CLASS 8 · SCIENCE

Exploring Forces

Sample paper · 15 questions · 22 marks

10 objective questions × 1 mark. Five written-response questions: 12 marks. Write your working where needed. Suggested time: 45 minutes. Answers and marking guidance follow the questions.

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Section A · Objective questions (10 marks)

1. A rickshaw puller setting the rickshaw in motion applies which kind of force?

A. Magnetic force

B. Gravitational force

C. Electrostatic force

D. Muscular force

2. A magnet picks up an iron pin without touching it. This shows that magnetic force is a:

A. Muscular force

B. Frictional force

C. Contact force

D. Non-contact force

3. After combing dry hair, the comb attracts small bits of thread. The force responsible is:

A. Gravitational force

B. Electrostatic force

C. Frictional force

D. Muscular force

4. Raindrops fall towards the ground because gravitational force:

A. Always attracts objects towards the Earth

B. Pushes clouds apart

C. Acts only on metals

D. Works only at night

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5. A potter pressing a lump of clay on the wheel changes the clay's:

A. Smell

B. Weight

C. Shape

D. Colour

6. A bicycle coasting on a flat road gradually slows down even without brakes, mainly because of:

A. The tyres becoming magnetic

B. Friction and air resistance opposing its motion

C. Gravity pushing it backwards

D. Its colour

7. Why is powder sprinkled on a carrom board?

A. To increase friction

B. To make it colourful

C. To reduce friction so the coins slide smoothly

D. To cool the board

8. A suitcase of mass 5 kg is carried to the Moon. Which statement is correct?

A. Its weight doubles

B. Its mass stays 5 kg but its weight becomes smaller

C. Its mass becomes zero

D. Its mass and weight both stay the same

9. A toy boat floats at rest. Its weight is 12 N. What is the upward force of the water on it?

A. 0 N

B. Its mass in kilograms

C. More than 12 N at all times

D. 12 N

10. A swing gradually slows and stops after you stop pumping it. This happens because:

A. No forces act on it

B. Gravity stops at heights

C. Unbalanced forces like friction and air resistance keep acting on it

D. Motion creates no force ever

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Section B · Written responses (12 marks)

Attempt all five. Use a separate sheet if you need more space. The marks for each question are shown.

11. Name three different effects a force can produce, with one new everyday example for each. [2 marks]

12. Classify as contact or non-contact forces: pushing a shopping trolley, a magnet moving a paper clip from a distance, a shoe gripping the floor, the Earth holding the Moon in its path. [2 marks]

13. An equipment trolley needs a larger push on a rough mat than on smooth tiles to maintain the same slow speed. Explain what this suggests about friction, and why the trolley does not speed up at constant speed. [2 marks]

14. A sensor reads an object weight as 18 N in a model environment with gravity one-sixth as strong as Earth. Predict its Earth weight. State whether its mass changes and distinguish mass from weight. [3 marks]

15. A bicycle mechanic oils the chain but keeps the brake pads rough. Explain why one part is made smoother and the other is kept rough. [3 marks]

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Answers & marking guidance

Use these after attempting the paper. Accept equivalent correct reasoning and sensible units. These are Evater model answers, not an official marking scheme.

Section A · 1 mark each

1. D — Force applied using the body's muscles is muscular force, and it needs contact.

2. D — Magnetic force acts across a distance, so it is a non-contact force.

3. B — Rubbing charges the comb, and the charged comb exerts an electrostatic force on light objects.

4. A — Gravity is always attractive; the Earth pulls objects, including raindrops, towards itself.

5. C — A force can change the shape of an object, as pressing and shaping clay shows.

6. B — Friction between the tyres and road, and air resistance, act opposite to the motion and reduce speed.

7. C — Powder makes the surface smoother, reducing friction so the striker and coins glide easily.

8. B — Mass, the amount of matter, does not change with place; weight is gravity's pull, which is weaker on the Moon.

9. D — A floating object at rest is in vertical balance: upward buoyant force equals its weight, 12 N.

10. C — A change in motion always means an unbalanced force is acting; here friction and air resistance slow the swing.

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Section B · Model answers

11. Any three: change speed (pressing brakes slows a scooter), change direction (a fielder deflects a ball), start or stop motion (a push starts a trolley), change shape (stretching a rubber band or squeezing a sponge).

Marking: 2 marks for three effects each with a valid example; 1 mark for two.

12. Contact forces: pushing the trolley and the shoe gripping the floor (friction), because they need touching surfaces. Non-contact forces: the magnet on the paper clip and the Earth holding the Moon (gravity), because they act across a distance.

Marking: 1 mark for the correct split; 1 mark for the touch-versus-distance reasoning.

13. The rough mat produces greater resistance in this comparison. At constant speed, the forward push is balanced by the resisting forces, so there is no resultant force causing acceleration.

Marking: 1 mark for the greater resisting friction on the mat; 1 mark for balanced forces at constant speed.

14. Earth weight would be 6 x18 = 108 N. The mass remains the same: mass measures the amount of matter, while weight is the gravitational force on the object and depends on the local gravitational field.

Marking: 1 mark for 108 N; 1 mark for mass unchanged; 1 mark for distinguishing mass and gravitational force.

15. The chain should move freely, so oiling it reduces friction, preventing wear and saving effort. The brake pads must grip the wheel rim to stop the cycle, so they are kept rough to provide high friction. This shows friction is reduced where motion should be easy and increased where grip or stopping is needed.

Marking: 1 mark for oil reducing chain friction; 1 for rough pads increasing friction for braking; 1 for the general principle.

Topic references

NCERT Class 8 Science, Curiosity, Chapter 5: Exploring Forces.

https://ncert.nic.in/textbook/pdf/hecu105.pdf

Concept reference only. Questions and model answers are original Evater practice material, not an official NCERT paper.

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