

Edmonds Community College
ASTRONOMY 100
Winter Quarter 2007
Sample Exam # 4

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1. The sun's atmosphere consists of the following "layers" in order, from the "surface" outward
 - a. corona, chromosphere, photosphere
 - b. core, corona, photosphere
 - c. photosphere, corona, chromosphere
 - d. photosphere, core, corona
 - e. photosphere, chromosphere, corona

2. Which of the sun's atmospheric "layers" is the widest in distance, and the hottest in temperature
 - a. corona
 - b. chromosphere
 - c. radiative zone
 - d. convective zone
 - e. photosphere

3. Visibly, the sun's corona can only be seen during a solar eclipse
 - a. true
 - b. false

4. The nuclear fusion at the core of the sun involves ___ helium nuclei fusing to form ___ hydrogen nucleus
 - a. 4/4
 - b. 1/4
 - c. 4/8
 - d. 4/1
 - e. none of the above

5. What is the difference between carbon burning, such as burning wood in a fireplace, and hydrogen "burning" or fusion in the core of the sun (and other stars)
 - a. carbon burning involves the fusing of carbon nuclei to form a new element
 - b. hydrogen burning involves the fusing of protons to form a new element
 - c. carbon burning is reaction that involves the electrons of atoms
 - d. hydrogen burning is a reaction that involves the nuclei of atoms
 - e. all but (a) of the above

6. What is the name of the "layer" of the sun where we can see the tops of convection cells (also called granulation)
 - a. corona
 - b. chromosphere
 - c. core
 - d. photosphere
 - e. radiative zone

7. With respect to question # 6 above, in which zone of the sun is granulation actually occurring
 - a. core
 - b. radiative zone
 - c. photosphere
 - d. chromosphere
 - e. convective zone

8. Which of the following types of heat transfer is a good analogy for the sun's convection

- b. heat radiating from an electric burner
 - b. heat radiating from a wood fire
 - c. rising cells of hot water that cool at the surface and sink again
 - d. conduction of heat from a hot solid surface to a cold solid surface
 - e. conduction of heat from a hot solid surface to a cool liquid
9. In the sun's granulation, what do the different colors or brightness of gases indicate about the relative temperatures
- a. cool, sinking gas is brighter in color
 - b. cool, sinking gas is darker in color
 - c. hot, rising gas is darker in color
 - d. hot, rising gas more orange in color
 - e. cool, sinking gas is more yellow in color
10. In the radiative zone of the sun, photons of energy speed out to the sun's surface in a matter of seconds
- a. true
 - b. false
11. Prominences, phages, filaments, sunspots, and flares occur in greater numbers and with greater frequency when the sun is in an "active" phase of its sunspot cycle
- a. true
 - b. false
12. With respect to question # 11 above, the sunspot cycle occurs because of changes in the sun's magnetic field
- a. true
 - b. false
13. About how many Earth's can fit across the diameter of the sun
- a. 10
 - b. 50
 - c. 70
 - d. 100
 - e. 200
14. Without the sun's energy, there would still be an abundance of life on Earth
- a. true
 - b. false
15. The temperature of the sun's corona is unusual in which way
- a. it is much cooler than the temperature of the photosphere, or surface
 - b. it is much cooler than the temperature of the core
 - c. it is similar in temperature to the core
 - d. it is much hotter than the temperature of the photosphere
 - e. c and d above
16. What is the approximate average temperature of the sun's "surface", in Kelvin degrees
- a. 1000 K
 - b. 2000 K
 - c. 3000 K
 - d. 4000 K
 - e. 6000 K
17. Why are sunspots darker in color than the surrounding photosphere
- a. they are hotter in temperature

- b. they are areas of rising gas
 - c. they are cooler in temperature
 - d. they are areas of high magnetic intensity
 - e. both c and d above
18. Most comet nuclei are believed to be
- a. chunks of rock chipped from asteroids
 - d. chunks of ice from Jupiter's icy satellites
 - b. chunks of wood set on fire by the Sun
 - e. chunks of rock from inner, rocky planets
 - c. chunks of dusty ice left over from the early solar system
19. A comet's ion tail always points in which direction
- a. away from the sun
 - d. toward the sun
 - b. in a direction along its orbital path
 - e. toward the Earth
 - c. toward Jupiter
20. What and where is the Oort Cloud, a possible source of some comets
- a. it is a cloud of gas orbiting Pluto
 - b. it is a sphere of solar system debris about 50,000 AU's from the sun
 - c. it is a zone of cometary debris just outside Pluto's orbit
 - d. it contains some of the earliest fragments of the young solar system
 - e. both b and d above
21. If a piece of solar system debris is found drifting through space it is called a
- a. meteor
 - d. any of the above
 - b. meteorite
 - e. none of the above
 - c. meteoroid
22. The streak of light we see as a piece of solar system debris falls through Earth's atmosphere, burning up as it goes, and streaking across the sky, is a
- a. falling star
 - d. any of the above
 - b. meteorite
 - e. none of the above
 - c. meteoroid
23. A piece of solar system debris that survives its blazing passage through the atmosphere and lands on the Earth's surface, is called a
- a. meteor
 - d. meteorite
 - b. fallen star
 - e. comet
 - c. meteoroid
24. A meteor shower results from
- a. a small piece of rock passing through Earth's atmosphere
 - b. a meteor passing through a rain cloud on Earth

