Team No. Key

All questions are worth 1 point, unless noted otherwise.

Part 1. Fill in the blank or short answer

No.	Question	Answer(s)
1.	Name the four geological processes that shape planetary surfaces (4 pts).	(a) volcanism or volcanoes (b) tectonics or plate tectonics (c) impact craters (d) erosion
2.	Name the three processes that heated the planetary interiors (3 pts).	(a) differentiation (b) accretion (c) radioactivity
3.	When observing the night sky, you can sometimes find planets along the (a)_____ in one of the (b)_____ constellations. (2 pts)	(a) ecliptic (b) zodiac
4.	The most abundant elements in the solar system are (a)_____ and (b)_____. (2 pts)	(a) Hydrogen (b) helium
5.	The boundary line in the solar nebula beyond which ices could condense is called the _____; only metals and rocks could condense within it.	frost line
6.	When planets begin to melt, the materials in them begin to separate from one another. The heaviest materials sink to form the core. Lower density materials rise to form the crust. This process is called _____.	differentiation

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No.	Question	Answer(s)
7.	According to the Giant Impact Hypothesis, the large object called _____ hit Earth a long time ago causing the Earth's axis to tilt and leading to the formation of the Moon.	Theia
8.	Name the three ways in which moons can form (3 pts).	(a) capture (b) formed in disk that swirls around forming planets (c) impact
9.	Which of Kepler's Laws compares the orbital period and radius of orbit of a planet to those of other planets?	Law of Harmonies / 3rd law
10.	Which two of Kepler's Laws describe motion characteristics of a single planet? (2 pts)	(a) Law of Ellipses (1st law) (b) Law of equal areas (2nd law)
11.	Assume a planet takes 8 years to orbit the Sun. Find its distance from the Sun in AU. Show your work. (2 pts) $T^2 = r^3$ where T = period in years, r = semi major axis in AU $(T*T) = (r * r * r)$ $8 * 8 = (r * r * r)$ $64 = (r * r * r)$ $4 = r$, r = 4 AU	
12.	What is syzygy? (2 pts) Around new moon and full moon when the Sun, Moon, and Earth form a line (a configuration known as a syzygy). Alignment in a straight line of three celestial bodies bound by gravity.	

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No.	Question	Answer(s)
13.	Explain spring tide. (2 pts)	When the earth, moon, and sun line up—which happens at times of full moon or new moon—the lunar and solar tides reinforce each other, leading to more extreme tides, called spring tides.
14.	_____are the rise and fall of sea levels caused by the combined effects of the gravitational forces exerted by the Moon and the Sun and the rotation of Earth	Tides
15.	When the Moon is at (a)_____ or third quarter, the Sun and Moon are separated by 90° when viewed from the Earth, and the solar tidal force partially cancels the Moon's. At these points in the lunar cycle, the tide's range is at its minimum; this is called the (b)_____. (2 pts)	(a) first quarter (b) neap tide
16.	Some shorelines experience a (a)_____— two nearly equal high and low tides each day. Other locations experience a (b)_____— only one high and low tide each day. A (c)_____ -- two uneven tides a day, or one high and one low — is also possible. (3 pts)	(a) semi-diurnal tide (b) diurnal tide (c) mixed tide
17.	Why doesn't Venus experience noticeable seasons?	With an axial tilt of just 3 degrees, Venus spins nearly upright, and so does not experience noticeable seasons.

