

IESO 2012 Written TEST ASTRONOMY

Name _____ Nationality _____

1. The duration of spring and summer in the southern hemisphere is 178.7 days, whilst the duration of autumn and winter is 186.5 days (the opposite is valid for the northern hemisphere). This apparently strange fact is related to: (1.pt)
 - (A) The magnetic field of the Sun affects the velocity of the Earth when it approaches the perihelion
 - (B) The fact that the Earth changes its velocity in accordance to Kepler's Second Law
 - (C) The precession of the Earth
 - (D) The Earth is in its perihelion in July
2. If you were at the North Pole, Polaris would be ... (1.pt)
 - (A) at your zenith
 - (B) at your northern horizon
 - (C) below the horizon
 - (D) It depends on the time of day
3. The magnifying power of a (refracting) telescope can be calculated ...(1.pt)
 - (A) using sophisticated computer simulations
 - (B) from the focal lengths of the two lenses
 - (C) from the diameters of the two lens
 - (D) from the price of the telescope
4. For similar tidal amplitudes in different geographic locations, the surface of beach covered by the water during each tidal cycle is related to: (1.pt)
 - (A) The absolute value of low tide above mean sea level
 - (B) The slope of the beach
 - (C) The influence of local winds on the tide
 - (D) The influence of the local temperature
5. Right ascension is the sky's equivalent to the Earth's ... (1.pt)
 - (A) Latitude
 - (B) Longitude
 - (C) Altitude
 - (D) Meridian
6. Azimuth is the ___?(1.pt)
 - (A) angle, measured in degrees, above the nearest horizon
 - (B) horizontal direction (angle) or bearing of an object in the sky
 - (C) point in the sky (on the "celestial sphere") directly overhead
 - (D) great circle on the celestial sphere that passes through your zenith and also through both celestial poles

7. If your latitude is 30 , what is the most southerly declination of a star to be circumpolar? (2.pt)
- (A) +90
 - (B) +60
 - (C) +30
 - (D) -30
8. The amount of light that a telescope can collect is limited by the telescope's ...(1.pt)
- (A) chromatic aberration
 - (B) focal point
 - (C) aperture
 - (D) eyepiece
9. What is the correct term for the time taken for any object in the Solar System (such as the Moon) to return to the same position relative to the Sun as seen from Earth? (1.pt)
- (A) year
 - (B) solar time
 - (C) sidereal period
 - (D) synodic period
10. The color of a star is mainly due to its ...(1.pt)
- (A) surface temperature
 - (B) composition
 - (C) distance
 - (D) twinkling
11. A superior planet can be seen to retrograde when it is near ...(1.pt)
- (A) conjunction
 - (B) quadrature
 - (C) opposition
 - (D) the Moon
12. When a planet is less than one astronomical unit (AU) from Earth AND shares the same AR as the Sun, that planet must be ...(1.pt)
- (A) Venus
 - (B) Mercury
 - (C) at superior conjunction
 - (D) at inferior conjunction

13. An inferior planet at its greatest eastern elongation is best seen ...(2.pt)

- (A) around midnight
- (B) around noon
- (C) just after sunset
- (D) just before sunrise

14. Two optical telescopes A & B are used to observe the same celestial object. (Assume both have the same transmission rate.)

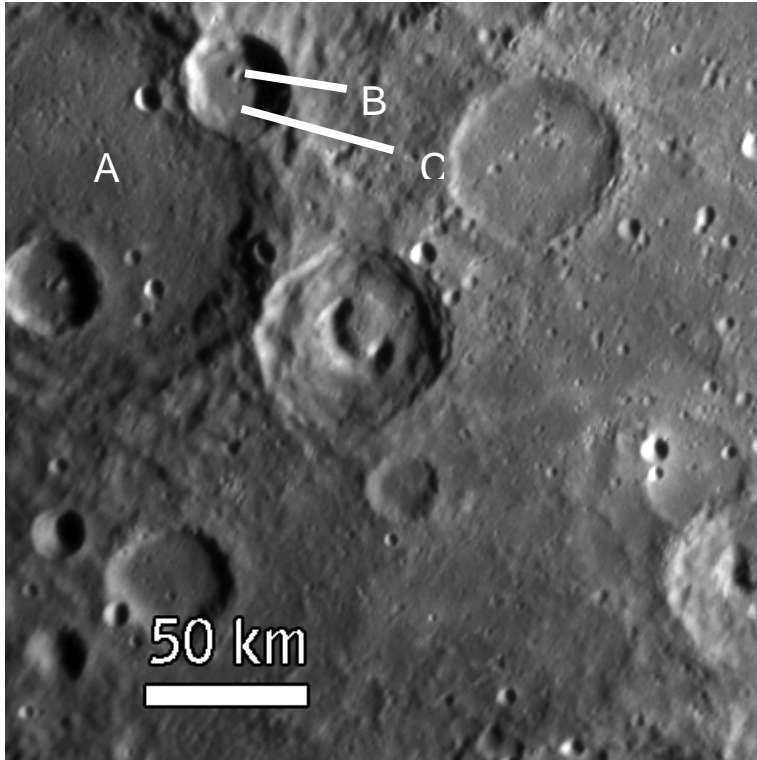
telescope	A	B
diameter	25 cm	100 cm

To obtain the same number of photons, what would be the exposure of telescope A to have the same amount of photons obtained by telescope B? (2.pt)

- (A) 4 times
 - (B) 8 times
 - (C) 16 times
 - (D) 32 times
15. The star Alpha Centauri is approximately 4.0×10^{13} km away from Earth. If Alpha Centauri moves closer like the Moon (about 4.0×10^5 km away), about how much brighter is Alpha Centauri than before? (2.pt)
- (A) 10^8 times
 - (B) 10^{12} times
 - (C) 10^{16} times
 - (D) 10^{24} times
16. If the Sun set below your western horizon about 6 hours ago, and the Moon is barely visible on the eastern horizon. Which phase of the Moon would this be? (2.pt)
- (A) Full Moon
 - (B) First Quarter
 - (C) New Moon
 - (D) Third Quarter
17. If we have our own aircraft and want to fly directly from Albany, Australia ($35^{\circ}1'$ South, $117^{\circ}53'$ East) to Olavarria ($36^{\circ}52'$ South, $60^{\circ}5'$ West), with shortest distance, we will pass through the following region: (2.pt)
- (A) Antarctic
 - (B) South Africa
 - (C) Hawaii
 - (D) New Zealand

18. Dating impact craters

From time to time, the planets are struck by bodies coming from the space. The impact of these bodies on Mercury's surface results in circular structures known as an impact craters. The superimposing relationships between craters provide a useful tool for relative dating of these structures. Please carefully analyze the photo below. Which of the options below is the correct sequence from oldest to youngest? : (2.pt)



- (A) A - B - C
- (B) A - C - B
- (C) B - A - C
- (D) B - C - A