

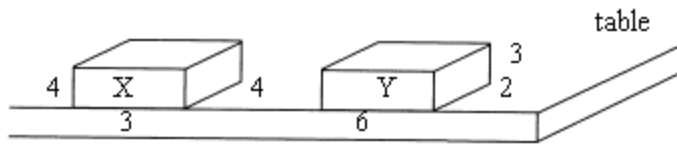
Chapter 14 Dynamics

Paper 1

Answer **all** questions. Each question is followed by four options, **A**, **B**, **C** and **D**. For each question, choose **one** answer only.

1. A student carries a table with a mass of 20 kg for a distance of 2 m. How much work is being done by that student? (Assume $1 \text{ kg} = 10 \text{ N}$)
 - A 5 J
 - B 10 J
 - C 100 J
 - D 400 J
2. A student with a mass of 50 kg climbs a staircase of 3 m height. Calculate the work done by that student. (Assume $1 \text{ kg} = 10 \text{ N}$)
 - A 1 650 J
 - B 1 560 J
 - C 1 500 J
 - D 2 000 J

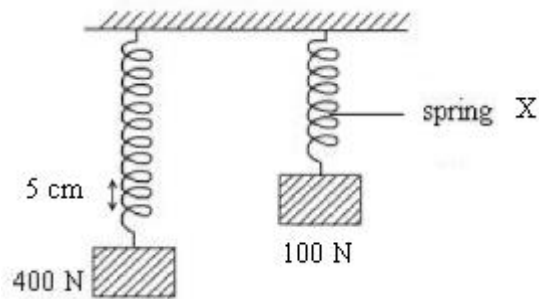
3.



Wooden blocks X and Y in the diagram above have the same mass and contact surface. Among the following forces, which exerts the same magnitude on both blocks?

- A Frictional force
 - B Electrical force
 - C Electrostatic force
 - D Magnetic force
4. 100 J of work is used to push a table over a distance of 5 m. What is the magnitude of the force acting on the table?
 - A 20 N
 - B 50 N
 - C 200 N
 - D 500 N

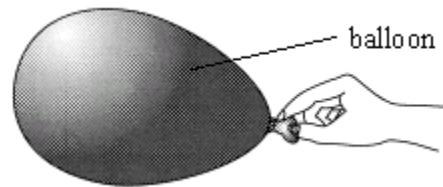
5.



In the diagram above, the spring extends 5 cm when a 400 N load is hooked to it. What is the extension when a 100 N load is hung on X if both the springs are of the same length?

- A 1.00 cm
- B 1.25 cm
- C 1.50 cm
- D 1.75 cm

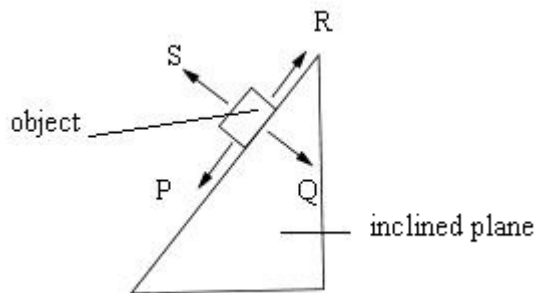
6.



What will be observed when the balloon in the diagram above is released?

Type of force	Observation
A Electrostatic	Turns in a circular motion
B Frictional	Produces a loud sound
C Pull	Stays in a static position
D Push	Moves fast in the opposite direction of the hand

7.



An object is placed on an inclined plane as shown in the diagram above. Among P, Q, R and S, which shows the direction of the frictional force?

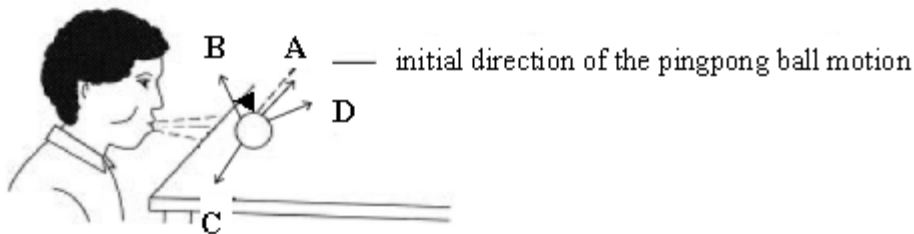
- A P
- B Q

- C R
- D S

8. A worker does 40 J of work by lifting an object from the floor to the top of a cupboard. The height of the cupboard from the floor is 2 m. What is the mass of that object? (Assume that the force of gravity that acts on 1 kg of mass is 10N.)
- A 2 kg
 - B 4 kg
 - C 16 kg
 - D 40 kg
9. A worker carries a 20 kg sack of rice to a height of 3 m in $\frac{1}{2}$ minute. If the weight of the worker is 600 N, how much power does he generate? (Assume that the force of gravity that acts on 1 kg of mass is 10N.)
- A 10 W
 - B 20 W
 - C 60 W
 - D 80 W
10. A boy with a mass of 50 kg carries a school bag of 5 kg up the staircase of 4 m height in 5 seconds. How much power does this boy generate? (Assume that the force of gravity that acts on 1 kg of mass is 10N.)
- A 4 W
 - B 40 W
 - C 400 W
 - D 440 W

Questions 11 and 12 are based on the figure below.

11.