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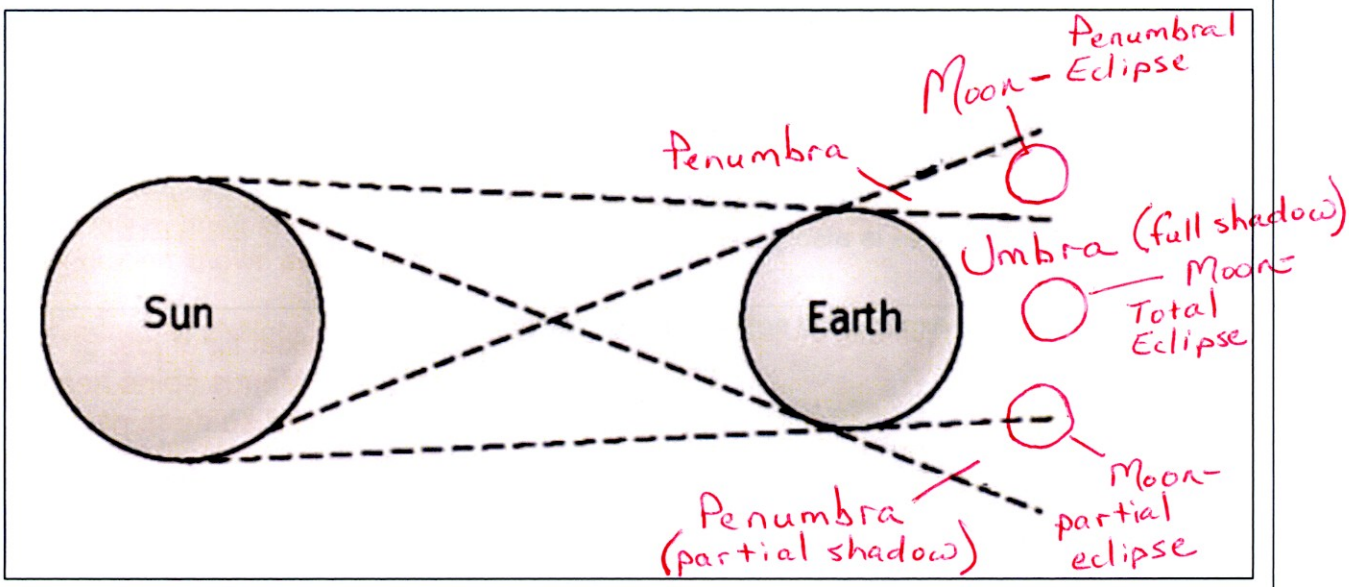
No.	Question	Answer(s)
18.	Venus has these two highland areas (a)_____ and (b)_____. (2 pts)	(a) Ishtar Terra (b) Aphrodite Terra
19.	Why is Venus' magnetic field much weaker than the Earth's?	Slow rotation
20.	Who is Mercury named after?	Mercury is named for the Roman messenger god.
21.	Phobos means (a)_____, and Deimos means (b)_____. Fitting names for the sons of a war god. (2 pts)	(a) Fear or panic or phobia (b) Flight or running away
22.	Name one requirement for a planet to have a global magnetic field.	An interior region of electrically conducting fluid (gas or liquid) such as molten metal OR Convection in that layer of fluid OR Moderately rapid rotation
23.	Complete the diagram of lunar eclipses below. Draw and label the Moon for the three different types of lunar eclipses. Label the regions of shadow. (8 pts)	



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Part 2. True or False

No.	Question	Answer (true or false)
24.	The waning crescent moon rises at about 3 am and sets at about 3 pm.	true
25.	In order to be classified as a planet, a body must only meet two criteria: (1) It orbits a star, but is itself not a star or a moon. (2) It is massive enough for its own gravity to give it a nearly round shape.	false
26.	All of the outer planets have rings.	true
27.	When the Moon is at apogee, it is at its closest point to Earth.	false
28.	Mars does not experience seasons.	false
29.	Due to the effects of libration, we can see about 75% of the Moon's surface from Earth.	false
30.	Io's atmosphere is about 95% carbon dioxide and about 3% nitrogen.	false
31.	The Sun contains 89.9% of all the mass of the solar system.	false
32.	If an imaginary line were drawn from the earth to the sun, then the area swept out by the line in every 31-day month would be the same.	true
33.	A circle is the special case of an ellipse in which the two foci are at the same location.	true
34.	The Law of Harmonies states that the ratio of the cubes of the periods to the squares of their average distances from the sun is the same for every one of the planets.	false
35.	There is about a seven-day interval between springs and neaps.	true

