



Grade 11



Physical and Chemical Sciences
Force and Motion

Additional FCAT Practice Questions

Directions: Select the best answer for each of the following questions

1. The following are descriptions of the motions of two objects, "W" and "Z".

1. W and Z are both at rest
2. W is at rest and Z is moving east
3. W is moving east and Z is at rest
4. W and Z are both moving east
5. Z circles W and W is at rest
6. W circles Z and Z is at rest

Under which of the descriptions is Z at rest relative to W?

- A. 1 and 3
- B. 1 and 4
- C. 2, 3 and 6
- D. 2, 4 and 5

2. The following are descriptions of the motions of two objects, "W" and "Y".

1. W and Y are both at rest
2. W is at rest and Y is moving east
3. W is moving east and Y is at rest
4. W and Y are both moving east
5. Y circles W and W is at rest
6. W circles Y and Y is at rest

Under which of the descriptions are both W and Y moving relative to each other?

- A. 2, 3 and 6 only
- B. 2, 3 and 5 only
- C. 3, 4 and 5 only
- D. 2, 3, 5 and 6 only

3. Which of the following statements regarding the position of an object is true?

- A. Position of an object is always measured with respect to a reference point
- B. Position of an object is always measured with respect to a displacement
- C. Position of an object is always measured with respect to a another moving object
- D. Position of an object is always measured with respect to a sign post

4. Suppose you are walking at a constant velocity of 6 km/h and a car passes from behind, travelling at 20 km/h. What is the car's velocity relative to you?

- A. 20 km/h
- B. 26 km/h
- C. 14 km/h
- D. 6 km/h

5. Car A, travelling east at 50 km/h, drives by car B travelling on the other side of the road. Car B has a velocity of 40 km/h west. What is the velocity of car A relative to car B?
- A. 50 km/h east
 - B. 90 km/h west
 - C. 90 km/h east
 - D. 10 km/h east
6. A fellow student asks you to check the notes they have made regarding planetary motion in the solar system:
- 1. Planetary paths are ellipses
 - 2. The gravitational force between the Sun and a planet varies inversely with the square of the planet's orbital radius
 - 3. The force between two solar system objects depends on the mass of those objects
 - 4. The square of an planet's orbital period divided by the cube of it's orbital radius is equal to same calculation for any other planet in the solar system

Which of the notes made by the student best describes the gravitational force that occurs between objects in the solar system?

- A. 1, 3 and 4
- B. 2, 3 and 4 only
- C. 1, 2, 3 and 4
- D. 2 and 3 only

7. A student recorded several inferences regarding the law of universal gravitation:
1. Any object with mass will attract another object with gravitational force.
 2. The force of attraction between objects in the solar system is due to magnetism
 3. Under certain circumstances objects can repel each other with gravitational force
 4. The gravitational force exerted by the Sun on a planet is the same as the gravitational force of the planet exerted on the Sun

Which of the student's inferences regarding universal gravitation are correct?

- A. 1 and 4 only
 - B. 2 and 4 only
 - C. 1 only
 - D. 4 only
8. After a long study of our solar system, Wilson came to these conclusions:
1. The gravitational force between a particular planet and the Sun varies inversely with the distance squared between them.
 2. The gravitational force exerted on a particular planet by the Sun is proportional to the mass of the Sun.
 3. The gravitational force between a particular planet and the Sun is proportional to the product of their masses.
 4. The gravitational force exerted on the Sun by a certain planet is proportional to the mass of that certain planet.

Which of Wilson's conclusions regarding gravitational force are correct?

