## PracTest PHY. 03 - Circular Motion and Gravity

## True/False

Indicate whether the statement is true or false.

1. [Mechanical Universe-Apple \& Moon] The zero $g$ (weightlessness) experienced by astronauts in orbit around the moon is due to the absence of gravity.
A. True
B. False

## Multiple Choice

Identify the choice that best completes the statement or answers the question.
2. An object in uniform circular motion has
A. a constant magnitude of acceleration
D. constant speed
B. constant orbital radius
E. all of these
C. constant magnitude of force
F. none of these
3. The force needed to keep an Olympic bobsled in a circular path as it makes a turn on the icy track is provided by a component of
A. centripetal
D. inertia
B. friction
E. lift
C. normal
F. weight (gravitational force)
4. The force needed to keep a bird in a circular path as it makes a turn is provided by a component of
A. centripetal
D. inertia
B. friction
E. lift
C. normal
F. weight (gravitational force)

The particle shown to the right is traveling clockwise in uniform circular motion.

5. The velocity of the particle shown above is in which direction?
A. A
B. B
C. C
D. D
E. E
6. If the force that keeps the object in circular motion suddenly ceases, the particle will travel in which direction?
A. A
C. C
E. E
B. B
D. D
F. it continues in the circle
7. The net force acting on the particle shown above is in which direction?
A. A
B. B
C. C
D. D
E. E

A mass $m$ is whirled around in circular motion. The radius of the circle is $r$, the speed of the mass is $v$, and the centripetal force (tension in the string) is $F$.
8. If the mass were doubled, the force required to maintain UCM would be
A. F/4
B. $\mathrm{F} / 2$
C. F
D. 2 F
E. 4 F
9. If the radius and speed were doubled, the force required to maintain UCM would be
A. F/2
B. F
C. 2 F
D. 4 F
E. 8 F
10. The person who measured the value of the universal gravitation constant: $G=6.67 \times 10^{-11} \mathrm{~N} \cdot \mathrm{~m}^{2} / \mathrm{kg}^{2}$.
A. Tycho Brahe
D. Ptolemy
G. Aristotle
B. Kepler
E. Galileo
H. Henry Cavendish
C. Newton
F. Copernicus
11. Ptolemy
A. developed the geocentric model of epicycles and deferents to account for the retrograde motion of Mars.
B. built and maintained a state-of-the-art observatory in Denmark.
C. used mathematics and reasoning to develop the theory of universal gravitation.
D. plotted and analyzed the orbits of the planets and developed three laws of planetary motion.
E. proposed the "crystalline spheres" geocentric model of the heavens.
F. proposed the heliocentric model of the heavens in the sixteenth century.
12. Harmony of the Worlds and The Mystery of the Universe were written by
A. Aristotle
C. Newton
E. Galileo
B. Kepler
D. Ptolemy
F. Copernicus
13. If the moon were only half as far from the Earth as it is now, the gravitational force it exerts on the Earth would be
A. one-fourth its present value
D. twice its present value
B. one-half its present value
E. four times its present value
C. equal to its present value
14. On a planet with twice the radius and twice the mass of the Earth, your weight would be equal to your weight on Earth times a factor of
A. $1 / 4$
B. $1 / 2$
C. 1
D. 2
E. 4
F. 8
15. [Mechanical Universe-Kepler's Laws] What curve fit the precise plot of Mars' orbit?
A. Circle
B. Oval
C. Ellipse
D. Cycloid
16. A 2 kg ball moves in a circle 3 m in radius at a speed of $5 \mathrm{~m} / \mathrm{s}$. The centripetal force acting on it is
A. 1.1 N
B. 3.3 N
C. $\quad 3.6 \mathrm{~N}$
D. 6.7 N
E. $\quad 17 \mathrm{~N}$
17. [CPA-Gravity I] A certain gravitational force $F$ exists between two planets having masses $m_{l}$ and $m_{2}$ and a distance $d$ between them. What is the force if both masses are doubled?
A. one fourth as much
B. half as much
C. twice as much
D. four times as much
18. [One Voice in the Cosmic Fugue] The Heiki Crab in Japan is a textbook example of
A. a species driven to extinction by human negligence
B. natural selection
C. a transitional species in an evolutionary thread
D. artificial selection

# PracTest PHY. 03 - Circular Motion and Gravity Answer Section 

## TRUE/FALSE

1. ANS: F TOP: MU-The Apple and the Moon

## MULTIPLE CHOICE

2. ANS: E
3. ANS: C
4. ANS: E
5. ANS: C
6. ANS: C
7. ANS: E
8. ANS: D
9. ANS: C
10. ANS: H
11. ANS: A
12. ANS: B
13. ANS: E
14. ANS: B
15. ANS: C
16. ANS: E
17. ANS: D
18. ANS: D

TOP: Tangential NOT: PF
TOP: Centripetal Force
TOP: Centripetal Force
TOP: UCM Directions
TOP: UCM Directions
TOP: UCM Directions
TOP: F-mv2/r Props
TOP: F-mv2/r Props
TOP: History NOT: PT
TOP: History NOT: PT
TOP: History NOT: PT
TOP: Grav Prop Vary Distance NOT: PT
TOP: Grav Prop Vary Mass \& Radius NOT: PT
TOP: MU-Kepler's Laws
TOP: F-mv2/r NOT: PF
TOP: 13. Gravity I
TOP: 102

NOT: PT
NOT: PT
NOT: PT
NOT: PT

