

Jerusalem Science Contest 2020/21 - 5781 חדרון המדה הירושלמי

Astronomy

Test 4

Name: \_\_\_\_\_

Date: \_\_\_\_\_

Proctor for this Test: \_\_\_\_\_

Form: \_\_\_\_\_

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

- 1) Scientists believe that there is an ocean of liquid water below the frozen surface of Jupiter's moon Europa, because
  - A) "geysers" of liquid water have been observed shooting out of the ice.
  - B) the surface is a vast network of lines which resemble pressure ridges on Earth's frozen polar ocean surfaces.
  - C) it has been observed water using radar.
  - D) Europa absorbs light characteristic of H<sub>2</sub>O in the infrared region of the spectrum.
  
- 2) If Jupiter's moon Europa turns out to have life forms on it, these are likely to resemble which terrestrial life forms?
  - A) Fossil invertebrates
  - B) Seaweed
  - C) Viruses
  - D) Extremophiles
  
- 3) Olympus Mons, the largest known volcano in the solar system, is a feature of which planet?
  - A) Venus
  - B) Neptune
  - C) Mars
  - D) Mercury
  
- 4) The Cassini and Huygens probes observed Saturn's moon Titan and found
  - A) An icy surface and lakes of methane and ethane.
  - B) solid ice with very few features.
  - C) rocks and no ice.
  - D) volcanoes spewing molten sulfur.
  
- 5) ) Saturn's cloud surface appears more uniform than Jupiter's because
  - A) the colorful layers are not visible due to Saturn's greater distance from the Sun,
  - B) it is made up of completely different gases than Jupiter's.
  - C) the outer cloud layers are thicker due to Saturn's lower gravity.
  - D) the colorful layers escaped due to Saturn's lower gravity.

- 6) The runoff channels are features on Mars, which were probably formed by
- A) glaciers.
  - B) catastrophic, but rare, flooding.
  - C) melting underground ice.
  - D) rainstorms.
- 7) The presence of a magnetic field around Mercury was a surprise to scientists on the *Mariner 10* team because
- A) Mercury is spinning so slowly that it was thought it could not generate one.
  - B) it's still too hot for its core to have differentiated.
  - C) Mercury lacks an iron core.
  - D) there is not enough magnetic material in the planetary interior.
- 8) Scarps are features on Mercury which were probably caused by
- A) plate tectonic activity.
  - B) cooling and shrinking of the crust.
  - C) bombardment by meteorites.
  - D) volcanos.
- 9) Ganymede is a moon of Jupiter, larger in size than the planet Mercury. However, it is not considered a planet since
- A) it does not have an atmosphere.
  - B) it orbits a body other than the Sun.
  - C) it has no volcanic activity.
  - D) it does not have a rounded shape.
- 10) Why are Saturn's rings so clearly visible?
- A) They reflect a lot of light coming from Saturn.
  - B) They are made up of small metallic objects roughly the size of cars and trucks.
  - C) The objects they contain are polished from numerous collisions with other objects.
  - D) They are made up of lots of icy particles which are very reflective.
- 11) The atmosphere of Jupiter consists of lighter-colored zones and darker belts. These are a result of
- A) the system of rings around the planet.
  - B) variations in the planet's gravitational field.
  - C) convective motion of alternately rising and sinking material.
  - D) ripples in Jupiter's magnetic field, which bring lighter and darker material to the upper atmosphere.

