

# BROCK UNIVERSITY

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Test 1: October 2016  
Course: ASTR 1P01, Section 2  
Examination date: 1 October 2016  
Time of Examination: 12:00 – 12:50

Number of pages: 9  
Number of students: 1,299  
Time limit: 50 min  
Instructor: S. D'Agostino

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**Answer all questions on the scantron sheet provided.**

**No aids permitted except for a non-programmable calculator.**

**Each question is worth 1 mark. Total number of marks: 50.**

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1. A light year
  - (a) is the average distance between the Earth and the Sun.
  - (b) is the time needed for light to vibrate for a year.
  - (c) is the distance light can travel in a year.
  - (d) is the mass of light that can persist for a year.
2. An astronomical unit
  - (a) is the average distance between the Earth and the Sun.
  - (b) is the time needed for light to vibrate for a year.
  - (c) is the approximate mass of an average star.
  - (d) is the approximate diameter of an average galaxy.
3. It takes light emitted by the Sun about 500 s to reach Earth. The speed of light is about 300,000 km/s. The distance from the Sun to Earth is about
  - (a) 150 thousand km
  - (b) 150 million km
  - (c) 150 billion km
  - (d) 150 trillion km
4. It takes the Earth about \_\_\_\_\_ to travel on its orbit once around the Sun.
  - (a) 1 day
  - (b) 1 month
  - (c) 1 year
  - (d) 365.25 years
  - (e) 200 million years

5. It takes the Earth about \_\_\_\_\_ to rotate once on its axis.
- (a) 1 day
  - (b) 1 month
  - (c) 1 year
  - (d) 365.25 years
  - (e) 200 million years
6. The Sun is
- (a) much hotter and brighter than an average star.
  - (b) a fairly average, typical star.
  - (c) much dimmer and cooler than an average star.
  - (d) not a star.
7. The radius of the orbit of Mars around the Sun is about \_\_\_\_\_ times the radius of Earth's orbit around the Sun.
- (a) 1.5
  - (b) 150
  - (c) 15,000
  - (d) 1,500,000
8. Planets in our solar system are visible to us because
- (a) we use night-vision telescopes to view them.
  - (b) they produce their own light.
  - (c) they reflect the galaxy's light.
  - (d) they reflect the Sun's light.
9. The Milky Way
- (a) contains billions of galaxies.
  - (b) contains millions of galaxies.
  - (c) contains thousands of galaxies.
  - (d) contains the Sun, the solar system, and many other stars, but no other galaxies.
10. The radius of the Earth is about
- (a) 6,400 km.
  - (b) 6,400,000 km.
  - (c) 6,400,000,000 km.
  - (d) 6,400,000,000,000 km.

11. The distance from the Earth to the Moon is about
  - (a) 400 km.
  - (b) 400,000 km.
  - (c) 400,000,000 km.
  - (d) 400,000,000,000 km.
12. The universe is believed to have an age of about
  - (a) 14 thousand years.
  - (b) 14 million years.
  - (c) 14 billion years.
  - (d) 14 trillion years.
13. The planets change their positions relative to the stars because
  - (a) of the rotation of the Earth.
  - (b) of the Sun's motion along the ecliptic.
  - (c) of the gravitational attraction between the planets.
  - (d) planets move in their orbits around the sun.
14. The Milky Way contains
  - (a) hundreds of thousands of stars.
  - (b) hundreds of millions of stars.
  - (c) hundreds of billions of stars.
  - (d) hundreds of trillions of stars.
15. The Kuiper belt, which contains nuclei of short-period comets, lies past the orbit of Neptune, at a distance from the Sun of about
  - (a) 30 AU to 60 AU.
  - (b) 30 thousand AU to 60 thousand AU.
  - (c) 30 million AU to 60 million AU.
  - (d) 30 billion AU to 60 billion AU.
16. The Oort cloud, which contains nuclei of long-period comets, lies in the outer reaches of the solar system, at a distance from the Sun of about
  - (a) 50 AU to 100 AU.
  - (b) 50 thousand AU to 100 thousand AU.
  - (c) 50 million AU to 100 million AU.
  - (d) 50 billion AU to 100 billion AU.

17. The distance between the Sun and the star closest to the Sun is about
- (a) 4 light years.
  - (b) 4 thousand light years.
  - (c) 4 million light years.
  - (d) 4 billion light years.
18. The diameter of the visible disk of the Milky Way is about
- (a) 100 AU.
  - (b) 100,000 AU.
  - (c) 100 light years.
  - (d) 100,000 light years.
19. A constellation is
- (a) a collection of galaxies that are close together in space.
  - (b) a collection of galaxies that appear close together in the sky.
  - (c) a collection of stars that are close together in space.
  - (d) a collection of stars that appear close together in the sky.
20. The Sun rises in the \_\_\_\_\_ and sets in the \_\_\_\_\_ .
- (a) east, west
  - (b) west, east
  - (c) north, south
  - (d) south, north
21. In their daily motions, stars rise in the \_\_\_\_\_ and set in the \_\_\_\_\_ .
- (a) east, west
  - (b) west, east
  - (c) north, south
  - (d) south, north
22. At a particular viewing location on Earth, a circumpolar star is a star
- (a) that has been named by ancient people after polar bears and other polar creatures.
  - (b) that emits polarized light.
  - (c) that never rises or sets.
  - (d) that is about half-way between the north pole and the south pole.

