

Name _____

MULTIPLE CHOICE. Circle the one alternative that best completes the statement or answers the question. If the question requires work, please show it on this paper. (5 points each)

- 1) What is *differentiation* in planetary geology?
 - A) the process by which different types of minerals form a conglomerate rock
 - B) any process by which a planet's surface evolves differently from another planet's surface
 - C) any process by which one part of a planet's surface evolves differently from another part of the same planet's surface
 - D) any process by which a planet evolves differently from its moons
 - E) the process by which gravity separates materials according to density
- 2) Under what circumstances can differentiation occur in a planet?
 - A) The planet must have a rocky surface.
 - B) The planet must have a molten interior.
 - C) The planet must be made of both metal and rock.
 - D) The planet must be geologically active, that is, have volcanoes, planetquakes, and erosion from weather.
 - E) The planet must have an atmosphere.
- 3) What is the most important factor that determines the thickness, and therefore strength, of the lithosphere?
 - A) composition
 - B) internal temperature
 - C) distance of planet from Sun
 - D) viscosity
 - E) pressure
- 4) The three principal sources of the internal heat of terrestrial planets are
 - A) accretion, differentiation, and radioactivity.
 - B) conduction, convection, and eruption.
 - C) convection, differentiation, and eruption.
 - D) conduction, differentiation, and accretion.
 - E) accretion, differentiation, and eruption.
- 5) Which of the following worlds have the thinnest lithospheres?
 - A) Earth and Mars
 - B) Mercury and Venus
 - C) Venus and the Moon
 - D) Earth and the Moon
 - E) Earth and Venus
- 6) The densest planet in the solar system is
 - A) Saturn
 - B) Earth
 - C) Mercury
 - D) Venus
 - E) Jupiter

- 7) Earth is unique in the following ways *except*
- A) It is the only known place supporting life
 - B) It has oxygen in its atmosphere
 - C) It has the densest atmosphere among terrestrial planets
 - D) It's moon has the largest moon-size to planet-size ratio
 - E) It is the only Solar System planet with active plate tectonics
- 8) The coldest place you could step on inside of Saturn's orbit is
- A) South pole on Venus
 - B) Antarctica
 - C) North Pole on the Moon
 - D) At the summit of Valles Marineris on Mars
 - E) Night side of Mercury
- 9) The tallest known mountain and the deepest known gorge are on
- A) Mercury
 - B) Saturn
 - C) Jupiter
 - D) Venus
 - E) Mars
- 10) Why is Saturn almost as big as Jupiter, despite its smaller mass?
- A) Saturn is further from the Sun, thus cooler, and therefore less compact.
 - B) Saturn has a larger proportion of hydrogen and helium than Jupiter, and is therefore less dense.
 - C) Saturn's rings make the planet look bigger.
 - D) Jupiter's greater mass compresses it more, thus increasing its density.
 - E) Jupiter's strong magnetic field constrains its size.
- 11) Which of the following planets *cannot* be seen with the naked eye?
- A) Saturn
 - B) Venus
 - C) Neptune
 - D) Mars
 - E) Jupiter
- 12) Which of the following is the largest in size?
- A) Jupiter's magnetosphere
 - B) Jupiter's moon Ganymede
 - C) Jupiter
 - D) Olympus Mons
 - E) Saturn's moon Titan
- 13) The youngest surface in the Solar System is on
- A) Venus
 - B) Titan
 - C) Callisto
 - D) Io
 - E) Earth
- 14) Among Solar System planets, Jupiter has the strongest Coriolis Effect because
- A) It is the largest planet in the Solar System
 - B) It rotates fastest among planets
 - C) It has the most moons
 - D) Both A & B
 - E) None of the above
- 15) Which Solar System moon is most likely to have a sub-surface salt-water ocean?
- A) Triton
 - B) Callisto
 - C) Io
 - D) Europa
 - E) Titan

BONUS QUESTION

- 16) List at least five factors that you consider as important in fostering a life-sustaining environment on Earth. Briefly justify why you think each factor is significant.