

Name _____

Do not forget to write your name and fill in the bubbles with your student number, **leaving the last bubble blank**, and fill in test form A on the answer sheet. Write your name above as well. You have 55 minutes. For each question, mark the best answer. There are no formulas for this test.

- Miranda is a moon of
A) Mars B) Jupiter C) Saturn D) Uranus E) Neptune
- Which of the following is not considered a necessity for a planet to have a substantial magnetic field?
A) A layer inside that conducts electricity
B) A layer inside that is liquid
C) Rotation (of the planet)
D) A solid metal core
E) Actually, all of these are considered necessary for a magnetic field
- What chemical compound is believed to be the main cause of apparent global warming on Earth?
A) Carbon monoxide
B) Ozone
C) Carbon dioxide
D) Sulfuric acid
E) Chlorofluorocarbons
- The total number of known moons of the first four planets (closest to the Sun) is
A) 1 B) 2 C) 3 D) 4 E) 5 or more
- In the year 2075, a new Kuiper belt object is discovered by the spaceship Carlson, which observes that this new object is smooth, lacking craters at all. From this, we can conclude that this object
A) Has a very old surface
B) Has a very young surface
C) Must have at least one moon
D) Is made of more rock than ice
E) Is made of more ice than rock
- I am standing at a precipice looking down into a canyon far larger than Earth's Grand Canyon. Where am I?
A) Miranda B) Io C) Mercury D) Jupiter E) Mars
- What chemical compound can account for the red color of Mars?

- A) Sulfur
 - B) Iron Oxide (rust)
 - C) Ammonium Hydroxide
 - D) Ammonia
 - E) Methane
8. Which of the following objects is smallest?
A) Venus B) Mercury C) Mars D) Earth E) Ceres
9. Most asteroids can be found between the orbits of
A) Venus and Earth
B) Earth and Mars
C) Mars and Jupiter
D) Jupiter and Saturn
E) Saturn and Uranus
10. Short term comets come from _____ and long term comets come from _____.
A) The asteroid belt, the Kuiper belt
B) The asteroid belt, the Oort cloud
C) The Kuiper belt, the Oort cloud
D) The Oort cloud, the Kuiper belt
E) The Kuiper belt, the asteroid belt
11. In what way is Uranus different from Jupiter, Saturn, and Neptune?
A) It is the only one whose magnetic field is not centered on the planet
B) It is the only one whose magnetic field is not close to parallel to its rotation axis
C) It is the only one whose rotation axis is tilted way over compared to the orbital plane
D) It is the only one which has no clouds, storms, or other weather phenomena
E) It is the only one without rings
12. Which of the following moons is the largest?
A) Earth's Moon B) Ganymede C) Titan D) Triton E) Io
13. Where in the solar system have we seen "sand dunes", but those dunes are presumed to be made of ice crystals, not real sand?
A) Venus B) Triton C) Mars D) Titan E) Ganymede
14. Which of the following objects has a moon that is about half the size of itself?
A) Pluto B) Earth C) Jupiter D) Saturn E) Neptune
15. Why is it that the inner planets lost their early hydrogen atmospheres?
A) The Sun's gravity stripped it from them

- B) The early Sun made a giant wind that blew it away
 - C) The magnetic field of the Sun pulled it away
 - D) The inner part of the protoplanetary disk didn't have any hydrogen in it
 - E) Chemical reactions destroyed all of the early hydrogen in our atmosphere
16. What two factors allow Mercury to have cold areas, despite it being very close to the Sun?
- A) Slow rotation and little atmosphere
 - B) Slow rotation and high density
 - C) High density and little atmosphere
 - D) Slow rotation and high ice content
 - E) Little atmosphere and high ice content
17. The atmosphere of Neptune is composed primarily of
- A) Hydrogen B) Nitrogen C) Methane D) Oxygen E) Carbon dioxide
18. I am standing on an object. There are volcanoes spewing out sulfur compounds nearby. As I look up in the sky, I see I am near the planet
- A) Saturn B) Uranus C) Neptune D) Mars E) Jupiter
19. Europa is composed of
- A) All rock and metal
 - B) Mostly rock and metal with a thin layer of ice
 - C) About half ice and half rock and metal
 - D) Little rock and metal, mostly ice
 - E) All ice
20. How come a comet's coma and tail don't always exist?
- A) They are created by the Sun's magnetic field, which doesn't exist far away
 - B) They are destroyed by the Sun's magnetic field, so they vanish when they get too close
 - C) The Solar wind destroys them, so they don't exist close to the Sun
 - D) The heating from the Sun creates them, so they don't exist far away
 - E) They always exist, but when they are close to the Sun you can't see them
21. Which of the following planets has the thickest atmosphere?
- A) Venus B) Mars C) Neptune D) Mercury E) Earth
22. Compared to the Highland regions on the Moon, the Maria are
- A) Darker and appearance and older
 - B) Darker in appearance and younger

- C) Lighter in appearance and older
 - D) Lighter in appearance and younger
 - E) Made of Bleu cheese, instead of Green
23. Which planet has the largest storms in the solar system?
- A) Jupiter
 - B) Mars
 - C) Saturn
 - D) Neptune
 - E) Earth
24. It is believed that molecular clouds become protoplanetary disks. Molecular clouds tend to have very little rotation, but protoplanetary disks rotate (relatively) quickly. What causes this increase in rotation?
- A) The star's wind pushes the cloud and starts it rotating
 - B) Magnetic fields from the rotating star push the planetary nebula around
 - C) Ejections of excess gas and dust causes the disk to "spin up"
 - D) Gravitational influence of the Star pulls the disk rapidly around
 - E) It is just an effect of shrinking – when something gets smaller, its rotation increases
25. Which of the following types of meteorites gives us the best picture of what the early solar system was made of?
- A) Achondrites
 - B) Iron meteorites
 - C) Stony-Iron meteorites
 - D) Carbonaceous chondrites
 - E) Icy meteorites
26. When you see a very narrow ring around a planet, what is the likely cause of this narrowness?
- A) The ring was only recently formed, and hasn't had time to spread out
 - B) The planet has a strong magnetic field, which keeps the ring narrow
 - C) The ring must have high levels of metals, which are strong and keep it together
 - D) Winds from the Sun and from the planet must combine to keep the ring together
 - E) A pair of small shepherd moons on either side must gravitationally keep it in place
27. Titan and _____ are the only moons with significant atmospheres
- A) Moon
 - B) Europa
 - C) Ganymede
 - D) Triton
 - E) Charon
28. Which of the following is a member of the Kuiper belt?
- A) Eris
 - B) Triton
 - C) Ceres
 - D) Iapetus
 - E) Callisto

For each of the following, please look at the pictures on the screen to identify the object.

29. What is this a picture of?

- A) Earth B) Neptune C) Miranda D) Uranus E) Io

30. What is this a picture of?

- A) Ganymede B) Venus C) Mars D) Titan E) Europa

31. What is this a picture of?

- A) Neptune B) Venus C) Earth D) Triton E) Saturn

32. What is this a picture of?

- A) Iapetus B) Moon C) Triton D) Miranda E) Mercury

33. What is this a picture of?

- A) Io B) Mercury C) Jupiter D) Venus E) Moon