Explorations 10th edition Arny Test Bank

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CORRECT ANSWERS ARE LOCATED IN THE 2ND HALF OF THIS DOC.

TRUE/FALSE - Write 'T' if the statement is true and 'F' if the statement is false.

1) The angular size of an object increases as the distance to the observer increases.
   - ◎ true
   - ◎ false

2) The angular size of the Sun as observed from Earth is about 0.5 degree.
   - ◎ true
   - ◎ false

3) The angular size of the Moon as observed from Earth is about 0.5 degree.
   - ◎ true
   - ◎ false

4) The paths of the planets' orbits lie in all different directions in the sky.
   - ◎ true
   - ◎ false

5) The inability to observe parallax of stars contributed to the ancient Greek astronomers' rejection of the idea that Earth revolves around the Sun.
   - ◎ true
   - ◎ false

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6) The motion of the Sun with respect to the stars is retrograde, i.e., east to west relative to the stars.
   - ◎ true
   - ◎ false

7) During retrograde motion, the planet Mars rises in the west and sets in the east.
   - ◎ true
   - ◎ false

8) Parallax is the shift in a star's apparent position due to Earth's motion around the Sun.
   - ◎ true
   - ◎ false

9) The concept of the epicycle was introduced in the heliocentric model to explain the retrograde motion of the planets.
   - ◎ true
   - ◎ false

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10) In the heliocentric model, the retrograde motion of the planets was explained as the consequence of the different orbital speeds of the planets, without the use of epicycles.
- ◎ true
- ◎ false

11) Copernicus' model was significantly better at predicting future positions of planets than Ptolemy's.
- ◎ true
- ◎ false

12) Galileo deduced many empirical laws of motion before Newton was even born.
- ◎ true
- ◎ false

13) During the month of January, Earth goes through the point of closest approach to the Sun. Using Kepler's Second law we can conclude that Earth moves faster in January than in July.
- ◎ true
- ◎ false

14) In geocentric theories, Earth is assumed to be the center of the solar system.
- ◎ true
- ◎ false

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15) The Sun is located at the center of Earth's elliptical orbit.
- ◎ true
- ◎ false

16) According to Kepler's laws the Sun is located at one of the foci of Earth's orbit.
- ◎ true
- ◎ false

17) Copernicus was able to calculate the distances to the observed planets relative to Earth's distance from the Sun.
- ◎ true
- ◎ false

18) Tycho Brahe relied on the use of telescopes to record his accurate positions for the planets.
- ◎ true
- ◎ false

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MULTIPLE CHOICE - Choose the one alternative that best completes the statement or answers the question.

19) The Moon appears larger when it rises than when it is high in the sky because
- A) you are closer to it when it rises (angular-size relation).
- B) you are farther from it when it rises (angular-size relation).
- C) it's an illusion from comparison to objects on the horizon.
- D) it's brighter when it rises.

20) _____ was the first person to measure the circumference of Earth.
- A) Ptolemy
- B) Copernicus
- C) Eratosthenes
- D) Galileo
- E) Aristarchus

21) When was it first known that Earth was spherical in shape?
- A) it was always known to be spherical
- B) at the time of the Greeks
- C) at the beginning of the Renaissance
- D) only after Galileo used a telescope to study other planets
- E) only recently within the last hundred years

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22) What is the size of an object located at a distance of 1,000 meters and that has angular size A = 4 degrees?
- A) about 11 meters
- B) about 35 meters
- C) about 70 meters
- D) about 4,000 meters

23) One observation supporting the idea of a spherical Earth is that _____.
- A) the shape of Earth's shadow on the Moon during an eclipse is circular
- B) a traveler moving south will see stars they could not previously see
- C) a ship moving away from the observer will move such that the hull is not seen, then the sails disappear over the horizon
- D) all of these choices are correct

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24) The curved shape of Earth's shadow during an eclipse was evidence for _____.
- A) a flat, circular Earth
- B) a spherical Earth
- C) a spherical Moon
- D) a flat, circular Moon
- E) None of these choices is correct

25) Which of the following is a contribution that Eratosthenes made to astronomy?
- A) He determined the circumference of Earth.
- B) He discovered epicycles.
- C) He discovered his Three laws (of Planetary Motion).
- D) He was the first person known to have pointed a telescope at the sky.

