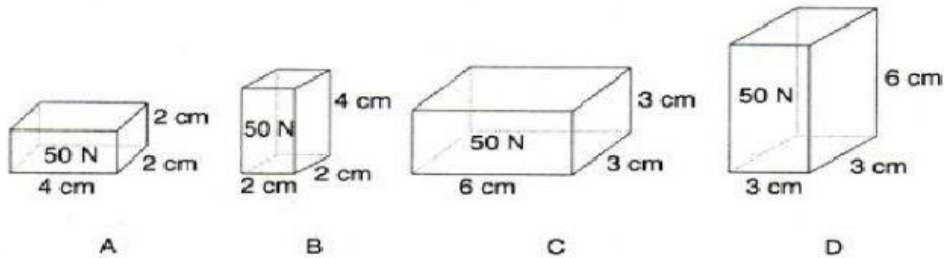
5. Study the diagram below.

Why do high heel shoes damage the floor more than the sport shoes?

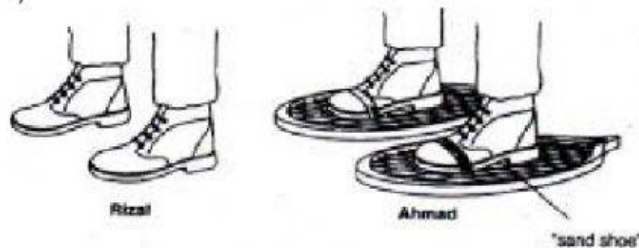
- A. High heel has smaller surface area and produce more pressure.
- B. High heel has smaller surface area and produce less pressure.
- C. High heel has larger surface area and produce more pressure.
- D. High heel has larger surface area and produce less pressure.



6. Which of the following wooden blocks exerts the greatest pressure on the ground?
(SPE/2014/Q17)



7. Study figure below carefully. Rizal and Ahmad are going for a walk on beaches covered by thick soft sands. Rizal is wearing a pair of boots. Ahmad is wearing his boots on 'sand shoe'.
(SPE/2009/Section B Q4b)



Who will be able to walk more easily on the soft sand? Explain your answer. [2]

8. Figure below shows a 25 N block acting on the box.
(SPE/2010/Q44a)

- a) Name the type of force acting on the box. [1]

- b) Calculate the volume of the brick. [1]

- c) Calculate the area of the brick in contact with the floor. [1]

- d) Calculate the pressure exerted by the brick on the floor. [2]

