🏠   Course Materials   CHAPTER 4: GRAVITY AND ORBITS
Review Test Submission: 4 CHAPTER QUIZ

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User	Wenyin San
Course	1501_Stars Galaxies and the Universe [1501_ASTR_1960_00]
Test	4 CHAPTER QUIZ
Started	2/9/15 11:39 PM
Submitted	2/9/15 11:48 PM
Due Date	2/10/15 10:00 AM
Status	Completed
Attempt Score	3 out of 25 points
Time Elapsed	9 minutes.
Instructions	

Question 1
1 out of 1 points

Gravity is responsible for

Selected Answer: ✅ d. All the possible answers are correct.

Correct Answer: ✅ d. All the possible answers are correct.

Response Feedback: FEEDBACK: Gravity causes matter to be gathered into planets and it causes objects to orbit each other (page 90).

Question 2
0 out of 1 points

Who is responsible for Newton's First Law?

Selected Answer: ❌ a. Newton

Correct Answer: ✅ c. Galileo

Response Feedback: FEEDBACK: Galileo added to Aristotle's teaching that an object at rest remains at rest by stating that an object left in motion remains in motion unless acted on by an unbalanced force. This was restated as Newton's First Law (page 90).

Question 3
1 out of 1 points

The gravitational force between you and Earth depends on

Selected Answer: ✅ d. All the possible answers are correct.

Correct Answer: ✅ d. All the possible answers are correct.

Response Feedback: FEEDBACK: The attractive force of gravity between two objects is proportional to the product of their masses (page 92).

Question 4

1 out of 1 points

If the Earth were twice as far from the Sun as it is now, the gravitational force between Earth and the Sun would be

Selected Answer: ✅ c. 0.25 times as great.

Correct Answer: ✅ b. 0.25 times as great.

Response Feedback: FEEDBACK: The force of gravity is inversely proportional to the square of the distance between the two objects. If the distance between Earth and the Sun is doubled, the force of attraction will be only one fourth as great (page 94). See also, *Gravity Algebra* and *Newton's Law of Gravity Calculator.*

Question 5

0 out of 1 points

Which of these does NOT determine the acceleration of a falling body on Earth?

Selected Answer: ❌ [None Given]

Correct Answer: ✅ b. the mass of the falling body

Response Feedback: FEEDBACK: All freely falling objects accelerate toward Earth at the same rate regardless of their mass (page 94).

Question 6

0 out of 1 points

Which of the following relationships is most true?

Selected Answer: ❌ [None Given]

Correct Answer: ✅ b. Newton's law of gravitation explains Kepler's laws.

Response Feedback: FEEDBACK: Newton's law of universal gravitation predicts the empirical laws that Kepler articulated (page 97).

Question 7

0 out of 1 points

Astronauts in orbit around Earth feel weightless because

Selected Answer: ❌ [None Given]

Correct Answer: ✅ a. they are falling around Earth.

Response Feedback: FEEDBACK: The astronauts (and their spacecraft) are falling around Earth together. They never land on Earth's surface because Earth curves beneath them. They feel weightless, but it is really that Earth still exerts a force on them and keeps them in a state of free fall as they orbit (page 98).

Question 8

0 out of 1 points

Knowing Earth's orbital speed and its distance from the Sun, one can calculate the

Selected Answer: ❌ [None Given]

Correct Answer: ✅ a. mass of the Sun.

Response Feedback: FEEDBACK: Kepler's Third Law applied to circular orbits shows that the square of the period of an orbit is equal to the cube of the radius of the orbit multiplied by a constant that includes the mass of the Sun (page 100).

Question 9

0 out of 1 points

"Escape velocity" refers to the velocity

Selected Answer: ❌ [None Given]

Correct Answer: ✅ c.
required for an object to escape a planet's gravity.

Response Feedback: FEEDBACK: Escape velocity is the lowest velocity necessary for an object to enter a parabolic orbit and not return to a planet (page 102).

Question 10

0 out of 1 points

Which orbit is NOT a bound orbit around the Earth?

Selected Answer: ❌ [None Given]

Correct Answer: ✅ a. All the possible answers are correct.

Response FEEDBACK: Bound orbits are closed curves called ellipses.

Feedback: Unbound orbits are either parabolas or hyperbolas (page 102). See also, *Elliptical Orbits.*

Question 11

0 out of 1 points

We apply Newton's law of gravitation to

Selected Answer: ❌ [None Given]

Correct Answer: ✅ d. All the possible answers are correct.

Response Feedback: FEEDBACK: Newton's law of gravity is "universal." It applies to all objects in the universe (page 103).

Question 12

0 out of 1 points

An ellipse has

Selected Answer: ❌ [None Given]

Correct Answer: ✅ b. 2 foci.

Response Feedback: FEEDBACK: An ellipse is a mathematical curve based on the positions of two points called foci. The farther apart the foci, the more elongated is the ellipse (page 99). See also, *Elliptical Orbits* and *Planetary Orbit Simulator*

Question 13

0 out of 1 points

Jupiter takes longer to move around the Sun than Earth does because

Selected Answer: ❌ [None Given]

Correct Answer: ✅ c. it has farther to go.

Response Feedback: FEEDBACK: Kepler's Third Law states there is a simple mathematical relationship between the orbital period of a planet and the size of the orbit. This relationship means that if a planet is farther from the Sun, it must have a longer period of orbit (page 99). See also, *Planetary Orbit Simulator*.