- 12) There is evidence of liquid water on Mars in the past. Scientists now believe that this water
- A) is in a layer of permafrost just below the surface.
  - B) is in clouds above the Martian surface.
  - C) is in shallow pools near the poles.
  - D) is in deep pools near the equator.
- 13) The volcanoes and molten interior of Jupiter's moon Io are thought to be caused by
- A) radioactive decay in Io's interior
  - B) solar radiation focused by Jupiter's gravity
  - C) gravitational tidal stresses from both Jupiter and Europa
  - D) Jupiter's magnetosphere and its charged particles
- 14) The atmospheres of Venus and Mars are thought to have evolved differently from that of Earth because
- A) they orbit at different distances from the Sun.
  - B) they are less massive than Earth.
  - C) they are slightly smaller than Earth.
  - D) they formed earlier than Earth.
- 15) Which discovery, in the early 2000's, called into question Pluto's official designation as a planet?
- A) Trans-neptunian Objects (TNO's) some of which are comparable in size to Pluto
  - B) The fact that Pluto's orbit is out of the plane of orbit of the other planets
  - C) The fact that Pluto's orbit is highly eccentric (more elliptical than other planets)
  - D) Pluto's moon Charon
- 16) Why was it important for the Sanhedrin to know if the new moon crescent could be seen after sunset?
- A) Such information helped the judges calculate the placement of the date line.
  - B) They would then know whether or not to set out the New Moon kiddush.
  - C) To establish a "qualifying day" for the declaration of the new month (Rosh Chodesh).
  - D) To establish the exact location of the Prime Meridian for the new month.
- 17) Adam, the first man, was watching the very first sunset with Chava as they sat alone on what would be known in the future as the Haifa beach. Chava said to him, "Shabbat Shalom. It's nice to be the only people in the Yishuv. We don't have to wear masks. When is Shabbat over?" What was Adam's reaction?
- A) He waited 18 hours and said to Chava, "Time to make havdala".
  - B) He waited until the Sun traveled 360 degrees and said to Chava, "This is where Sunday starts in the world".
  - C) He waited all night and half the next day. At mid day, he said to Chava, "Shabbat is over on the east edge of the Yishuv".
  - D) He said, "Shabbat Shalom. Beats me; I don't have a clue. Only God knows. Just enjoy the beach".

- 18) Rabbi Yehuda Halevy requires two points; one designated as the ultimate west of the West and one designated as the ultimate east of the East. Does not a date line require only one longitude that serves both functions?
- A) What Halevy means is that the two points are both located on one longitude. This is because you need a minimum of two points to draw one longitudinal date line.
  - B) Yes, it does. And, as a result, Halevy holds that Judaism does not consider a date line.
  - C) Not necessarily. The modern international date line changes longitudes between continents and islands.
  - D) No., it does not. Halevy requires one longitudinal date line, with the one point east of the date line and one point west of it. The distance between each point and the date line is "No date's land."
- 19) What is Yesod Olam's (Y.Y. ben Yosef) rationale for not setting Yerushalayim (Jerusalem) as the date line?
- A) He argues that the date line must be placed in the sea opposite Yerushalayim.
  - B) He believes that it is not logical to set a date line against world convention.
  - C) Setting Yerushalayim as the date line would have an absurd consequence.
  - D) If Judaism sets Yerushalayim as the date line, the world will put it elsewhere. But if Judaism sets it elsewhere, the world will place it through Yerushalayim, where it should be.
- 20) Yesod Olam (Y.Y. ben Yosef) made the following statement: "Knowing that Creation started with the beginning of daylight and traditional Judaism starts a day with nightfall, indicates that...". Please complete Yesod Olam's rationale.
- A) The dateline should, therefore be located at the first place in the Yishuv where dusk falls, similar to Jewish tradition.
  - B) The dateline should, therefore be located at the first place in the Yishuv where dawn breaks, similar to Creation.
  - C) Just as the Jewish day is set at nightfall, so, too, should the date line be located where night has fallen upon the entire Yishuv.
  - D) Just as the beginning of a Jewish day is set by Jewish consensus, so, too, the placement of the Jewish date line is set by Jewish consensus.

## Answer Key

Testname: JSC 5781 LEC 04 TEST SCIENCE AND JUDAICA

- 1) B  
ID: USER-68
- 2) D  
ID: USER-68
- 3) C  
ID: USER-68
- 4) A  
ID: USER-68
- 5) C  
ID: USER-68
- 6) B  
ID: USER-68
- 7) A  
ID: bgu7c 6-63+
- 8) B  
ID: bgu7c 6-48+
- 9) B  
ID: USER-65
- 10) D  
ID: USER-68
- 11) C  
ID: USER-68
- 12) A  
ID: bgu7c 6-64+
- 13) C  
ID: bgu7c 8-54+
- 14) A  
ID: USER-68
- 15) A  
ID: USER-67
- 16) C  
ID: USER-56
- 17) C  
ID: USER-57
- 18) C  
ID: USER-58
- 19) C  
ID: USER-59
- 20) D  
ID: USER-60

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