International Astronomy and Astrophysics Competition
Final Round

# Final Round Exam 2024

The final round exam was given in the form of an online exam.
Each participant was given a subset of 20 questions in random order.
This paper version is only available for training purposes.

**Question 1 :** Which one of these stars can be seen only in the Southern Hemisphere?

(A) Antares (B) Arcturus

(C) Alpha Centauri (D) Altair

---

**Question 2 :** Which one of these constellations can be seen only in the Southern Hemisphere?

(A) Cepheus (B) Cassiopeia (C) Cygnus (D) Crux

---

**Question 3 :** What kind of astronomical object is the **Large Magellanic Cloud**?

(A) Constellation (B) Dwarf Galaxy (C) Nebula (D) Star Cluster

---

**Question 4 :** How many stars are there in the Milky Way?

(A) 10 - 100 billion (B) 100 - 400 billion

(C) 400 - 900 billion (D) 900 - 1200 billion

---

**Question 5 :** On Earth's surface, objects fall with a gravitational acceleration of approximately ...

(A) 9.8 $m/s^2$ (B) 11.9 $m/s^2$ (C) 19.5 $m/s^2$ (D) 32.2 $m/s^2$

---

**Question 6 :** The **cosmic microwave background** can be detected using a ...

(A) x-ray telescope (B) optical telescope

(C) infrared telescope (D) radio telescope

---

**Question 7 :** The rotational speed at Earth's equator is about 1,600 km/h. What is the rotational speed at Earth's poles?

(A) 0 km/h (B) 800 km/h (C) 1,131 km/h (D) 1,600 km/h

---

**Question 8 :** Which latitude is best suited for a rocket launch?

(A) 5°N (B) 15°S (C) 45°N (D) 90°S

---

**Question 9 :** The altitude of the International Space Station (ISS) is around ...

(A) 250 km (B) 380 km (C) 410 km (D) 520 km

---

**Question 10 :** The ISS descends over time primarily due to ...

(A) changes in Earth's rotational speed. (B) pressure from the solar wind.

(C) gravitational pull from the Moon. (D) collision with atmospheric particles.

---

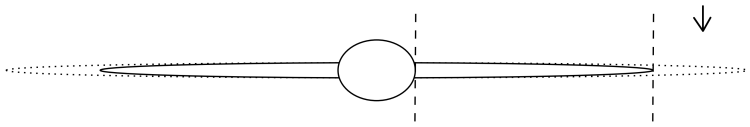
**Question 11 :** Space is often considered to start at an altitude of ...

(A) 50 km above ground (B) 100 km above ground

(C) 150 km above ground (D) 200 km above ground

---

**Question 12 :** What is the name of the region marked in the horizontal Milky Way drawing below?

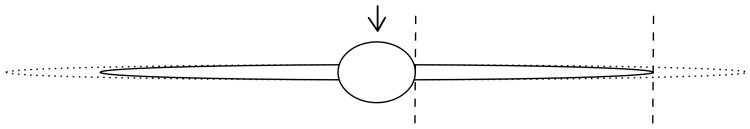


(A) galactic bulge (B) galactic disk

(C) galactic halo (D) galactic continuum

---

**Question 13 :** What is the name of the region marked in the horizontal Milky Way drawing below?



(A) galactic bulge (B) galactic disk

(C) galactic halo (D) galactic continuum

---

**Question 14 : Einstein rings** are caused by ...

(A) interference of light.

(B) magnetic field distortion.

(C) gravitational lensing.

(D) light scattering from interstellar dust.

---

**Question 15 :** What is the **initial mass function (IMF)** in astronomy?

(A) frequency of star formation events in a galaxy

(B) spatial distribution of stars in a star cluster

(C) distribution of star masses during formation

(D) chemical composition of newly formed stars

---

**Question 16 :** What is a **spectral energy distribution (SED)** plot in astronomy?

(A) plot of energy versus wavelength

(B) plot of energy versus distance

(C) plot of energy versus density

(D) plot of energy versus time

---

**Question 17 : Io** is a moon of the planet ...

(A) Venus (B) Jupiter (C) Saturn (D) Uranus

---

**Question 18 :** Which spacecraft orbits currently around Jupiter?

(A) Voyager (B) Cassini (C) New Horizons (D) Juno

---

**Question 19 :** How do volcanoes at the poles of the moon Io differ from volcanoes at the equator?

(A) polar volcanoes are less energetic

(B) polar volcanoes are less densely distributed

(C) polar volcanoes are more energetic

(D) polar volcanoes are more densely distributed

---

**Question 20 :** How many volcanic hot spots were observable on the surface of the moon Io between 2017 and 2022?

(A) 26 (B) 56 (C) 136 (D) 266

---

**Question 21 :** Which mechanism causes volcanic activity on the moon Io?

(A) solar radiation heat absorption
(B) impact from meteor showers
(C) tidally induced internal heating
(D) mantle convection heat transfer

---

**Question 22 :** How many people have stepped on the moon as of 2024?

(A) 8 (B) 12 (C) 22 (D) 32

---

**Question 23 :** Which one of these planets is never visible at midnight?

(A) Venus (B) Mars (C) Jupiter (D) Uranus

---

**Question 24 : Schmidt, Cassegrain, and Galilean** are names for famous ...

(A) spacecraft types
(B) comet types
(C) telescope types
(D) wavelength types

---

**Question 25 :** Most stars are cooler than the Sun and emit most of their energy as ...

(A) ultraviolet light
(B) visible light
(C) radio waves
(D) infrared light

---

**Question 26 :** Astronomers use **Cepheid stars** as a measurement for ...

(A) velocity
(B) distance
(C) diameter
(D) spectral composition

---