26) What is meant by the phrase "angular size"?
- A) an object's diameter
- B) how big an object looks, expressed as an angle
- C) the distance around an object
- D) the angle between two circular objects

27) If you triple your distance from an object, what happens to its angular size?
- A) It decreases by one-half.
- B) It stays the same.
- C) It reduces to one-third of what it was.
- D) It increases by a factor of nine.

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28) The Sun and the Moon have an angular size of approximately _____.
- A) 1 degree
- B) 5 degrees
- C) 0.5 degree
- D) 23.5 degrees
- E) 2.35 degrees

29) The similarity of the Sun's and the Moon's angular sizes allow _____ to occur.
- A) tides
- B) lunar phases
- C) eclipses
- D) sunspots
- E) seasons

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30) The apparent size of an object based on the amount of sky it covers is called its _____.
- A) diameter
- B) shadow-width
- C) horizon
- D) angular size
- E) celestial extent

31) The Sun and the Moon have the same angular size. If the Sun is 400 times farther away than the Moon, the Sun must be _____ times the size of the Moon.
- A) 400
- B) 1/400
- C) 1/4
- D) 4
- E) 4π

32) One of two identical buildings is nearby, the other is twice as far away as the first. The angular size of the more distant building is _____ the nearby building's angular size.
- A) two times
- B) four times
- C) one half
- D) one fourth
- E) the same as

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33) When the Moon is on the horizon, it appears larger than when it is high in the sky. Why?
- A) When it is on the horizon, it is closer to us.
- B) This is an optical illusion.
- C) The brightness of the Moon makes it seem larger.
- D) Earth's atmosphere acts like a lens, magnifying it.
- E) Its angular size is larger on the horizon.

34) One observation that supported an Earth-centered solar system is _____.
- A) retrograde motion
- B) the phases of the Moon
- C) the lack of parallax in the stars
- D) the shape of Earth's shadow on the Moon
- E) the phases of Venus

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35) The shift of a star's apparent position due to Earth's motion around the Sun is called _____.
A) parallax
B) retrograde motion
C) prograde motion
D) geocentricity
E) proper motion

36) The parallax shift of a nearby star would be _____ that of a more distant star.
A) greater than
B) less than
C) the same as
D) brighter than
E) faster than

37) The paths of the planets in the sky are tilted with respect to the celestial equator by about
A) 5 degrees.
B) 23 degrees.
C) 45 degrees.
D) 90 degrees.

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38) One of the methods used to date supernova remnants (the remains of exploded stars) today is by using
A) the notebooks of Galileo.
B) the records of ancient Chinese, Japanese, and Korean astronomers.
C) the works of Ptolemy.
D) Kepler's laws.

39) Which of the following objects passes through the zodiac?
A) Sun
B) Planets
C) Earth and Moon
D) All of these choices are correct.
E) None of these choices is correct.

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40) What is retrograde motion?
- A) east to west motion of the Sun over many successive nights
- B) east to west motion of the Moon relative to the stars over many successive nights
- C) occasional east to west motion of the planets relative to the stars over many successive nights
- D) occasional west to east motion of the planets relative to the stars over many successive nights

41) During retrograde motion, a planet moves from_____ to_____ relative to the stars.
- A) east; west (moves westward)
- B) west; east (moves eastward)

42) Retrograde motion is discernible by watching a planet over the course of
- A) a few minutes.
- B) many hours.
- C) many nights.
- D) many years.

43) During the course of a single night, a planet that is moving in retrograde motion will move
- A) east to west.
- B) west to east.
- C) not at all.
- D) randomly about the sky.

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44) Imagine the much more massive Jupiter were to switch places with the less massive Mercury. Which of the following would accurately describe the outcome?
- A) Jupiter would orbit the Sun in less time than it did before.
- B) Jupiter would orbit the sun in more time than it did before.
- C) Mercury would orbit the Sun in less time than it did before.
- D) The orbital time for each of the planets would not change.

