

**INVESTIGATION ON THE CURRENT STATUS OF ASTRONOMY AND SPACE SCIENCE KNOWLEDGE
AMONG RWANDESE STUDENTS**

Name of School:

District:.....

Names of the student:.....

Class level:

Option:.....

Date

Introduction:

The year 2009 was declared the International year of Astronomy by UNESCO. In Rwanda, a lot of activities will be organised in order to sensitize Rwandan citizens, especially science students on the importance of Astronomy in teaching and learning Science, especially physical sciences. The present questionnaire intends to investigate the current status of understanding in basics of astronomy and space science among Rwandese students. This investigation is also one of the tools of a research project being carried out in the framework of the International Year of Astronomy.

Instructions: -Choose the best answer and tick on the corresponding letter.

-If you think there is no best answer, write down your best opinion

1. What is Astronomy?

- [A] The study of Physics
- [B] The science of building space ships
- [C] The study of outer space
- [D] The study of Telescopes

2. Which of the following has the eight planets of our Solar System in the correct order?

- [A] Mercury, Jupiter, Earth, Saturn, Venus, Mars, Uranus, Neptune
- [B] Mercury, Venus, Earth, Mars, Saturn, Neptune, Uranus, Jupiter
- [C] Mercury, Mars, Earth, Venus, Jupiter, Saturn, Uranus, Neptune
- [D] Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, Neptune

3. Which planet is the biggest?

- [A] Jupiter
- [B] Uranus
- [C] Saturn
- [D] Mars

4. If you are standing in the path of a source of light that is moving toward you, the light you see will look _____ than it would ordinarily. The phenomenon is called _____

- [A] redder/absorption spectrum
- [B] bluer/Doppler effect
- [C] Brighter/transmission factor
- [D] darker/scattering effect

5. The following planet is much known because of its rings?

- [A] Jupiter
 - [B] Uranus
 - [C] Saturn
 - [D] Mars
6. Which of the following correspond to the name of a star in the sky?
- [A] Apollo
 - [B] Sirius
 - [C] Andromeda
 - [D] NASA
7. How can we learn about the temperature of a star?
- [A] By using a thermometer.
 - [B] By using stellar radiation panels
 - [C] By the colour of the star
 - [D] By asking the aliens (extraterrestrial) who live near the star
8. The path the planets follow across our sky is known as the
- [A] Planetary Path
 - [B] Ecliptic
 - [C] Universal Orbit
 - [D] Orbital Path
9. The first Astronomer to propose that the planets travelled in elliptical, and not in circular orbits was
- [A] Copernicus
 - [B] Ptolemy
 - [C] Kepler
 - [D] Galileo
10. Sunspots (**dark areas on the surface of the Sun**)
- [A] are cooler and therefore darker than the photosphere
 - [B] can be bigger than the Earth
 - [C] are related to the magnetic field of the Sun
 - [D] all of the above
11. Using his own telescope, the Italian astronomer Galileo Galilei discovered
- the moons of
- [A] Jupiter
 - [B] Saturn
 - [C] Mars
 - [D] Uranus
12. A black hole is formed from collapsed stars that are
- [A] more massive than our Sun
 - [B] less massive than our Sun
 - [C] It doesn't depend on mass
13. The surface temperature of the Sun is approximately
- [A] 1000 K
 - [B] 6000 K
 - [C] 10,000 K

14. The photons that make up radio waves travel at the same speed as the photons that make up visible light.
- [A] True
 - [B] False
 - [C] We don't know
15. The mass of an object that approaches the speed of light will
- [A] increase
 - [B] decrease
 - [C] remain the same
 - [D] none of the above
16. The electromagnetic spectrum can be expressed in terms of energy, wavelength, or frequency.
- [A] True
 - [B] False
17. Low energy photons are waves. High energy photons are particles.
- [A] True
 - [B] False
18. The universe was formed
- [A] About 5 million years ago
 - [B] Was created about 5 thousands years before Christ.
 - [C] The universe was existed forever
 - [D] About 13 billions years ago
19. A large assembly of stars together with gas, dust, and other materials that is held together by the forces of mutual gravitational attraction is called
- [A] a solar system
 - [B] a planetary system
 - [C] a galaxy
 - [D] the cosmos
20. The solar system belongs to :
- [A] Andromeda Galaxy
 - [B] Milky Way Galaxy
 - [C] Large Magelanic cloud
 - [D] Small Magelanic cloud
21. The following sky objects have already been visited by the man-made space shuttles
- [A] Mercury and moon
 - [B] Jupiter and Mars
 - [C] Moon and Mars
 - [D] Venus and Mars
22. The abundance of light elements in the universe and the presence of the cosmic microwave background radiation is good evidence for
- [A] the internal composition of the Sun
 - [B] the account of creation in Genesis
 - [C] the big bang theory

