Astr 3010 History of Astronomy
Exam 3 Samples

Chapter 8
Multiple Choice Questions

1. The first regular astronomical journal to be published was
   a) The Nautical Almanac and Astronomical Ephemeris
   b) The Monatliche Correspondenz.
   c) The Philosophical Transactions.
   d) Astronomische Nachrichten

2. The International Astronomical Union was formed in
   a) 1904.
   b) 1899.
   c) 1919.
   d) 1953.

3. The earliest high quality spectra of the sun were taken by
   a) Isaac Newton.
   b) Joseph Fraunhofer.
   c) Gustav Kirchhoff.
   d) Julius Plucker.

4. The person most responsible for the development of the rules of spectroscopic identification is
   a) Isaac Newton.
   b) Joseph Fraunhofer.
   c) Gustav Kirchhoff.
   d) Julius Plucker.

5. The wavelength scale for spectral lines was made accurate and reproducible by
   a) Joseph Fraunhofer.
   b) Jean Foucault.
   c) Anders Angstrom.
   d) Auguste Comte.

6. While systematically searching for the planet Vulcan, Heinrich Schwabe discovered
   a) the rotational period of the sun.
   b) the sunspot cycle.
   c) the magnetic fields associated with sunspots.
   d) the chemical make-up of the sun.

7. The person most responsible for the establishment of magnetic observatories around the world was
   a) Heinrich Schwabe.
   b) Anders Angstrom.
   c) Alexander von Humboldt.
   d) C. F. Gauss.

8. The first individuals to observe a solar flare were
   a) Heinrich Schwabe and Alexander von Humboldt.
   b) C. F. Gauss and John Lamont.
   c) R. C. Carrington and Richard Hodgson.
   d) George E. Hale and Percival Lowell.

9. To observe features in the atmosphere of the sun, 19th century astronomers
   a) build temporary observatories along the track of eclipses to make observations during total eclipses.
   b) built eclipse generators for their telescopes that would produce an artificial eclipse.
   c) built large permanent observatories all over the world in hopes that an eclipse would pass over one of them.

10. The development of a high dispersive spectrograph to study the solar corona and chromosphere is jointly credited to
   a) P. J. Janssen and J. Norman Lockyer.
   b) Gustav Kirchhoff and Robert Bunsen.
   c) C. A. Young and Richard Hodgson.
   d) Bengt Edlen and Anders Angstrom.

11. The most widely held theory for the source of the sun's energy in the mid to late 19th century was known as
   a) nuclear fusion.
   b) Kelvin-Helmholtz contraction.
   c) combustion of hydrocarbons.

12. By the end of the 19th century the best refracting telescopes in the world were being made by
   a) Joseph Fraunhofer.
   b) William Herschel
   c) Alvan Clark and Sons.
   d) Justus von Liebig.

13. The first serious scientific studies of comets were done by
   a) Charles Messier.
   b) Giovan Donati.
   c) H. W. Olbers
   d) William Herschel

14. Using orbital calculations, John Couch Adams determined the source of most meteor showers were
   a) asteroids in the asteroid belt.
   b) periodic comets.
   c) occasional impacts between asteroids and the Moon.
   d) solar storms.

15. The discovery of the moons of Mars is credited to
   a) William Herschel
   b) Asaph Hall
   c) Giovanni Schiaparelli
   d) Percival Lowell

16. The Lowell Observatory near Flagstaff, Arizona was built primarily to
   a) observe Mars.
   b) observe the moons of Jupiter.
   c) observe the rings of Saturn.
   d) observe the sun.

17. The correct theory for the character of the rings of Saturn was proposed by
   a) Percival Lowell.
   b) George Bond
   c) Giovanni Cassini
   d) James Clerk Maxwell

18. The person responsible for the discovery of Pluto was
   a) John Couch Adams.
   b) Clyde Tombaugh.
   c) Giovanni Schiaparelli
   d) William Herschel.

19. The nebular theory for the formation of the solar system was first proposed by
   a) Pierre-Simon Laplace.
   b) James Clerk Maxwell.
   c) William Herschel.
   d) Percival Lowell.

