Physics
Universal Gravitation, Form: A

Name: _____
Date: _____
Period: _____
Primary Peer Reviewer: _____

+1	0	-1	Σ

Section 1. Multiple Choice

For Each question, choose the best answer.
Some Formulas:

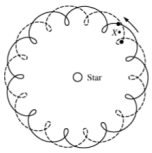
$$F_c = \frac{mv^2}{r} \qquad F_g = \frac{Gm_1m_2}{r^2} \qquad G = 6.67 \times 10^{-11} Nm^2/kg^2$$

1. Newton's theory of Universal Gravitation states that the Earth has gravity because -
   (a) it has a large mass
   (b) it is moving quickly
   (c) it has a magnetic field
   (d) it has a thick atmosphere

2. A planet is discovered that has twice the mass and twice the radius of Earth. What weight would a person who weighs 900 N on Earth have on this planet?
   (a) 225 N
   (b) 450 N
   (c) 900 N
   (d) 1800 N
   (e) 3600 N

3. Planet X has twice Earth's mass and three times Earth's radius. The magnitude of the gravitational field near Planet X's surface is most nearly
   (a) 2 N/kg
   (b) 7 N/kg
   (c) 10 N/kg
   (d) 20 N/kg

4. The mass of the earth is 5.972×10^{24} kg. The mass of Venus is 4.867×10^{24} kg. If earth and venus are 1.5×10^{11} m apart, what is the force of Earth's gravity on Venus?
   (a) 0 N
   (b) 8.616×10^{16} N
   (c) 4.216×10^{-14} N
   (d) 1.292×10^{28} N

5. 

The figure above represents the orbits of two planets of equal mass that orbit their star in the counter-clockwise direction as a double-planet system. From the point of view of an observer on either planet, the planets appear to orbit each other while also orbiting the star. The dots on the orbits represent the position of the planets at time t_0, and X is the position of their center of mass at that time. Which of the following arrows best represents the acceleration of the center of mass of the double-planet system when it is at point X?

(a) ↖
(b) ↙
(c) ↗
(d) ↘

Section 2. True or False

_____ 9. The Sun's gravity pulls on the Earth more than the Earth's gravity pulls on the Sun.

_____ 10. The Moon has no gravity.

_____ 11. A planet's gravity is caused by its atmosphere alone.

_____ 12. Planets distant from the Sun have less gravity.

_____ 13. Gravity is stronger between the most distant objects.

_____ 14. Space shuttle astronauts are weightless because there is no gravity above earth.

_____ 15. Planets revolve around the sun because they are pushed by gravity.

_____ 16. The gravitational field of the Earth is infinite in size.

Answer Key for Exam A

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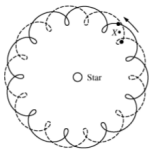
5. 

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