

1. According to Newton, planets orbit in eclipses with what at the two foci?	the center of mass (of the planet and the Sun) and nothing	
2. _____ are the younger, darker, smooth surface features on the Moon	Maria	
3. Assuming they are all operating at the same wavelengths, which telescope is the largest?	The telescope with the smallest angular resolution	
4. Astronomers refer to blurring of light due to the atmosphere as...?	Seeing	
5. Astronomers use parallax to measure what?	Distance	
6. Astronomy is the study of what?	the universe and everything in it	
7. An atom of an element with a different number of neutrons than number of protons is an _____	Isotope	
8. At what point is a planet travelling the fastest in its orbit?	Perihelion	
9. The average distance between the Earth and the Sun defines what unit of length?	The Astronomical Unit (AU)	
10. The Balmer Series line, Hydrogen Alpha, will be seen as an emission line when the electron in the hydrogen atom transitions between which orbitals	2nd excited state to 1st excited state	
11. These bands within the Earth's magnetosphere trap the incoming charged particles of the solar wind, and ultimately move them along the magnetic field lines toward the Poles	Van Allen Radiation Belts	
12. The blackbody spectrum of planet Zebes has a peak wavelength at 4 um. Planet Charybdis is one third as hot as Zebes. What is the peak wavelength for Charybdis?	12 um	
13. The broadening of spectral lines can be caused by...?	Density of the gas, magnetic fields, rotation of a star, thermal motion of the atoms that make up the gas	
14. Consider a beam of green light and a beam of red light. The speed of the green light compared to that of the red light is?	Same speed - The speed of light	
15. Consider a binary star system, where the star masses are Mass 1 and Mass 2. A distance R separates the two stars. If we were magically increase the distance between the two stars to be FIVE times more distant, how would the force of gravity change between the two stars?	Weaker by a factor of 25	
16. The constellations of the zodiac fall along?	The Ecliptic	
17. The coordinate _____ on the celestial sphere is analogous to the coordinate latitude on the Earth?	Declination	
18. The coordinate _____ on the celestial sphere is analogous to the to the coordinate longitude on the Earth	Right ascension	
19. The core of the Moon is (larger/expected/smaller/no core)	smaller than expected	
20. Crater counting is a method to determine what characteristic of a planetary surface?	Relative Age	
21. The crust of the Earth and the solid upper part of the mantle make up the _____	Lithosphere	
22. Define angular resolution	Its ability to distinguish two adjacent objects close together in the sky	
23. The disk-shaped collection of gas and dust that the Solar System formed out of is called what?	The Solar Nebula	
24. The energy of an X-ray photon compared to an infrared photon is?	Higher	
25. For a solar eclipse to occur, the moon must be in what phase?	New Moon	
26. Greenhouse gases warm the planet because they...?	Absorb the outgoing infrared radiation leaving the warmed surface of the planet and re-radiate it in all directions	
27. How does the Nebular Theory of how our Solar System formed explain why the orbits of the planets all lay in the same plane?	The early solar nebula flattened into a disk	

28. How do the densities of the gas giants and terrestrial planets compare?	All terrestrials are denser than any of the gas giants
29. If the Earth were to revolve around the Sun in 500 days instead of 365.24 days, but keep the same rotational speed, the Solar Day would be?	Longer*****
30. If the Earth were to revolve around the Sun to 250 days instead of 365.24, but keep the same rotational speed, the Solar Day would?	Longer
31. If the Moon is in its Full Moon phase, then Earth is experiencing which type of tides?	Spring Tides
32. If we were to place seismometers on Mars that were evenly distributed over the entire surface, and all locations detect both P- and S-waves, what can we conclude?	Mars has a completely solid interior
33. If we were to scale the solar system to fit in a football field with the Sun at one end zone and Pluto at the other, how large would the Earth be?	Size of a grain of salt
34. If you wanted to study the hot gas in the universe, what part of the electromagnetic spectrum would be the most appropriate to conduct the study with?	X-ray
35. The imaginary desert planet Arrakis is very hot. In fact, it is TWO TIMES HOTTER than Earth. Earth's blackbody curve has a peak wavelength of 10 um. At what wavelength does the blackbody spectrum of Arrakis peak at?	2.5 um
36. An imaginary object that absorbs 100% of all wavelengths of light and then perfectly re-radiates that energy (as thermal radiation) perfectly according to temperature is called what?	A Kelvin Body
37. The imaginary planet Fawkes is identical in size to the Earth, but is much closer to its star. As a result, Fawkes is THREE TIMES HOTTER than the Earth? How much more energy is Fawkes emitting to space than Earth is?	81 times
38. In night sky viewing, it is useful to imagine all the planets and stars as if they are suspended on the inside of a giant sphere called what?	The Celestial Sphere