20. The solar system formation theory proposed by Thomas Chamberlin was
   a) cometary impacts with the sun throwing off large amounts of material which coalesced into the planets
   b) a passing star tidally pulling material off the sun which coalesced into the planets.
   c) a collapsing cloud of gas and dust flattening into a disk with a central bulge out of which both the sun and planets form.
   d) a divine creation out of nothingness.

21. The first stellar classification scheme was developed by
    a) Henry Draper.
    b) Angelo Secchi.
    c) William Huggins.
    d) David Gill.

22. William Huggins proved that true nebulosity exists by taking spectra of
    a) the Orion nebula
    b) the Cat's Eye nebula.
    c) the Andromeda nebula.
    d) the nebulosity around the Pleiades.

23. The observatory responsible for the classification of hundreds of thousands of stars in the Henry Draper catalogue was the
    a) Lowell Observatory.
    b) Mount Wilson Observatory.
    c) Harvard College Observatory.
    d) Yerkes Observatory.

24. The individual who classified more stars than any other person in history was
    a) Cecilia Payne.
    b) Annie Jump Cannon.
    c) Henrietta Leavitt.
    d) Williamina Fleming.

25. The Hertzsprung-Russell diagram is a graph of
    a) luminosity versus mass.
    b) luminosity versus temperature.
    c) mass versus temperature.
    d) temperature versus spectral class.

26. The person most responsible for determining the abundance of hydrogen is stars was
    a) Annie Jump Cannon.
    b) Cecilia Payne.
    c) Henry Norris Russell.
    d) Arthur Eddington

27. The person who finally proposed the correct method of how the sun gets its energy was
    a) Albert Einstein.
    b) Cecilia Payne.
    c) Hans Bethe.
    d) Henry Norris Russell.

28. Subramanian Chandrasekhar determined
    a) that white dwarf stars are degenerate matter.
    b) the maximum mass of a white dwarf star.
    c) the minimum mass of a white dwarf star.
    d) the chemical composition of white dwarf stars.

Essay Questions

1. Describe the expansion in astronomical publications beginning in the mid 1600's. What are some of the early journals and where were they being published?
2. Describe the development of solar spectroscopy. Who were the individuals pioneering the science of spectroscopy? Include a discussion on the development of the instruments of spectroscopy.
3. Discuss some of the advances in solar astronomy that took place in the second half of the 19th century. Who were some of the individuals involved and what types of measurements were they making?
4. Discuss the advances in telescope making that took place in the 19th century. What types of telescopes were being made and who was making them? What advances in chemistry allowed for the construction of better reflecting telescopes?
5. Discuss the developments in the study of comets and meteors in the 19th century. Who was conducting the studies and what were some of their theories?
6. Discuss the discoveries of the moons and bodies in the solar system in the late 1800's and early 1900's. Who was making the observations and proposing the theories and what were some of the theories and discoveries?
7. Describe some of the theories for the formation of the solar system that were popular in the 1800's. Who proposed the theories and what were some of the problems of the theories.
8. Discuss the development of the stellar classification scheme. What were the earliest classifications based on? What was the final classification scheme and who was most responsible for it? Where and under what conditions were most of the stellar classifications being done?
9. Describe some of the "unusual" stars that were observed and theorized about in the 1800's and first half of the 1900's. Who was doing the theorizing and what were their theories?

Chapter 9

Multiple Choice Questions

1. The Association of Universities for Research in Astronomy (AURA) was formed in the 1950's to
    a. operate the Kitt Peak National Observatory, the Cerro Tololo Observatory in Chile and a solar observatory at Sacramento New Mexico.
    b. operate the Mauna Kea observatory in Hawaii, the Cerro Pachon observatory in Chile and the McMasters Solar Observatory at Kitt Peak Arizona.
    c. take over the operation of the Mount Wilson and the Mount Palomar Observatories in California from the University of California system.
    d. build new observatories on Mauna Kea, Kitt Peak and Mount Wilson.

2. The South American country where more astronomical observatories have been built than any other country is
    a. Brazil.
    b. Argentina.
    c. Peru.
    d. Chile.

