

Quiz # 1

At the end of the quiz hand in all pages of the booklet.

Materials permitted: Calculator and one 8½" x 11" sheet of paper

Table of Values:

Gravitational Constant, G	6.7	$\times 10^{-11}$	N m ² kg ⁻²
Astronomical Unit, A.U.	1.5	$\times 10^{11}$	m
Mass of the Sun, M _☉	2	$\times 10^{30}$	kg
Radius of the Sun, R _☉	7	$\times 10^8$	m
Mean radius of Moon's orbit	3.84	$\times 10^8$	m
Speed of light, c	3	$\times 10^8$	m s ⁻¹

Section A: Multiple choice (20/80, i.e. 25% of the Quiz Total)

10 questions worth 2 points each

Circle the letter corresponding to the most appropriate answer to each

- A1) Halifax to Fredericton is 300 km. What is the angle between them, viewed from the moon?
a) 2.5' b) 0.75° c) 1300° d) 2.5° /2
- A2) If Venus is seen with a diameter of 30", compare to the apparent diameter of the Moon
a) 1/3600 b) 1/30 c) 60 x d) 1/60 /2
- A3) The change in tilt of Earth's axis with respect to the Stars after six months has elapsed:
a) 0° b) 23.5° c) 47° d) 180° /2
- A4) The declination of the Sun on December 21st will be:
a) 23.5° b) 90° c) 0.5° d) -23.5° /2
- A5) The First Point of Aries is presently in:
a) Ursa Major b) Pisces c) Aquarius d) Aries /2
- A6) When does the full moon rise?
a) noon b) sunset c) sunrise d) midnight /2
- A7) The period of a comet is 64 years; its perihelion distance 1 AU. What is its aphelion distance?
a) 1 A.U. b) 16 A.U. c) 31 A.U. d) 65 A.U. /2
- A8) A transit of Mercury can only occur at:
a) opposition b) perihelion c) inferior conjunction d) greatest elongation /2
- A9) Halley's Comet has a period of 76 years. What is the semi-major axis of its orbit?
a) 17.5 A.U. b) .59 A.U. c) 1 A.U. d) 76 A.U. /2
- A10) If you see a *First Quarter Moon* at sunset in late September, which way are you looking?
a) East b) Zenith c) West d) Winter Solstice /2

Section B (25%)

10 questions worth 2 points each

Answer each question in the space provided

What *name* describes each of the following?

B1) The Danish astronomer whose observations of the position of the planet Mars led Kepler to his Laws. _____ /2

B2) The person who first showed that the planetary orbits are ellipses _____ /2

B3) The great circle on the celestial sphere that passes through the zenith and the north and south celestial poles. _____ /2

B4) The point on a planet's orbit where it crosses the ecliptic going South. _____ /2

B5) What we get when the Full Moon is at a node. _____ /2

B6) A period of time, known to the ancients, between similar eclipses. _____ /2

B7) The angle between the Sun and a body as viewed from the Earth. _____ /2

B8) Any apparent motion in the sky that *repeats* on a *daily* basis, such as the rising (or setting) of stars _____ /2

B9) An apparent *westward* motion of a planet with respect to the stars _____ /2

B10) The point in its orbit where a body is *farthest* from the Sun. _____ /2

Section C (25%)
Answer each question in the space provided

A certain asteroid has a perihelion distance of 2 A.U. and an aphelion distance of 6 A.U.

C1) What is the semi-major axis of its orbit?

C2) What is its sidereal period?

C3) What is the eccentricity of its orbit?

C4) What is the semi-minor axis of its orbit?

C5) If this orbit were around a star of $2M_{\odot}$, instead of the Sun, what would be its period?

_____ /4

_____ /4

_____ /4

_____ /4

_____ /4

Section D (25%)
5 questions worth 4 points each
Answer each question in the space provided

In a *few sentences*, with a *diagram* if useful, explain what is meant by **each** of the following terms

D1) Parsec _____

/4