- c. the Earth passing through solar system debris strewn along a comet's orbit
 - d. material re-entering Earth's atmosphere after being ejected from a volcanic eruption
 - e. falling meteorologists
25. The heating which produces volcanic activity on Io, is probably caused by
- a. original heat of formation
 - b. tidal stress from Jupiter & other massive moons
 - c. decay of radioactive elements in its interior
 - d. nuclear fusion within its interior
 - e. nuclear fission within its interior
26. The rotation periods of Jupiter and Saturn are
- a. about the same as Earth's rotation period
 - b. several weeks in length
 - c. several days in length
 - d. about 1 hour in length
 - e. about 10 hours in length
27. Jupiter has a magnetic field which is
- a. much stronger and larger than Earth's
 - b. weaker and smaller than Earth's
 - c. as strong and as large as Earth's
 - d. made larger by the Io torus (Io's volcanic debris thrown into orbit around Jupiter)
 - e. a and d above
28. The surface of Europa appears to be covered with
- a. dark areas of older crust, separated by lighter grooved terrain
 - b. a smooth layer of ice, criss-crossed by many cracks
 - c. many ancient craters and maria
 - d. rugged mountain ranges and ancient volcanoes
 - e. terrain which looks as though it was reassembled after a shattering impact
29. Saturn's rings consist of
- a. hot, ionized gas from Saturn's magnetosphere
 - b. a thin but extensive gas cloud over the equator
 - c. many hundreds of separate rings of ice and rock particles
 - d. a thick, solid ring, made of rock
 - e. a thin, solid ring, made of ice
30. The element in greatest abundance on Jupiter and Saturn is
- a. carbon
 - b. nitrogen
 - c. hydrogen
 - d. oxygen
 - e. sulfur
31. Which planet has the Great Dark Spot, a rotating storm system like Jupiter's Great Red Spot
- a. Saturn
 - b. Neptune
 - c. Uranus
 - d. a and c above
 - e. b and c above

32. The gas planet whose axis of rotation lies almost parallel to its orbital plane is
- Earth
 - Mars
 - Jupiter
 - Neptune
 - Uranus
33. The ring system around Uranus was originally discovered by what observing technique
- occultation of starlight as seen from Earth telescopes
 - infrared observations from *Pioneer*
 - radar reflection from the rings
 - radio transmissions from the rings
 - observation by the cameras on *Voyager 1*
34. Which 2 planets were discovered by predicting their positions using Newton's theory of gravity to explain perturbations in the orbit of Uranus
- Mercury & Venus
 - Saturn & Jupiter
 - Neptune & Pluto
 - Jupiter & Mars
 - Venus & Earth
35. Which of the following is Pluto's only moon
- Titan
 - Charon
 - Moon
 - Callisto
 - Ganymede
36. Pluto's orbit has a _____ eccentricity, and a _____ tilt with respect to the ecliptic
- high, low
 - low, high
 - high, high
 - low, low
37. Why do we see Uranus's ring system "face on", as opposed to "edge on"
- the rings are in the planet's equatorial plane
 - the planet is tilted about 90 degrees with respect to the ecliptic (and our line of sight)
 - Uranus's north and south poles point toward us (and the sun) as it orbits the sun
 - the rings of all the planets are in their equatorial planes
 - all of the above
38. Which of the following facts and possibilities intrigues researchers in Astrobiology, the interdisciplinary science of life in the universe
- Europa's broken ice surface
 - liquid water underneath Europa's ice surface
 - a source of heat beneath the water that keeps it liquid
 - abundant life exists at the bottom of Earth's oceans, in the mid-ocean vent systems
 - all of the above
39. Which of the following features is NOT common to all of the four gas giant planets
- large rotating storm systems
 - ring systems
 - many moons

- d. small rocky cores
 - e. thick gaseous atmospheres
40. The solar system's main asteroid belt is located between which two planets
- a. Pluto and Neptune
 - b. Neptune and Uranus
 - c. Uranus and Saturn
 - d. Saturn and Jupiter
 - e. Jupiter and Mars
41. Asteroids in the main asteroid belt (question # 40 above) are highly likely to collide with Earth
- a. true
 - b. false
42. The small dust and ice center of a comet is called the
- a. nucleus
 - b. coma
 - c. halo
 - d. halo
 - e. all of the above
43. Kuiper Belt objects are found outside which planet's orbit (most of the time)
- a. Mars
 - b. Jupiter
 - c. Saturn
 - d. Neptune
 - e. Pluto
44. The period of the orbit of Halley's comet is about _____ years
- a. 51
 - b. 76
 - c. 95
 - d. 110
 - e. 1459
45. What is the approximate age of the Sun
- a. 5 million years
 - b. 5000 years
 - c. 5 billion years
 - d. 50 billion years
 - e. 500 million years
46. Another term for the hydrogen fusion taking place in the sun's core is
- a. electron-proton chain
 - b. proton-neutron chain
 - c. electron-neutron chain
 - d. photon-photon chain
 - e. proton-proton chain
47. A solar prominence is the same thing as a solar flare, just seen from a different angle
- a. true
 - b. false
48. When we speak of the sun's "surface" we are speaking of something solid
- a. true
 - b. false
49. Spicules are found in which layer of the sun's total structure
- a. corona
 - b. photosphere
 - c. chromosphere
 - d. radiative zone
 - e. convective zone

50. What is meant by “differential rotation”, exhibited by the sun and gas giant planets
- a. poles rotate faster than equator
 - b. equator rotates fast than poles