3. The Australian built their first observatory in the
    a. 1910's.
    b. 1990's.
    c. 1940's.
    d. 1880's.

4. With the quality of instruments available today, an amateur can do better quality astrophotography, photometry and/or spectroscopy with a small telescope than
    a. Hubble was able to do with the 200" telescope on Mount Wilson.
    b. the Hubble Space Telescope was able to do after the first repair mission.
    c. the Keck telescopes could do when they were first built.
    d. the best telescopes on Kitt Peak could do a decade ago.

5. The next generation of telescopes will be made
    a. as single large mirrors over 20 meters in diameter.
    b. by spinning large tanks of liquid metals to produce reflectors over 30 meters in diameter.
    c. by combining several large (8.2-m) mirrors into a single telescope or a large number of 1-m segments into a single large telescope.
    d. combining several large telescopes separated by hundreds of meters into an optical interferometer.

6. The telescope that will be the replacement for the Hubble Space Telescope is the
    a. James Webb telescope.
    b. Spitzer Space Telescope.
    c. William Herschel telescope.
7. The first radio telescopes were built in the
    a. 1910's.
    b. 1930's.
    c. 1950's
    d. 1940's.

8. Because of their longer wavelengths, radio telescopes are
    a. able to penetrate through the gas and dust in the galaxy and see the center of the Milky Way.
    b. able to get better resolution for the same size "mirror" as optical telescopes.
    c. able to observe during night or day.
    d. able to track objects across the sky better than optical telescopes.

9. The discovery of the Cosmic Microwave Background was by
    a. Robert Dicke at Princeton University after he had predicted it would exist and built a receiver to detect it.
    b. Arno Penzais and Robert Wilson by accident while they were trying to calibrate a radio horn they had built for satellite communications.
    c. Karl Jansky using a radio dish he built in England in the 1950's.
    d. Grote Reber in the 1930's using a radio dish he built in his back yard.

10. The first telescopes to be placed in space were launched in
    a. the 1940's.
    b. the 1990's.
    c. the 1970's.
    d. the 1980's.

11. The area of astronomy which saw the greatest revival due to the "space-age" is
    a. variable star astronomy.
    b. galactic astronomy.
    c. planetary astronomy.
    d. stellar astronomy.

12. Quasars were discovered by
    a. optical astronomers in the 1960's.
    b. radio astronomers in the 1960's.
    c. infrared astronomers in the 1980's.
    d. gamma ray astronomers in the 1980's.

13. The first person to measure the spectra of a quasar and determine its redshift was
    a. Karl Jansky.
    b. Maarten Schmidt.
    c. Jocelyn Bell.
    d. Joseph Taylor.
14. Study of a binary pulsar system is important because
    a. they are an extreme laboratory for the testing of general relativity.
    b. they present an imminent danger to the survival of life on Earth.
    c. they are extremely radio loud and interfere with radio based communications.
    d. they produce gravity waves which have been detected by instruments here on Earth.

15. The most extreme and violent environment in the universe today is
    a. in the accretion disk near the event horizon of a supermassive black hole
    b. between two neutron stars in a binary pulsar system.
    c. near the surface of a white dwarf star in a binary system that is about to produce a nova outburst.
    d. at the center of a massive star forming region like the Orion Nebula.

Essay Questions

1. Discuss the development of large observatories like Kitt Peak, Mauna Kea and Cerro Tololo. What organizations are involved in the development of these observatories? What types of and sizes of telescopes have been built at these observatories. What are the important considerations for the choice of the site of the observatories?
2. Discuss the advances in photographic techniques since the 1910's to today. What types of detectors have been used and what were/are their sensitivities. Other than the camera and telescope, what other equipment is needed and how has that advanced over the years?
3. Describe at least two examples of the Next Generation Telescope. What types of telescopes are they and how will they be constructed? What are the advantages of the telescopes?
4. Describe the development of radio astronomy from its earliest days in the 1930's to the present day. Who were some of the people involved in the development? What are some of the most prominent and/or largest radio telescopes and where are they located? What are some of the important discoveries which have happened because of radio astronomy?
5. Describe two space based observatories. When were they launched? What wavelengths do/did they observe in? What are some of the discoveries which have been made with them?
6. Describe two planetary exploration missions. Where did they go? When were they launched? What are some of the important results of the missions?
7. Describe two of the "extreme objects" that have been discovered in the last 50 years. What are they? What makes them so violent? Where are they located (distance from Earth)? Do they pose a threat to Earth?