- A. 3 and 4 only
- B. 1 and 2 only
- C. 2 and 3 only
- D. 1, 2, 3 and 4

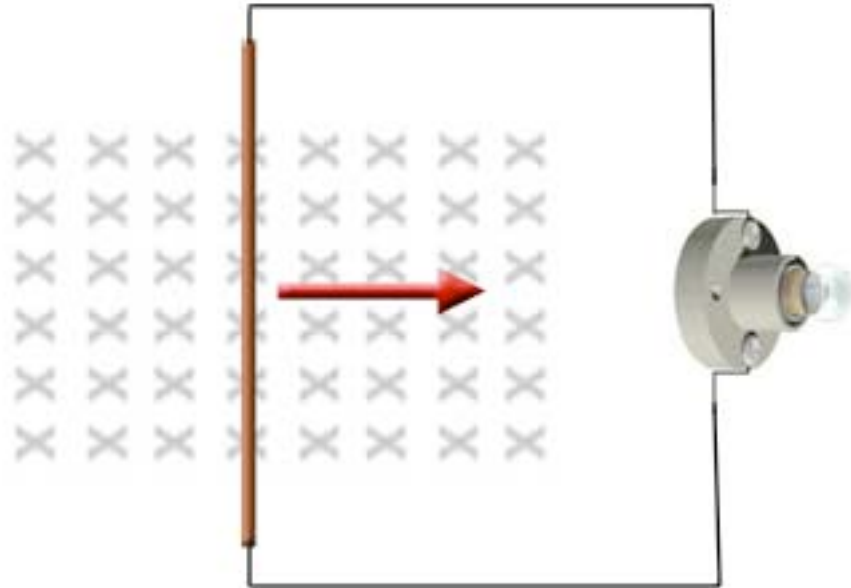
9. The gravitational force between two objects is M . If the mass of either of the objects is doubled, what will the new magnitude of the gravitational force?
- A. $4M$
 - B. $2M$
 - C. $0.25M$
 - D. $0.5M$
10. The gravitational force between two objects is M . If the mass of either of the objects is halved, what will the new magnitude of the gravitational force?
- A. $4M$
 - B. $2M$
 - C. $0.5M$
 - D. $0.25M$
11. Consider a certain amount of current flowing in a conductor from point W to Z.



If the current in the conductor is doubled, what would happen to the magnetic field strength at point P?

- A. The magnetic field strength would be cut in half
- B. The magnetic field strength would stay the same
- C. The magnetic field strength would double
- D. The magnetic field strength would be cut to a quarter of its original value

12. A conducting rod is placed in a magnetic field (represented by Xs in the diagram) and connected to a light bulb.



- What must occur in order for the bulb to light up?
- A. The rod must be moved at a constant velocity in the magnetic field in the direction of the arrow
 - B. The rod must be accelerated in the magnetic field in the direction of the arrow
 - C. The rod must be kept motionless in the magnetic field
 - D. The rod must be disconnected from the bulb
13. An electromagnet is created when an electric current is passed through a coil of copper wire. Which of the following would be best to increase the strength of the electromagnet?
- A. Increase the amount of current flowing in the wire
 - B. Decrease the amount of current flowing in the wire
 - C. Shorten the amount of wire in the coil
 - D. Replace the wire in the coil with thicker wire

14. A hand-held generator lights a bulb when the handle is turned.



What is the most likely reason for the lighting of the bulb?

- A. Turning the handle moves a wire coil in a magnetic field
 - B. Turning the handle causes a wire coil to heat up
 - C. Turning the handle rapidly connects and disconnects a wire coil
 - D. Turning the handle makes a wire coil wrap tighter and tighter
15. The aurora borealis (also known as the northern lights) is a beautiful glow that occurs because of charged particles from space striking the Earth's atmosphere.



The aurora effect only occurs near the north and south magnetic poles of the Earth. Which of the following is the best explanation why the aurora occurs at the Earth's magnetic poles?

- A. The magnetic field of the Earth causes charged particles from space to move toward the poles
- B. The heat at the equator repels charged particles
- C. Electricity flowing in the Earth's crust attracts charged particles to the poles
- D. The magnetic field of the Earth gets stronger when charged particles from space strike it

Answers

1. B
2. D
3. A
4. C
5. C
6. D
7. A
8. D
9. B
10. C
11. C
12. B
13. A
14. A
15. A