39. In the Bohr model of the atom, electrons...?	Only make transitions between orbitals of specific energies
40. The _____ is the hypothetical dividing line in the Solar Nebula interior to which the temperature is too high to form water ice grains and exterior to which it is cool enough to form water ice grains	ice-line
41. The _____ is the process by which planets generate magnetic fields	dynamo effect
42. Jupiter (Atmosphere? Mag. Field? Moon? Rings?)	Hydrogen, Yes, Yes, Yes
43. Jupiter's equatorial and low latitudes rotate faster than the higher latitudes and polar regions, this is called...	Differential Rotation
44. Kepler's 3rd Law states that a planet's _____ squared equals its _____ cubed	period, semimajor axis
45. The Kuiper Belt is found where in the Solar System?	Beyond the orbit of Neptune
46. Mars (Atmosphere? Mag. Field? Moon? Rings?)	Carbon Dioxide, No, Yes, No
47. Mercury (Atmosphere? Mag. Field? Moon? Rings?)	No, Yes, No, No
48. A micrometer is how many meters?	1/1,000,000th of a meter
49. The Moon (Atmosphere? Mag. Field? Moon? Rings?)	No, No, N/A, No
50. A moon has a 5:2 spin-orbit resonance, this means...?	It orbits its planet 2 times for every 5 moon rotations
51. The number of wave crests passing a fixed point per second is defined as?	Frequency
52. The _____ of an ellipse describes how "out of circular" the ellipse is.	Eccentricity
53. One 360 degree rotation of the Earth defines the _____, which is the time required for a star to return to the same position in the sky from one night to the next	Sidereal Day

54. The Orion Nebula, M-42. is a hot, thin cloud of glowing gas, so it's spectrum is observed as a...?	Absorption Spectrum
55. The peak-to-peak distance of a wave defines its?	Wavelength
56. The point in a planet's orbit that is furthest from the Sun is called?	Aphelion
57. A precise measurement of the size the cores of the gas giant planets would allow planetary scientists to discriminate between which two theories regarding gas giant planet formation?	Core-Accretion vs Gravitational Instability
58. The process by which a planet will layer itself by density, such that the denser materials will settle to the center of a planet while the less dense materials will rise towards the surface, is called?	Planetary Differentiation
59. The process by which dust grains collect together and grow larger, eventually becoming planetesimals and then larger protoplanets and planets is...?	Accretion
60. The process by which the tides slowed the Moon's rotational period to match its orbital period is called _____. In this case, we say the Moon has a _____	tidal-locking, synchronous orbit
61. Saturn (Atmosphere? Mag. Field? Moon? Rings?)	Hydrogen, Yes, Yes, Yes
62. Saturn Rings	C B Cassini Division A Encke Gap
63. The science of how light interacts with matter is _____	Spectroscopy
64. The seasonal Martian ice caps are made of what?	Carbon Dioxide Ice
65. The shape of a blackbody curve depends on what single property of the blackbody?	Temperature
66. The speed of an X-ray photon compared to an infrared photon is?	Same speed - The speed of light
67. Starting with Visible Light, what is the correct order from shortest to longest wavelengths?	Visible Infrared Microwave Rado
68. Starting with Visible Light, what is the correct sequence of the Electromagnetic Spectrum is in the correct from the longest to shortest?	Visible Ultraviolet X-ray Gamma Ray

