

PHYSICS 113
Introduction to Astronomy
Practice Test #1

MULTIPLE CHOICE: (Choose the best answer)

1. In a spectrum, bright lines that appear at wavelengths where there is more radiation than at neighbouring wavelengths are called
a) absorption lines b) emission lines c) Fraunhofer lines d) continuum lines e) none of the above
2. When a gas takes energy away, at a particular wavelength, from radiation passing through it, it creates
a) a continuous spectrum b) an emission line c) an emission spectrum d) an absorption line e) an absorption spectrum
3. When a dense gas or solid body is heated to high temperatures the result is
a) a continuous spectrum b) an emission line c) an emission spectrum d) an absorption line e) an absorption spectrum
4. The magnitude of a star, based on how bright it appears, is its
a) absolute magnitude b) apparent magnitude c) luminous magnitude d) UBV magnitude e) visible magnitude
5. The vast majority, about 90 per cent of the atoms and nuclei in the Universe is
a) helium b) hydrogen c) heavy elements d) gas e) none of the above
6. A light year is defined as
a) the speed of light in a vacuum b) the average distance from the Earth to the Sun c) the length of the solar year d) the distance light travels in one year e) the distance from the Sun to the nearest star
7. A hypothesis is a(n)
a) proven fact b) scientific theory c) unit of measurement d) educated guess e) law of nature
8. Since ancient times, people have divided the sky into regions containing fairly distinct groups of stars called
a) clusters b) coordinates c) constellations d) galaxies e) nebulae
9. The annual path of the Sun through the sky, with respect to the stars, is the
a) celestial equator b) celestial sphere c) ecliptic d) equinox e) prime meridian
10. The first day of Spring occurs in late March and is determined by where the Sun crosses the celestial equator, at a point called the
a) autumnal equinox b) vernal equinox c) hour circle d) meridian e) zenith
11. Stars near the celestial poles appear to move in
a) arcs b) circles c) ellipses d) parabolas e) straight lines
12. Johannes Kepler's theory was based upon his analysis of the extremely accurate observations made by the Danish nobleman
a) Tycho Brahe b) Nicholas Copernicus c) Galileo Galilei d) Ptolemy e) none of the above

13. The ability to distinguish fine detail or to distinguish two adjacent objects as separate is
a) reflection b) diffraction c) aperture d) resolution e) spectroscopy
14. The type of electromagnetic radiation with a wavelength just longer than that of red light is
a) radio waves b) x-rays c) infrared radiation d) gamma rays e) ultraviolet radiation
15. The Hubble Space Telescope is a(n)
a) ground-based refracting telescope b) ground-based reflecting telescope c) orbiting refracting telescope d) orbiting reflecting telescope e) none of the above
16. Ignoring the effect of the Earth's atmosphere, the larger the objective mirror of a reflecting telescope the
a) better the light-gathering power b) better the resolution c) better the light-gathering power and resolution d) better the light-gathering power, but not the resolution e) none of the above
17. A spectral line is created by the movement between allowed energy levels of a(n)
a) electron b) ion c) neutron d) nucleus e) proton
18. For any location on the Earth there is a point directly overhead in the sky called the
a) autumnal equinox b) vernal equinox c) hour circle d) meridian e) zenith
19. The following stars have the following apparent magnitudes:
a) Sirius (-1.5) b) Vega (0.0) c) Antares (0.9) d) Fomalhaut (1.75) e) Sun (-25)
Which star appears dimmest to an observer on Earth?
20. Two stars have the same apparent brightness but one is three times farther away. The actual brightness of the farther star compared to the nearer one is a factor of ____ times brighter.
a) 9 b) 6 c) 1 d) 1/6 e) 1/9
21. The continuous spectrum of the Sun has its maximum intensity (brightness) at a wavelength of
a) 0.5 metres b) 0.5 microns c) 0.5 nm d) 0.5 AU e) 0.5 Angstroms
22. Star A has a magnitude of 6 and star B has a magnitude of 11. Which is correct?
a) Star A is 100 times fainter b) Star B is 100 times fainter c) Star A is 10 times fainter d) Star B is 10 times fainter e) none of the above

SHORT ANSWERS:

1. Explain the difference in the apparent motions of stars near the poles versus those near the celestial equator.
2. Why is Mauna Kea in Hawaii a good site for telescopes?
3. What are the advantages of the Hubble Space Telescope over ground-based telescopes?
4. An absorption line from a gas at rest has a frequency of 10^6 Hz. The same line in a star has a frequency of 1.1×10^6 Hz. What is the speed of the star (along our line of sight). Is it moving away from or towards us?
5. How are stellar (surface) temperatures determined?