45) Where on the celestial sphere would you look for the planets?
- A) on the celestial equator
- B) on the galactic equator
- C) in the zodiac (near the ecliptic)
- D) at the north celestial pole

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46) If you see a bright "star" in the sky, how could you tell whether it is a star or a planet?
- A) Planets are too dim to be seen without a telescope.
- B) Planets are round; stars have five points.
- C) Planets always appear right next to the Moon.
- D) Look at it several days later—if it's a planet, it will move across the background stars.

47) The planets move _____ through the sky, relative to the background stars.
- A) east to west
- B) west to east
- C) retrograde
- D) northeast to southwest
- E) None of these choices is correct.

48) Of the earliest known planets, which exhibits retrograde motion?
- A) All of these choices are correct
- B) None of these choices is correct
- C) Only Mars
- D) Mercury, Venus, and Mars
- E) Mars and Mercury

49) What do we call it when a planet moves backward (east to west) through the stars?
- A) retrograde motion
- B) the Zodiac
- C) regression
- D) prograde motion

50) Where will a planet in retrograde motion rise?
- A) in the north
- B) in the south
- C) in the east (just like everything else in the sky)
- D) in the west (the opposite of everything else in the sky)

51) The planets (other than Earth) known to ancient Western cultures were _____.
- A) Mercury, Venus, and Mars
- B) Venus, Mars, Jupiter, and Saturn
- C) Venus, Jupiter, Saturn, Uranus, and Neptune
- D) Mercury, Venus, Mars, Jupiter, and Saturn
- E) Mercury, Mars, Jupiter, and Saturn

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52) As the planets orbit the Sun, they are never far from the _____ on the celestial sphere.
A) ecliptic
B) celestial equator
C) horizon
D) celestial pole
E) meridian

53) The path of the planets through the sky is tipped 23.5 degrees from the _____.
A) celestial equator
B) ecliptic
C) zodiac
D) north celestial pole
E) the plane of the galaxy

54) The geocentric model was based on the observation that _____.
A) everything moves around Earth from east to west
B) the sphere was a divine shape
C) crystalline spheres rotated through the sky
D) the Sun and Moon were flawless spheres
E) Earth is motionless in space

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55) One phenomenon that the geocentric models struggled to explain was _____.
A) sunspots
B) the rotation of Earth
C) retrograde motion
D) parallax
E) epicycles

56) An epicycle was used in geocentric models to explain _____.
A) parallax
B) aurora
C) retrograde motion
D) eclipses
E) Earth's circular shadow

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57) Islamic scholars _____.
- A) studied and expanded upon older texts in astronomy
- B) made detailed studies of the motions of the planets
- C) influenced the naming of bright stars
- D) developed algebra
- E) all of these choices are correct

58) Asian astronomers _____.
- A) kept detailed records of unusual celestial events
- B) devised ways to predict eclipses
- C) recorded the existence of sunspots
- D) All of these choices are correct

59) Kepler's Third, or harmonic, law states that the
- A) period of an orbit cubed equals the semi-major axis squared.
- B) semi-major axis of an orbit cubed equals the period squared.
- C) planets move fastest when they are closest to the Sun.
- D) semi-major axis of an orbit is inversely proportional to the period.

60) Copernicus' heliocentric model failed to work as well as it might to predict the positions of planets because Copernicus insisted the orbits were
- A) circular.
- B) elliptical.
- C) circular, mounted on epicycles.
- D) hyperbolic.

61) One of Tycho Brahe's major contributions to astronomy was to prove
- A) that a supernova (exploding star) was much farther away than the planets.
- B) that a comet was outside Earth's atmosphere.
- C) that the Sun was the center of the solar system.
- D) that a supernova (exploding star) was much farther away than the planets, and also that a comet was outside Earth's atmosphere.
- E) that a supernova (exploding star) was much farther away than the planets, that a comet was outside Earth's atmosphere, and that the Sun was the center of the solar system.