69. A successful theory of the formation of the solar system must explain:	All observed properties of the solar system
70. This moon has a very young surface made of water ice and is likely to have liquid water ocean 100 or more km beneath the water-ice crust	Europa
71. This scientist is famous for coining the term radioactivity and performing the pioneering research in that field	Marie Curie
72. The tidal force is an example of a _____ force	differential
73. The upper part of the mantle that can flow, and therefore has convection occurring in it is called the _____	Aesthenosphere
74. Uranus is the _____ planet from the Sun	7th
75. Venus (Atmosphere? Mag. Field? Moon? Rings?)	Carbon Dioxide, No, No, No
76. Visible light, infrared light, and X-rays are all examples of regions of the _____	Electromagnetic Spectrum
77. We expect that all the early terrestrial planets had an early atmosphere that was generated by volcanic outgassing during and shortly after differentiation. What do we call this atmosphere?	The Secondary Atmosphere
78. What are the two major surface features on the Moon?	Maria and Cratered Highlands
79. What characteristic of Earth gives rise to the seasons?	Earth's axial tilt
80. What describes Mercury's spin-orbit resonance?	Three ROTATIONS per two ORBITS
81. What is an inherent problem for radio telescopes?	Radio waves have long wavelengths, so radio telescopes have poor resolution
82. What is a reason that reflecting telescopes are preferred to refracting telescopes?	Mirrors can be supported from the bottom and thus be made larger than lenses

83. What is evidence that the gas giant planets migrated, and thus cleared out the remaining planetesimals and protoplanets, during the early planetary formation stages of the solar system?	The craters on the Moon and Mercury indicating a time of Late Heavy Bombardment
84. What is Kepler's 3rd Law?	$P^2 = a^3$
85. What is NOT a weather phenomenon on Mars?	Rain
86. What is required to have a magnetic field?	Fast rotational period (<25 hours)
87. What is required to have an atmosphere?	Real temperature is higher than the expected temperature
88. What is the 6th planet from the Sun?	Saturn
89. What is the composition of Earth's atmosphere?	78% Nitrogen, 21% Oxygen, 1% other
90. What is the correct description for the number of tides experienced on Earth per day?	Two high tides, two low tides
91. What is the correct way to write 67,300,000 in scientific notation?	6.73×10^7
92. What is the largest mountain in the solar system and what planet is it located on?	Olympus Mons - Mars
93. What is the maximum angular distance away from the Sun that VENUS can appear in the sky?	47 degrees
94. What is the method of using computers to synthesize and combine the data from multiple telescopes in order to increase the angular resolution called?	Interferometry
95. What is the name astronomers give to the technology on telescopes that corrects for atmospheric blurring in real-time?	Adaptive Optics
96. What is the name of a Martian day?	Sol
97. What is the name of the process that makes the Earth 37 Kelvin warmer than expected?	Greenhouse Effect
98. What is the theory that describes the collapse of the original nebula into a rotating disk of gas and dust out of which of the planets formed?	Nebular Theory

99. What is the theory that explains how an initial temperature gradient in the Solar Nebula gave rise to the observed compositional and density gradient?	Condensation Theory
100. What is thought to be the primary contributor to the heat that was needed to melt the early planets?	Radioactivity of short half-life radioactive isotopes
101. What layer of Earth's atmosphere contains the ozone layer?	Stratosphere
102. What layer of Earth's atmosphere does convection occur in?	Troposphere
103. What natural phenomenon on Earth provides information on the density structure of Earth's interior?	Earthquakes
104. What planet has a sidereal day longer than its year and has a retrograde rotation?	Venus
105. What type of apparent motion is a planet experiencing if it appears more eastward night-to-night relative to the background?	Prograde motion
106. What type of apparent motion is a planet experiencing if it appears more westward night-to-night relative to the background stars?	Retrograde motion
107. When there is a straight-line alignment between a superior planet, the Earth, and the Sun, such that the planet and Sun are on opposite sides of the Earth we say that the planet is at _____? [Planet-Earth-Sun]	Opposition
108. Which layer of Earth and its atmosphere is convection not occurring in?	Mesosphere
109. Which of Newton's Laws tells us that for every force, there is an equal and opposite force?	Newton's Third Law
110. Which of the following is an observation Galileo made that helped to overturn Geocentrism?	Full cycle of phases of Venus
111. Which of the following is NOT a quality of a good scientific theory?	100% certainty
112. Which of the following is the correct expression of Newton's Second Law of Motion?	The acceleration of an object is related to the force and the mass of the object ($F=ma$)

113. Why are molecular lines more complex than atomic (elemental) spectral lines?	Molecules can have electron transitions and can also vibrate and rotate
114. Why don't we experience lunar and solar eclipses every lunar cycle?	The Moon's orbit is inclined by 5 degrees with respect to the Earth-Sun plane
115. Why is the sky blue?	The atmosphere more efficiently scatters the shorter (bluer) light
116. You measure the spectrum of an emission nebula and find that the hydrogen alpha line is redshifted. What can you conclude?	The nebula is moving away from Earth