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No.	Question	Answer (true or false)
36.	When crater rays form, the fine particles of crushed rock are more reflective than large pieces, so the rays look brighter.	true
37.	Like Earth's Moon, Phobos and Deimos always present the same face to their planet.	true
38.	The thickness of the lithosphere is closely related to a planet's size: small planets tend to have thicker lithospheres.	true

Part 3. Short answer or fill in the blank. Refer to the images on page 2.

No.	Question	Answer
39.	What is shown in Figure 1 (on the cover), in this case involving Mercury?	transit
40.	Which body is shown in Figure 2?	Jupiter
41.	This image (Figure 2) was taken by NASA's current _____ spacecraft and published on Time.com on May 25, 2017.	Juno
42.	Which body is shown in Figure 3?	Io
43.	The body shown in Figure 3 is the most (a)_____ place in the solar system.	volcanically active
44.	Which type of eclipse shown in Figure 4? (2 pts)	Annular solar

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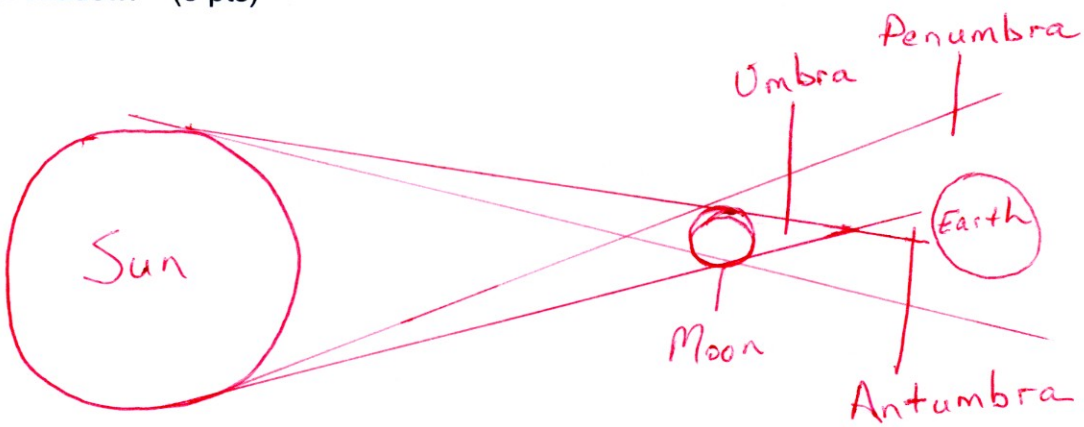
No.	Question	Answer
45.	Draw and label the Sun, Moon, and Earth during this type of eclipse. Also draw and label the regions of shadow. (8 pts)  Full credit for any 2 regions of shadow labeled.	
46.	Which body is shown in Figure 5?	Mars
47.	Name two of the features shown in the yellow circle in Figure 5. (2 pts)	Any two of these: Olympus Mons Ascraeus Mons Tharsis Montes Arsia Mons Tharsis region
48.	Which body is shown in Figure 6?	Deimos
49.	What type of body is this (in Figure 6)?	Moon or natural satellite
50.	Which spacecraft obtained this image?	Mars Reconnaissance Orbiter
51.	Which body is shown in Figure 7?	Ceres
52.	What type of body is this (in Figure 7)?	asteroid or dwarf planet

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No.	Question	Answer
53.	This image (Figure 7) was taken on September 20, 2017 by NASA's _____ spacecraft.	Dawn
54.	Which body is shown in Figure 8?	Venus
55.	The climate orbiter that took this picture (Figure 8) entered the orbit about this body in December 2015. Name the orbiter.	Akatsuki
56.	Which body is shown in Figure 9?	Moon
57.	This image (Figure 9) was acquired on December 7, 1992, by a spacecraft that was on its way to explore the Jupiter system in 1995–97. Name the spacecraft.	Galileo

