Midterm 1 is this week, Thursday February 10 @12pm.

- Material from textbook + lectures + homeworks, Chapters 1,2,3,4,5,6.
- 50 min for 50 multiple-choice questions, closed book/notes. Scantrons will be provided.
- Don't be late, exam starts promptly at noon. Bring #2 pencil and eraser.
- No class the day of midterm.
- No make-up exams (only 2 best midterm scores will count towards your final grade).
- USC code of ethics applies (no phones, no talking)

How to study?

- ✓ Work through in-class questions.
- ✓ Work through homeworks.
- ✓ Work through example midterm questions.
- ✓ Work through the preparation today.
- ✓ Work through end-of-chapter textbook questions.

- ✓ Ask ”why” and “why not” questions as you study, don’t just look through the answers!
- ✓ Come to office hour or email if you have questions! (Please don’t rely on my email response after 4pm on the day before exam).

Name_____ ID#_____

ASTR 100 – section 50800 – Spring 2022
Instructor: Vera Gluscevic

February 10, 2022

Midterm exam 1
PRACTICE

Please answer all of the following questions on the scantron sheet provided. **Make sure that your full name and your student ID number are on the answer sheet** and that all answers are recorded in the correct position. **Always select the best answer**. Only one choice counts as a correct answer and each correctly answered question is worth 1 point; unanswered question or incorrect answer is 0 points. This is a closed-book, closed-note exam and you have **50 minutes** to complete it.
If you have questions, please raise your hand. **You are not allowed to talk or attempt to obtain answers from other students or from an electronic device for any reason.**

DO NOT START THE EXAM UNTIL YOU ARE TOLD TO DO SO.

1. How old is the Universe?

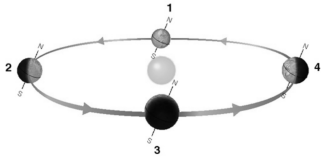
    a. 13.7 million years.
    b. 13.7 billion years.
    c. 13.7 trillion years.
    d. More than 13.7 trillion years.

2. The photo on the right most likely shows _____ .

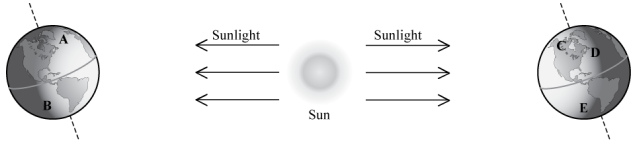
    a. A planet
    b. A star
    c. A comet
    d. An asteroid
    e. The Moon

3. Which position in this diagram on the right represents Earth on the day that we have the shortest amount of daylight in Los Angeles, in the northern hemisphere?

    a. 1
    b. 2
    c. 3
    d. 4
    e. all four positions



4. How many of the locations on the Earth, shown in the diagram below (A-E), would be experiencing summer?

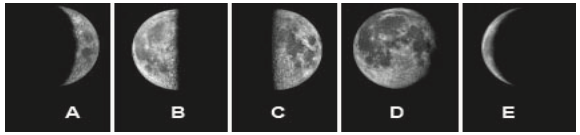


Note: this drawing is not to scale. In fact you could fit more than 11,000 Earths between the Sun and Earth.

a. only one
b. two
c. three
d. four
e. all the positions are experiencing winter.

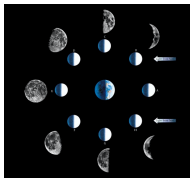
5. If the moon is in the waxing gibbous phase today, how many of the phases shown below (A-E) would the moon go through during the next 12 days.

a. only one
b. two
c. three
d. more than three
e. none



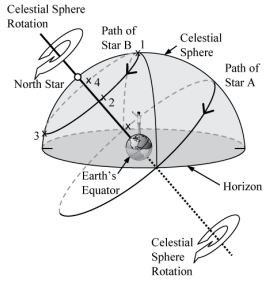
6. Which of the following groups of moon phases is above the horizon at noon?

a. Full Moon, Waning Crescent, and Waxing Gibbous
b. Full Moon, First Quarter, and Waxing Gibbous
c. Waxing Gibbous, New Moon, Waning Gibbous
d. Waxing Crescent, New Moon, Waning Crescent
e. None. The moon is only visible above the horizon during the night time.



7. If the star A in the diagram below rises at noon, when and where does it set, for the observer shown here?

a. It sets due west at 9pm.
b. It sets due northwest at 9pm.
c. It sets due west at midnight.
d. It sets due southwest at midnight.
e. It never sets.



8. If Sirius rises at 9am exactly today, what time will it rise tomorrow, for the same person in the same location?
   a. 9am
   b. 8.56am
   c. 9.04am
   d. It depends on the time of the year
   e. It's impossible to tell without more information

9. Suppose you drop a feather and a hammer on the Moon from the same height at the same time. Why do they hit the ground at the same time?
    a. Because the force of gravity that attracts them is the same.
    b. Because the Moon gives them the same acceleration.
    c. Because their weights are the same on the Moon.
    d. Because there is too little air resistance.

10. What is the difference between a *bound* orbit and an *unbound* orbit around the Sun?
    a. An object on a bound orbit follows the same path around the Sun over and over, while an object on an unbound orbit approaches the Sun just once and then never returns.
    b. A bound orbit is an orbit allowed by the universal law of gravitation, and an unbound orbit is not.
    c. An object on a bound orbit has a gravitational attraction to the Sun, while an object on an unbound orbit does not.
    d. A bound orbit is circular, while an unbound orbit is elliptical.

11. Two with a mass of 10^{21} kg each, attract each other with a gravitational force. If you were to, somehow, double the mass of each asteroid, keeping their distance the same, how much stronger would be the force of their gravitational attraction?
    a. Twice as strong
    b. Half as strong
    c. Four times as strong
    d. Eight times as strong

12. Which of the following has the highest energy?
    a. A photon of ultraviolet light.
    b. Blue electromagnetic radiation.
    c. A radio wave.
    d. It depends in the wavelength.