

Jerusalem Science Contest 2020/21 - 5781 חדרון המדה הירושלמי

Astronomy

Test 2

Name: _____

Date: _____

Proctor for this Test: _____

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

- 1) The number of waves passing a point in one second is called the
 - A) energy.
 - B) wavelength.
 - C) frequency.
 - D) speed.

- 2) There are no x-ray telescopes on Earth because
 - A) they are too expensive to build.
 - B) they are too difficult to maintain.
 - C) x-rays don't penetrate Earth's atmosphere.
 - D) there are no astronomical objects that emit x-rays.

- 3) According to Maimonides - Rambam, upon receiving the New Moon eyewitness testimony....
 - A) it became unnecessary for the High Court to perform any astronomic New Moon calculations
 - B) the High Court would discard any previous astronomic computations and rely solely upon the testimony.
 - C) the High Court would compare the witness report to previously made astronomic computations.
 - D) the High Court would accompany the witnesses to a mountain and view the New Moon crescent together.

- 4) Most of the gas between stars has a temperature of less than a few hundred Kelvin. Due to this, whi of the electromagnetic spectrum is best for observing them?
 - A) X-rays
 - B) Infrared
 - C) Gamma rays
 - D) Ultraviolet

- 5) Which of the following statements best describes the relationship of the mitzvot (Jewish commands) to Kiddush Hachodesh and the observance of Shabbat.
- A) The fundamental element that permits eye witnesses of the New Moon to travel to Jerusalem on Shabbat is the High Court's responsibility to set the dates of Sukkot and Pesach
 - B) No New Moon eye witnesses are ever permitted to travel on Shabbat to bring their testimony to Jerusalem.
 - C) The fundamental element that permits eye witnesses of the New Moon to travel to Jerusalem on Shabbat is the High Court's responsibility to precisely calculate the appearance of the New Moon.
 - D) The eye witness testimony of the New Moon is a fundamental component of the mitzvah of Kiddush Hachodesh. Therefore, the eye witnesses may travel on Shabbat to Jerusalem to testify.
- 6) What was the major scientific deficiency of Copernicus's theory?
- A) It insisted that planets' orbits had to be perfectly circular and so had to invoke epicycles.
 - B) It could not explain the phases of Venus.
 - C) There was no deficiency.
 - D) It violated the religious teachings of the Catholic Church.
- 7) If the High Court calculates that the New Moon is not visible in the land of Israel, which of the following statements can be made with utmost certainty?
- A) It may be possible that the New Moon is visible in the lands west of Israel.
 - B) The New Moon will certainly be visible in the lands west of Israel
 - C) It may be possible that the New Moon is visible in the lands east of Israel.
 - D) The New Moon will certainly be visible in the lands east of Israel
- 8) Which type of electromagnetic radiation best reveals the features directly resulting from the pulsar (neutron star) at the heart of the Crab Nebula?
- A) X-rays
 - B) Infrared
 - C) Ultraviolet
 - D) Visible
- 9) If the High Court in Jerusalem made an erroneous declaration of the New Month, how would this error affect the observance of Passover?
- A) If the declaration was due to false testimony, Passover would have to be observed twice.
 - B) If the error was discovered prior to Passover, the beginning date of the holiday would be adjusted. Otherwise, the holiday would not be adjusted retroactively.
 - C) If the declaration was due to an erroneous calculation, Passover would have to be observed twice.
 - D) It wouldn't affect the observance of Passover because an erroneous declaration of the New Month by the High Court is still effective.

- 10) If the resolution of a telescope increases
- A) it will be able to better distinguish objects in the sky which appear to be close to each other.
 - B) it will better be able to see very feint objects.
 - C) it will better be able to split visible light into different colors.
 - D) it will have a better magnification power.
- 11) Which of the following statements most closely follow Maimonides - Rambam description of New Moon High Court procedure?
- A) If the High Court calculated that the New Moon was visible at the close of day 29, They would convene the entire 30th day waiting for witnesses to arrive.
 - B) The High Court would convene and wait for witnesses the entire 30th day, even if they calculated that the New Moon was not visible at the close of day 29.
 - C) If the High Court calculated that the New Moon was not visible at the close of day 29, they would convene on the 30th only if witnesses arrived and asked to be heard.
 - D) Because the it was never possible to see the New Moon crescent at the close of day 29, the High Court only convened on the 31st.
- 12) What do *adaptive optics* in telescopes correct for?
- A) The absorption of light by the atmosphere
 - B) "Light pollution" in cities
 - C) The "twinkling" of stars due to the atmosphere
 - D) Errors caused by imprecise optics
- 13) The object which today corresponds to the bright "new" star observed by astronomers in the year 1054 is called
- A) Polaris.
 - B) the Rosetta Nebula.
 - C) the Crab Nebula.
 - D) Alpha Centauri.
- 14) What did Galileo discover in relation to the planet Jupiter?
- A) Rings
 - B) Spots
 - C) Moons
 - D) Rotation about its axis
- 15) The Ptolemaic model used *epicycles* to explain
- A) the apparent retrograde motion of the planets.
 - B) differences in the apparent brightness of the planets at different times of year.
 - C) the movement of the Moon around the Earth.
 - D) the phases of Venus observed at different times of the year.

- 16) According to Galileo, which observation conclusively refuted the heliocentric model?
- A) The elliptical orbit of Venus
 - B) The retrograde motion of Venus
 - C) The fact that Venus only appears at maximum as a "fat crescent"
 - D) The fact that Venus shows a "full phase" where the entire face of the planet is visible
- 17) When an atom emits a photon of light
- A) an electron within the atom transitions from a higher to a lower energy level.
 - B) a proton within the atom transitions from a lower to a higher energy level.
 - C) an electron within the atom transitions from a lower to a higher energy level.
 - D) a neutron within the atom transitions from a lower to a higher energy level.
- 18) Why did ancient astronomers not observe *parallax* of nearby stars compared to more distant ones?
- A) Because the stars move relative to one another, which obscures the parallax.
 - B) Since the stars are so far away, even the closest ones have very small parallax.
 - C) Because the Earth orbits the Sun too slowly (i.e. only once a year) for it to be noticeable on a day-to-day basis.
 - D) Because Ptolemy's model is correct.
- 19) Radio telescopes have large dishes in order to
- A) decrease the probability that they will break down,
 - B) compensate for absorption of radiation by the atmosphere.
 - C) increase their magnification power.
 - D) better focus the long wavelength radio waves.
- 20) Which type of radiation passes through the Earth's atmosphere with virtually no absorption?
- A) Infrared
 - B) Gamma rays
 - C) Radio
 - D) Ultraviolet

Answer Key

Testname: JSC 5781 LEC 02 TEST SCIENCE AND JUDAICA

- 1) C
ID: USER-37
- 2) C
ID: at8c 3.2-23+
- 3) C
ID: USER-51
- 4) B
ID: USER-43
- 5) A
ID: USER-55
- 6) A
ID: USER-46
- 7) A
ID: USER-54
- 8) A
ID: USER-38
- 9) D
ID: USER-53
- 10) A
ID: USER-49
- 11) A
ID: USER-52
- 12) C
ID: USER-41
- 13) C
ID: USER-36
- 14) C
ID: USER-47
- 15) A
ID: USER-44
- 16) D
ID: USER-48
- 17) A
ID: USER-40
- 18) B
ID: USER-45
- 19) D
ID: USER-42
- 20) C
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