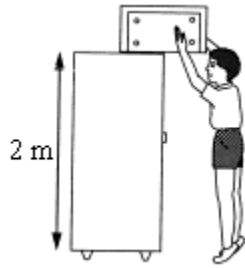


The moving ping-pong ball is blown from the side as shown in the diagram above. Among directions A, B, C and D, which direction will the ping-pong ball move?

12. From this experiment, it can be concluded that force can change
- A the shape of an object
 - B the speed of a moving object

- C the direction of a moving object
- D the position of an object

13.



A student carries a box with a mass of 6 kg from the floor to the top of a cupboard as shown in the diagram above. How much work has he done?

(Assume that the force of gravity that acts on a 1 kg mass = 10 N.)

- A 12 J
- B 60 J
- C 120 J
- D 200 J

14. A worker with a mass of 70 kg carrying a box of 30 kg goes up a slope of 3 m in height. If the time taken by that worker is 50 seconds, what is the power generated by the worker?

(Assume 1 kg = 10 N)

- A 15 W
- B 60 W
- C 100 W
- D 150 W

15. Force is used when

- I a toy car changes the direction of its motion
- II a toy car slows down its motion
- III a stationary toy car starts to move

- A I only
- B I and II only
- C II and III only
- D I, II, and III

16. Among the following, which influences the movement of a wooden block that is pulled on the floor?

- I The surface area that is in contact
- II The weight of the block
- III The contact of surface between the block and the floor

- A I only
- B I and II only
- C II and III only
- D I, II, and III

17. Which of the following involve(s) work being done?

- I A boy stands at the top of the staircase
- II A dog chases a cat
- III A worker pushes a wheelbarrow

- A I only
- B I and II only
- C II and III only
- D I, II, and III

18. The ways to reduce friction include

- I applying grease on the contact surface
- II using ball bearings at the contact surface
- III sprinkling sand on the contact surface

- A I only
- B I and II only
- C II and III only
- D I, II, and III

19. Which of the following statements is **true** about friction?

- I Friction exerts when two surfaces in contact
- II Friction acts at the opposite direction to the force that is being applied
- III Friction depends on the weight of the object that is being pushed

- A I only
- B I and II only
- C II and III only
- D I, II, and III

20. Force can cause the following changes **except**

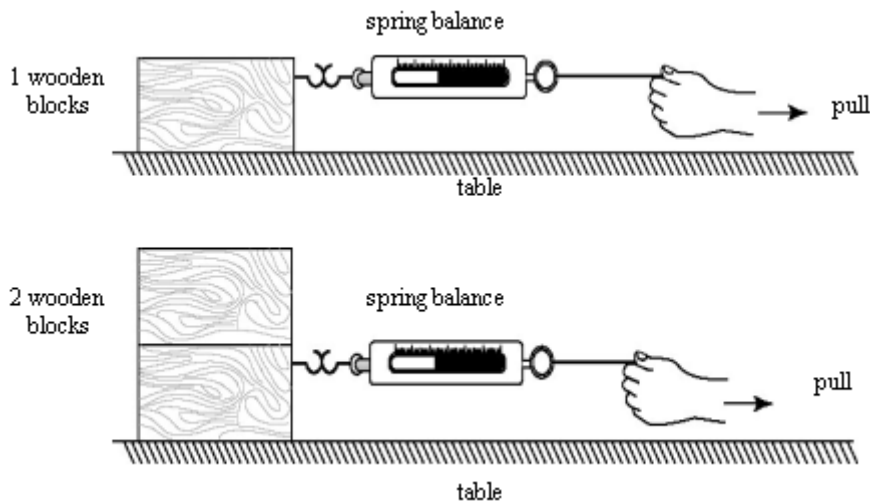
- I weight of objects
- II shape of objects

III speed of moving objects

- A I only
- B I and II only
- C II and III only
- D I, II, and III

Paper 2

Answer the question.



An experiment is set up as shown above to study the frictional force.

The following steps were carried out:

- S1 One wooden block is attached to a spring balance.
- S2 It is pulled across the table.
- S3 The reading on the spring balance is recorded as soon as the wooden block begins to move.
- S4 The experiment is repeated using two wooden blocks.

(a) What is the relationship between the number of wooden blocks and the reading on the spring balance.

(b) State the variables involved in this experiment.

Manipulated variable	
Responding variable	
Constant variable	

(c) The table below shows the readings on the spring balance when two wooden blocks are used.

Object	Reading on the spring balance (N)
One wooden block	
Two wooden blocks	6

Predict the reading on the spring balance if

(i) one wooden block is used

(ii) three wooden blocks are used.

(d) Sketch a graph to show the relationship between the weight of an object and the magnitude of friction produced.



(e) State **one** other factor that influences friction.

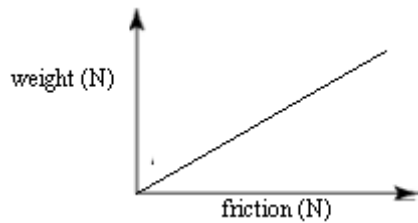
Answers:

Paper 1

1	D	11	D
2	C	12	C
3	A	13	C
4	A	14	B
5	B	15	D
6	D	16	C
7	C	17	C
8	A	18	B
9	D	19	D
10	D	20	A

Paper 2

- (a) The reading of spring balance increases when the number of wooden block increases
- (b) Manipulated variable: Number of wooden blocks
Responding variable: Reading on the spring balance
Constant variable: Type of spring balance/ Type of surface in contact
- (c) (i) 3 N (ii) 9 N
- (d)



- (e) The nature of the surface in contact