23. The distance From the sun to the Earth is between ?
- [A] 100 million Km and 150 million Km
 - [B] 400000 Km and 500000 Km
 - [C] 60 million Km and 80 Million Km
 - [D] 3000 Million Km and 3500 Million Km
24. Small bodies found inside the empty space in the solar system and moving around the sun can be either :
- [A] meteors
 - [B] asteroids
 - [C] comets
 - [D] All the above are correct
25. It is now known that more than 70% of the matter in the Universe is invisible
- i.e Dark matter
- [A] True
 - [B] False
 - [C] The dark matter doesn't exist
26. The sunlight takes about :
- [A] One second to reach the Earth
 - [B] 10 seconds to reach the Earth
 - [C] 8 minutes and 20 seconds to reach the Earth
 - [D] 3×10^8 seconds to reach the Earth
27. The branch of science that deals with the study of the structure and history of the entire universe is
- [A] Cosmology
 - [B] Astrophysics
 - [C] Astrology
 - [D] Astronomy
28. Synchrotron radiation is produced when electrons, moving near the speed of light, are accelerated
- [A] by their interaction with the solar wind
 - [B] to a critical velocity
 - [C] in spirals around a magnetic field
 - [D] in the direction of an X-ray telescope
29. What are stars made of ?
- [A] Light
 - [B] Hot Gas
 - [C] Rock
 - [D] Clouds
30. Galaxies are considered to be the largest structure in the universe.
- [A] True
 - [B] False

[C] We don't know

31. Why do stars appear too small?

[A] Because they are so far a way from the Earth

[B] Because they are closer to the Sun

[C] Because they are small than Earth

[D] I don't know

32. Heat generated by fusion in a star's core is carried outwards towards the surface by radiation and by convection. Convection is most like:

[A] the way heat from the Sun is transferred to the Earth

[B] the way the heat from a stove is transferred through a pot of water "

[C] the way heat in a radiator is transferred throughout a room

33. Under non-eclipse conditions, the part of the star that we see in visible light is the

[A] photosphere

[B] chromosphere

[C] corona

[D] All of the above

34. Objects that are _____ emit _____ radiation.

[A] round, all

[B] cooler, more

[C] vibrating, no

[D] hot, more energetic

35. Telescopes sensitive to infrared, ultraviolet, X-ray and gamma-ray wavelengths

are placed in space because:

[A] The Earth's atmosphere mixes the signals of the different wavelengths together.

[B] It is necessary to be above the Earth's atmosphere, which absorbs light at these

wavelengths, to make such observations.

[C] Space-based telescopes are less expensive to build and operate.

[D] There is no room on the ground.

36. Which instrument is most used for sky object observation?

[A] Spectroscope

[B] Telescope

[C] Radar

[D] Microscope

37. The net effect of the three-step process that produces energy in the Sun is called

[A] proton burning

[B] deuterium burning

[C] helium burning

[D] hydrogen burning

38. Gas in space emits radio waves.

- [A] True
- [B] False
- [C] We don't know

39. Gamma-rays are the most energetic form of electromagnetic radiation.

- [A] True
- [B] False
- [C] We don't know

40. Which star is closer to solar system ?

- [A] Sirius
- [B] Sharon
- [C] Alpha Centauri
- [D] Mariner I

41. _____ is the most important property of an image to a scientist.

- [A] Size
- [B] Resolution
- [C] Brightness
- [D] All of the above

42. Which of the following is correct in order of lowest to highest frequency?

- [A] X-rays, Visible Light, Microwave
- [B] Ultraviolet, Visible Light, Gamma-rays
- [C] Microwave, Visible Light, Gamma-rays

43. State usefulness of artificial satellites

- [A] For communication
- [B] For scientific research
- [C] For military purposes
- [D] All are correct

44. In the well known Einstein's equation, $E=mc^2$, the letter "m" stands for

- [A] meters
- [B] molecules
- [C] mass
- [D] movement

45. Because each element has a unique spectrum, we can use spectra from objects such as stars to tell us

- [A] how old they are
- [B] how far away they are
- [C] what the star is made of
- [D] how big they are

46. Fourier analysis presumes that every function can be expressed as an infinite series of

- [A] random periodic functions
- [B] sine waves
- [C] timing measurements
- [D] chaotic systems