

BROCK UNIVERSITY

Test 1: Fall 2018

Course: ASTR 1P01, Section 2

Examination date: 29 September 2018

Time of Examination: 13:00 – 13:50

Number of pages: 9

Number of students: 1300

Time limit: 50 min

Instructor: S. D'Agostino

Answer all questions by filling in the bubbles with pencil on the answer sheet provided. No aids permitted except for a non-programmable calculator. Each question is worth 1 mark. Total number of marks: 50.

You may use your question page for rough work (for example, to draw diagrams or notes), but **DO NOT WRITE YOUR ANSWERS ON YOUR QUESTION PAGE**. If you wish, you may discreetly circle your answers on your question page.

1. It takes light approximately _____ to travel from the Sun to the centre of our galaxy.
 - (a) 4 seconds
 - (b) 4 minutes
 - (c) 4 hours
 - (d) 4 months
 - (e) [None of the above.]
2. The distance between the Sun and the star nearest the Sun is about
 - (a) a few AU.
 - (b) a few light-years.
 - (c) a few thousand kilometres.
 - (d) a few million kilometres.
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. Stars in the Milky Way galaxy are separated from one another by an average of about
 - (a) a few AU.
 - (b) a few thousand AU
 - (c) a few light-years.
 - (d) a few thousand light-years.

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5. In one year, the Earth rotates on its axis about
- (a) once.
 - (b) 12 times.
 - (c) 365 times.
 - (d) 26,000 times.
 - (e) [None of the above.]
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 Venus around the Sun is _____ the radius of Mercury's orbit around the Sun.
- (a) less than
 - (b) nearly equal to
 - (c) greater than
8. Planets in our solar system are visible to us because
- (a) we use night-vision goggles to view them.
 - (b) they produce their own light.
 - (c) they reflect the Sun's light.
 - (d) they reflect the Sun's light and produce their own 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 diameter of the Earth is about
- (a) 1,300 km.
 - (b) 13,000 km.
 - (c) 26,000 km.
 - (d) 150,000,000 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. As seen by an observer on the Earth, the Sun apparently
 - (a) rises roughly in the East and sets roughly in the West.
 - (b) rises roughly in the West and sets roughly in the East.
 - (c) rises roughly in the East and sets roughly in the East.
 - (d) rises roughly in the West and sets roughly in the West.
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 thousand light years.
 - (b) 4 million light years.
 - (c) 4 billion light years.
 - (d) [None of the above.]
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. An asterism 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 named grouping of stars that is special recognized constellation.
 - (d) a named grouping of stars that is not one of the recognized constellations.
20. The Moon 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, stars that never rise or set are called
- (a) ecliptic stars.
 - (b) polarized stars.
 - (c) circumpolar stars.
 - (d) equatorial stars.

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 stars that you will see tonight (if the skies are clear) depend most strongly on your
- (a) latitude.
 - (b) longitude.
 - (c) ecliptic.
25. As seen from the Earth, the angular size of the Moon is _____ the angular size of the Sun.
- (a) greater than
 - (b) nearly equal to
 - (c) less than
 - (d) [The Moon is too close to the Earth to have an angular size.]
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 sets 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 winter solstice, the number of hours after sunrise and before sunset in St. Catharines is
- (a) less than 12.
 - (b) exactly 12.
 - (c) more than 12.

29. In St. Catharines, after the winter solstice and before the spring equinox, 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 fall equinox 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 full 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 sets at about
- (a) noon.
 - (b) sunset.
 - (c) midnight.
 - (d) sunrise.

35. The plane of the Moon's orbit around the Earth is tipped relative to the plane of the Earth's orbit around the Sun by an angle of about
- (a) 1° .
 - (b) 5° .
 - (c) 13° .
 - (d) 23° .
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 sunset, 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 the middle of the night, 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 third-quarter moon sets at about
- (a) sunrise.
 - (b) mid-day.
 - (c) sunset.
 - (d) the middle of the night.

41. The first-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) the Earth being closer to the Sun in the summer and farther away from the Sun in the winter.
 - (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. 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
44. On the day of the autumnal (fall) equinox,
- (a) the Sun changes from rising farther north of east every day to rising farther south of east every day.
 - (b) the Sun changes from rising farther south of east every day to rising farther north of east every day.
 - (c) the Sun rises directly east.
 - (d) [None of the above.]
45. On the day of the summer solstice,
- (a) the Sun changes from rising farther north of east every day to rising farther south of east every day.
 - (b) the Sun changes from rising farther south of east every day to rising farther north of east every day.
 - (c) the Sun rises directly east.
 - (d) [None of the above.]

46. 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.
47. The cycle of the Moon's phases repeats approximately once every
- (a) day.
 - (b) 29.5 days.
 - (c) six months.
 - (d) year.
48. The constellations of the Zodiac lie along the
- (a) ecliptic.
 - (b) celestial equator.
 - (c) celestial seasonings.
 - (d) celestial tuning fork.
49. 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.
50. 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.