Question 14

0 out of 1 points

If two objects are dropped from the same height, which of the following outcomes will most likely take place if friction is negligible?

Selected Answer: ❌ [None Given]

Correct Answer: ✅ d. Both objects will land at the same time.

Response
Feedback:
FEEDBACK: Since both objects experience the same acceleration due to the gravity of Earth, they should fall at the same rate and hit the ground at the same time (page 90).

Question 15
                                                                                        0 out of 1 points

Which of the following is a type of force?

Selected Answer: ❌ [None Given]

Correct Answer: ✅ b. weight

Response
Feedback:
FEEDBACK: Weight is the force of gravity on an object (page 92).

Question 16
                                                                                        0 out of 1 points

At which location would the acceleration due to gravity have the greatest value?

Selected Answer: ❌ [None Given]

Correct Answer: ✅ d. at either pole

Response
Feedback:
FEEDBACK: The acceleration due to gravity is inversely proportional to the distance squared from the center of Earth; since the poles are closest to the center of Earth, the value is greatest there (page 93).

Question 17
                                                                                        0 out of 1 points

What is the mutual gravitational attraction that occurs among all parts of the same object called?

Selected Answer: ❌ [None Given]

Correct Answer: ✅ c. self-gravity

Response
Feedback:
FEEDBACK: It is self-gravity that causes large enough masses to be shaped into spheres and causes objects dropped near the surface to fall toward the center of the sphere (page 96).

Question 18

If the space shuttle wanted to get from a lower circular orbit (close to Earth) to a higher circular orbit (farther from Earth), what would it have to do?

0 out of 1 points

Selected Answer: ❌ [None Given]

Correct Answer: ✅ a. speed up, then slow down

Response Feedback: FEEDBACK: First the shuttle would have to speed up to transition from a circular orbit to an elliptical orbit that moves it farther away from Earth; then, when at the desired distance from Earth, it will slow down to maintain a new circular orbit (page 101). See also, *Newton's Laws and Universal Gravitation* and *Planetary Orbit Simulator.*

Question 19

0 out of 1 points

If both Earth and the Sun were double their masses, the gravitational force between Earth and the Sun would be

Selected Answer: ❌ [None Given]

Correct Answer: ✅ b. 4 times as great.

Response Feedback: FEEDBACK: The force of gravity is proportional to the product of the two objects' masses. If both masses doubled, the force of attraction will be 2 x 2 = 4 times as great (pages 93–94). See also, *Gravity Algebra* and *Newton's Law of Gravity Calculator.*

Question 20

0 out of 1 points

If an object is moving around Earth at 10 km/s at a particular instant in time, what type of orbit could it have?

Selected Answer: ❌ [None Given]

Correct Answer: ✅ b. circular

Response Feedback: FEEDBACK: As long as the object is traveling between 8 km/s (minimum speed for an orbit around Earth) and 11 km/s (the escape speed from Earth), it will be in either a circular or elliptical orbit (pages 98–99). See also, *Newton's Laws and Universal Gravitation* and *Planetary Orbit Simulator* .

Question 21

0 out of 1 points

At which phases of the Moon are the tides most pronounced?

Selected Answer: ❌ [None Given]

Correct Answer: ✅ c.

Actually, the size of the tides do not depend upon the phases of the Moon.

Response Feedback: FEEDBACK: Tides are most pronounced when Earth, the Sun, and the Moon are all colinear, which corresponds to full and new moon phases (page 104). See also, *Tides and the Moon.*

Question 22

0 out of 1 points

About what value is the ratio for the tidal force from the Moon on Earth to the tidal force from the Sun on Earth?

Selected Answer: ❌ [None Given]

Correct Answer: ✅ c. 2

Response Feedback: FEEDBACK: Since the tidal "force" depends on the differences between how much gravity pulls on one part of Earth in comparison to the pulls on other parts of Earth, the Moon's close proximity gives it the greater tidal force on Earth (page 105). See also, *Tides and the Moon.*

Question 23

0 out of 1 points

How many high tides does a coastal city experience each day?

Selected Answer: ❌ [None Given]

Correct Answer: ✅ d. 2

Response Feedback: FEEDBACK: As locations on Earth, including coastal cities, rotate through a tidal bulge, they experience high tide; and since there are two tidal bulges, there are two high tides (page 106). See also, *Tides and the Moon* and *Tidal Bulge Simulator* .

Question 24

0 out of 1 points

What is the ratio of the rotational period of the Moon (a lunar day) to the sidereal period of the Moon around Earth (a lunar month)?

Selected Answer: ❌ [None Given]

Correct Answer: ✅ d. 1

Response
Feedback:

FEEDBACK: The rotational period of the Moon (a lunar day) is equal to the sidereal period of the Moon around Earth (a lunar month) because the Moon is tidally locked with Earth; we observe this because we see only one side of the Moon at all times (page 108). See also, *Tides and the Moon* and *Tidal Bulge Simulator* .

Question 25

0 out of 1 points

What do we call the distance at which a planet's tidal forces exceed the self-gravity of a smaller object?

Selected Answer: ❌ c. tidal limit

Correct Answer: ✅ c. roche limit

Response
Feedback:

FEEDBACK: Luckily for Earth, the Moon formed just outside the Roche limit for Earth (and has been steadily receding ever since); if it hadn't, Earth would probably have a large and elegant ring system like Saturn (page 109). See also, *Tides and the Moon.*

Monday, February 9, 2015 11:48:51 PM EST

← OK