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62) The general heliocentric model proposed by Copernicus was appealing, and eventually became preferred, because
A) it explained why we do not observe stellar parallax.
B) it replaced Earth with the Sun as the center of the solar system.
C) it was more aesthetically pleasing than the complicated Ptolemaic model.
D) it made more accurate predictions than the Ptolemaic model.

63) In_____ models, the Sun is assumed as the center of the solar system.
A) Geocentric
B) Anthropomorphic
C) Epicyclic
D) Heliocentric

64) Galileo was the first to observe the phases of_____.
A) the moon
B) Venus
C) Earth
D) the sun

65) In Copernicus' model of the solar system, the planets orbited the_____ in_____ orbits.
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A) Earth; circular
B) Sun; elliptical
C) Sun; circular
D) Earth; elliptical

66) _____ major contribution to astronomy is his extensive series of measurements of planetary positions.
A) Tycho Brahe's
B) Galileo's
C) Kepler's
D) Copernicus’s

67) _____ used the extensive records of planetary positions measured by_____ to discover that the orbits of the planets are_____.
A) Tycho; Kepler; circular
B) Tycho; Kepler; elliptical
C) Kepler; Tycho; elliptical
D) Kepler; Galileo; elliptical

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68) Kepler's_____ law states that the orbits of planets are elliptical, with the Sun at one focus.
A) First
B) Second
C) Third
D) Fourth

69) From Kepler's_____ law, we conclude that the planets do not move with constant speed.
A) First
B) Second
C) Third
D) Fourth

70) From Kepler's_____ law, we conclude that Mars completes a full orbit much faster than Pluto.
A) First
B) Second
C) Third
D) Fourth

71) Observations indicate that it takes Saturn longer than Jupiter to complete one orbit about the Sun. This agrees with which of Kepler's laws?
A) First
B) Second
C) Third
D) Fourth

72) The time between the vernal equinox and the autumnal equinox is somewhat greater than the time between the autumnal equinox and the vernal equinox. This is a result of Kepler's_____ law.
A) First
B) Second
C) Third
D) Fourth

73) Which of the following is a contribution that Kepler made to astronomy?
A) He determined the size of Earth.
B) He discovered epicycles.
C) He discovered his Three laws (of Planetary Motion).
D) He discovered four moons (or satellites) of Jupiter.

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74) Which of the following is a contribution that Galileo made to astronomy?
- A) He determined the size of Earth.
- B) He discovered epicycles.
- C) He developed the first successful heliocentric theory.
- D) He discovered four moons (or satellites) of Jupiter.

75) Galileo's observation of sunspots showed that _____.
- A) the Sun was not a flawless sphere
- B) Earth revolved around the Sun
- C) planets moved along elliptical orbits around the Sun
- D) the stars could change
- E) none of these choices is correct

76) Galileo's observation of the satellites of Jupiter showed that _____.
- A) there were objects that did not orbit Earth
- B) planets orbited the Sun
- C) the Moon was not a flawless sphere
- D) nothing orbited Earth
- E) none of these choices is correct

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Answer Key

Test name: Chapter 02

1) FALSE
2) TRUE
3) TRUE
4) FALSE
5) TRUE
6) FALSE
7) FALSE
8) TRUE
9) FALSE
10) TRUE
11) FALSE
12) TRUE
13) TRUE
14) TRUE
15) FALSE
16) TRUE
17) TRUE
18) FALSE
19) C
20) C
21) B
22) C
23) D
24) B
25) A
26) B
27) C
28) C
29) C
30) D
31) A
32) C
33) B
34) C
35) A
36) A
37) B

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38) B
39) D
40) C
41) A
42) C
43) A
44) A
45) C
46) D
47) B
48) D
49) A
50) C
51) D
52) A
53) A
54) A
55) C
56) C
57) A
58) D
59) B
60) A
61) D
62) C
63) D
64) B
65) C
66) A
67) C
68) A
69) B
70) C
71) C
72) B
73) C
74) D
75) A
76) A

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