Part 4. Multiple Choice

No.	Question	Answer
58.	Which of the following moons has a retrograde orbit? a. Io b. Titan c. Triton d. Iapetus	c. Triton
59.	Our solar system has two different types of planets -- rocky planets and gas giants -- because the _____ across the protoplanetary disk was not uniform. a. density b. temperature c. pressure d. all of the above	b. temperature

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No.	Question	Answer
60.	The _____ is the relatively rigid outer layer of a planet; it generally encompasses the crust and the uppermost portion of the mantle. a. core b. regolith c. lithosphere d. tectonic plate	c. lithosphere
61.	The uppermost region of the atmosphere, which gradually fades away into space is called the _____. a. mesosphere b. thermosphere c. exosphere d. stratosphere	c. exosphere
62.	Gases that are particularly good at absorbing infrared light are called greenhouse gases. Examples of greenhouse gases are: a. water vapor (H_2O), carbon dioxide (CO_2), and methane (CH_4) b. carbon dioxide (CO_2), oxygen molecules (O_2), and nitrogen molecules (N_2) c. methane (CH_4), argon (Ar), and helium (He) d. water vapor (H_2O), methane (CH_4), and oxygen molecules (O_2)	a. water vapor (H_2O), carbon dioxide (CO_2), and methane (CH_4)
63.	Which mission became the first artificial satellite of Mars? a. MESSENGER b. Mariner 9 c. Mars Observer d. Mars Climate Orbiter	b. Mariner 9
64.	What was the purpose of the Magellan mission to Venus? a. Radar mapping mission b. Orbiter and lander c. Flyby d. Rover	a. radar mapping mission

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No.	Question	Answer
65.	NEAR Shoemaker was NASA's mission to orbit and land on _____. a. Pluto b. Ceres c. Vesta d. Eros	d. Eros
66.	_____ is a layer of loose rock, rocky fragments, and dust that covers the surface of a planet or planetary satellite. a. Crust b. Lithosphere c. Topsoil d. Regolith	d. Regolith
67.	Some bodies in the solar system may have _____, which erupt volatile liquids like water and ammonia, instead of molten lava. a. shield volcanoes b. stratovolcanoes c. cryovolcanoes d. cinder cone volcanoes	c. cryovolcanoes
68.	The _____ is a spherical distribution of trillions of icy planetesimals and cometary nuclei that surrounds the solar system and extends out to a radius of about 1.6 light-years from the Sun. a. Kuiper Belt b. Oort Cloud c. Asteroid Belt d. Local Group	b. Oort Cloud
69.	Spring Tides happen during _____ and _____ moons and neap tides happen during _____ moons. a. Gibbous, Crescent, Quarter b. 1st Quarter, 3rd Quarter, New c. Full, New, Quarter d. Full, New, Crescent	c. Full, New, Quarter

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No.	Question	Answer
70.	Neap is an Anglo-Saxon word meaning _____. a. weak woman b. tiny river c. without the power d. thirsty child	c. without the power
71.	The _____ mission in the early 1990s mapped 98 percent of Venus' surface. a. Magellan b. Venus Express c. Akatsuki d. Mariner 2	a. Magellan
72.	Mercury's surface gravity is about _____% of that on Earth. a. 10% b. 38% c. 52% d. 83%	b. 38%
73.	What is the diameter of Deimos? a. 2 miles b. 7.5 miles c. 15.3 miles d. 23.1 miles	b. 7.5 miles
74.	Deimos orbital period is approximately a. 10 hours, 3 minutes b. 5 days, 3 hours, 42 minutes c. 11 days, 2 hours, 10 minutes d. 1 day, 6 hours, 17.9 minutes	d. 1 day, 6 hours, 17.9 minutes

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