23. Stars that rise every evening rise about \_\_\_\_\_ each night.
- (a) 4 minutes earlier
  - (b) 4 minutes later
  - (c) 50 minutes earlier
  - (d) 50 minutes later
24. The ecliptic is
- (a) a type of illegal hit on kick returns.
  - (b) the location in space where eclipses occur.
  - (c) the location in space where the zodiac intersects with the horizon.
  - (d) the imaginary line on the celestial sphere where the plane of the Earth's orbit intersects it.
25. The Earth's North Pole is tipped most closely towards the Sun on
- (a) the vernal equinox, which occurs on about March 20th.
  - (b) the summer solstice, which occurs on about June 21st.
  - (c) the autumnal equinox, which occurs on about September 22nd.
  - (d) the winter solstice, which occurs on about December 21st.
26. The apparent visual brightness of a star, as observed on Earth, is measured on a scale that is called by astronomers
- (a) apparent visual light level.
  - (b) apparent visual magnitude.
  - (c) apparent visual optical albedo.
  - (d) apparent visual spectral helio-endoscopy.
27. At the equinoxes, the Sun rises in St. Catharines
- (a) directly in the east.
  - (b) a little north of east.
  - (c) a little south of east.
  - (d) directly in the west.
28. At the equinoxes, the number of hours between sunrise and sunset in St. Catharines is
- (a) less than 12.
  - (b) exactly 12.
  - (c) more than 12.

29. In St. Catharines, after the summer solstice and before the winter solstice, the Sun rises a little farther \_\_\_\_\_ each day.
- (a) north of east.
  - (b) south of east.
  - (c) east of north.
  - (d) east of south.
30. In St. Catharines, after the summer solstice and before the winter solstice, the Sun sets a little farther \_\_\_\_\_ each day.
- (a) north of west.
  - (b) south of west.
  - (c) west of north.
  - (d) west of south.
31. A new moon occurs when
- (a) the Moon lies approximately between the Earth and the Sun.
  - (b) the Earth lies approximately between the Moon and the Sun.
  - (c) the Sun lies approximately between the Earth and the Moon.
  - (d) the Sun, Earth, and Moon form an approximate right angle.
32. The phase of the Moon is third quarter when
- (a) the Moon lies approximately between the Earth and the Sun.
  - (b) the Earth lies approximately between the Moon and the Sun.
  - (c) the Sun lies approximately between the Earth and the Moon.
  - (d) the Sun, Earth, and Moon form an approximate right angle.
33. The full moon rises at about
- (a) noon.
  - (b) sunset.
  - (c) midnight.
  - (d) sunrise.
34. The new moon rises at about
- (a) noon.
  - (b) sunset.
  - (c) midnight.
  - (d) sunrise.

35. The Earth's rotation axis precesses, and goes through one complete cycle in about
- (a) 26 days.
  - (b) 26 years.
  - (c) 26,000 years.
  - (d) 26,000,000 years.
36. If the Moon sets a few hours before sunset, then its phase is
- (a) waxing crescent.
  - (b) waning crescent.
  - (c) waxing gibbous.
  - (d) waning gibbous.
37. If the Moon rises a few hours before sunrise, then its phase is
- (a) waxing crescent.
  - (b) waning crescent.
  - (c) waxing gibbous.
  - (d) waning gibbous.
38. If the Moon rises a few hours before sunset, then its phase is
- (a) waxing crescent.
  - (b) waning crescent.
  - (c) waxing gibbous.
  - (d) waning gibbous.
39. If the Moon sets a few hours before sunrise, then its phase is
- (a) waxing crescent.
  - (b) waning crescent.
  - (c) waxing gibbous.
  - (d) waning gibbous.

40. The first-quarter moon sets at about
- (a) sunrise.
  - (b) mid-day.
  - (c) sunset.
  - (d) the middle of the night.
41. The third-quarter moon sets at about
- (a) sunrise.
  - (b) mid-day.
  - (c) sunset.
  - (d) the middle of the night.
42. The seasons on Earth are caused by
- (a) variation in the distance between the Earth and the Sun as the Earth orbits the Sun.
  - (b) variation in the distance between the Moon and the Earth as the Moon orbits the Earth.
  - (c) the Earth's rotation axis being tilted relative to the plane of Earth's orbit around the Sun.
  - (d) the Earth's rotation axis being tilted relative to the plane of Moon's orbit around the Earth.
43. During a solar eclipse,
- (a) the Sun lies directly between the Earth and the Moon.
  - (b) the Earth lies directly between the Sun and the Moon.
  - (c) the Moon lies directly between the Earth and the Sun.
  - (d) the Earth, Moon, and Sun form a right angle.
44. During a lunar eclipse,
- (a) the Sun lies directly between the Earth and the Moon.
  - (b) the Earth lies directly between the Sun and the Moon.
  - (c) the Moon lies directly between the Earth and the Sun.
  - (d) the Earth, Moon, and Sun form a right angle.
45. A sidereal day is about \_\_\_\_\_ than a solar day.
- (a) 4 minutes longer
  - (b) 4 minutes shorter
  - (c) 50 minutes longer
  - (d) 50 minutes shorter

46. The day of the year that has the longest period of daylight is
- (a) the vernal (spring) equinox.
  - (b) the summer solstice.
  - (c) the autumnal equinox.
  - (d) the winter solstice.
47. The day of the year that has the shortest period of daylight is
- (a) the vernal (spring) equinox.
  - (b) the summer solstice.
  - (c) the autumnal equinox.
  - (d) the winter solstice.
48. The amount of time between a solar eclipse and a lunar eclipse can be as short as about
- (a) one week.
  - (b) two weeks.
  - (c) three weeks.
  - (d) four weeks.
49. The cycle of the Moon's phases repeats approximately once every
- (a) day.
  - (b) 29.5 days.
  - (c) six months.
  - (d) year.
50. The constellations of the Zodiac lie along the
- (a) ecliptic.
  - (b) celestial equator.
  - (c) celestial seasonings.
  - (d) celestial tuning fork.