BROCK UNIVERSITY

Test 1: May 2017
Course: ASTR 1P01, Section 1
Examination date: 13 May 2017
Time of Examination: 13:00 – 13:50

Number of pages: 9
Number of students: 614
Time limit: 50 min
Instructor: S. D'Agostino

Answer all questions on the scantron sheet provided. No aids permitted except for a non-programmable calculator (this regulation does not preclude special arrangements being made for students with disabilities). Translation dictionaries (e.g., English-French) or other dictionaries (thesaurus, definitions, technical) are not allowed. Use or possession of unauthorized materials or electronic devices will result in a charge of academic misconduct under the University's Academic Integrity Policy.

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

Return both the exam script and your scantron sheet when you leave the exam room.

DO NOT WRITE YOUR ANSWERS ON YOUR QUESTION PAGE. DOING SO WILL RESULT IN AN ASSIGNED GRADE OF ZERO.

1. The radius of the Earth is about
   (a) 6.4 km.
   (b) 6,400 km.
   (c) 6,400,000 km.
   (d) 6,400,000,000 km.
2. The distance between the Earth and the nearest star outside our solar system is
   (a) 4 AU
   (b) 4,000 AU
   (c) 4 light years
   (d) 4,000 light years
3. The distance between the Earth and the Sun is about
   (a) 150 thousand km
   (b) 150 million km
   (c) 150 billion km
   (d) 150 trillion km

4. It takes light approximately _____ to travel from the Sun to the Earth.
   (a) 8 seconds
   (b) 8 minutes
   (c) 8 hours
   (d) 8 months
   (e) 8 years
5. Looking down on the Earth from far above the North Pole, an observer would see the Earth rotating on its axis
   (a) clockwise.
   (b) counter-clockwise.
   (c) sideways.
   (d) upside-down.
   (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 planet Venus is
   (a) much smaller than the Earth.
   (b) about the same size as the Earth.
   (c) much larger than the Earth.
8. The distance from the Sun to the planet Mars is about
   (a) 1.5 AU.
   (b) 15 AU.
   (c) 150 AU.
   (d) 1,500 AU.
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. Canadian astronomer Andrew McKellar was the first person to measure the _____ of the interstellar medium.

    (a) density
    (b) mass
    (c) pressure
    (d) temperature

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 distance from the Sun to Neptune is about

    (a) 30 light minutes.
    (b) 30 light hours.
    (c) 30 light years.
    (d) 30 AU.

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. Nuclei of short-period comets are found in

    (a) the asteroid belt.
    (b) the Kuiper belt.
    (c) the Oort cloud.
    (d) the rings of Saturn.

16. Nuclei of long-period comets are found in

    (a) the asteroid belt.
    (b) the Kuiper belt.
    (c) the Oort cloud.
    (d) the rings of Saturn.

17. To an observer on Earth, the Milky Way appears to be a diffuse band of light across the sky because

    (a) of gravitational lensing.
    (b) of diffraction effects in the Earth's atmosphere.
    (c) of cosmological redshift.
    (d) the Milky Way is disk-shaped.

18. The distance of the solar system from the centre of the Milky Way is approximately

    (a) 30 AU.
    (b) 30,000 AU.
    (c) 30 light years.
    (d) 30,000 light years.

19. The local group is an example of

    (a) a poor galaxy cluster.
    (b) a rich galaxy cluster.
    (c) a constellation.
    (d) an asterism.
    (e) a zodiac sign.

20. Superclusters of galaxies are aligned to form cosmic

    (a) superhighways.
    (b) elliptical galaxies.
    (c) spiral galaxies.
    (d) filaments.

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. The portion of the night sky that an observer on Earth sees during an entire clear night depends on the time of year and the observer's

    (a) altitude.
    (b) latitude.
    (c) longitude.
    (d) parallax.

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 Big Dipper is an example of

    (a) an asterism.
    (b) a constellation.
    (c) a galaxy.
    (d) a nebula.

25. A rich galaxy cluster contains

    (a) more than 10 galaxies.
    (b) more than 100 galaxies.
    (c) more than 1,000 galaxies.
    (d) more than 10,000 galaxies.

26. The magnitude of a star is a measure of the star's

    (a) brightness.
    (b) density.
    (c) mass.
    (d) pressure.
    (e) radius.

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 winter solstice and before the summer 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 Sun lies approximately between the Earth and the Moon.
    (b) the Sun, Earth, and Moon form an approximate right angle.
    (c) the Moon lies approximately between the Earth and the Sun.
    (d) the Earth lies approximately between the Moon and the Sun.

32. The phase of the Moon is first quarter when

    (a) the Sun lies approximately between the Earth and the Moon.
    (b) the Sun, Earth, and Moon form an approximate right angle.
    (c) the Moon lies approximately between the Earth and the Sun.
    (d) the Earth lies approximately between the Moon and the Sun.

33. The full moon sets 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 after 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 after 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 after sunrise, then its phase is
    (a) waxing crescent.
    (b) waning crescent.
    (c) waxing gibbous.
    (d) waning gibbous.

40. The first-quarter moon rises at about
    (a) sunrise.
    (b) mid-day.
    (c) sunset.
    (d) the middle of the night.
41. The third-quarter moon rises 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 Earth-Sun distance as the Earth orbits the Sun.
    (b) variation in the Moon-Earth distance as the Moon orbits the Earth.
    (c) the Earth's rotation axis being tilted relative to the plane of the Earth's orbit around the Sun.
    (d) the Earth's rotation axis being tilted relative to the plane of the 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. The northern hemisphere of the Earth is colder in December than in July because
    (a) the northern hemisphere has a smaller amplitude of oscillation in December.
    (b) the Earth is farther from the Sun in December.
    (c) the Sun's rays are spread over a larger area in the northern hemisphere in December.
    (d) the Moon's tidal forces are more effective at cooling the oceans in the northern hemisphere.

46. The winter solstice is the day of the year on which
    (a) planetary alignment produces peace, harmony, and good will towards all humans.
    (b) the Earth's axis is tipped towards the Sun by the greatest amount.
    (c) the Earth's axis is tipped towards the Sun by the least amount.
    (d) the period of daylight is the greatest.
    (e) the Sun lies directly on the celestial prime meridian.
47. The autumnal equinox is a day of the year on which
    (a) not a creature stirs, not even a mouse.
    (b) the Sun rises in the direction of the North Star.
    (c) the Sun lies directly on the celestial prime meridian.
    (d) the period of daylight is exactly equal to the period of night.
    (e) [None of the others.]
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) month.
    (c) six months.
    (d) year.
50. The constellations of the Zodiac lie along the
    (a) celestial equator.
    (b) celestial seasonings.
    (c) celestial prime meridian.
    (d) ecliptic.