# ST. JOSEPH'S UNIVERSITY, BENGALURU -27 <br> PHYSICS OPEN ELECTIVE- I SEMESTER <br> SEMESTER EXAMINATION: OCTOBER 2022 <br> (Examination conducted in December 2022) <br> PHOE 01 - ASTRONOMY - THE EVOLVING UNIVERSE 

Time: 2 Hour<br>Max Marks: 50<br>This paper contains 4 printed pages and 3 parts

## PART A

Answer ALL the questions. Each question carries 1 mark.
$25 \times 1=25$

1. In 1989, the Galileo spacecraft was launched to study the orbit of which planet?
a. Mars
b. Jupiter
c. Neptune
d. Saturn
2. The Scientists who study stars and planets are known as
a. Astrologers
b. Astronomers
c. Anthropologists
d. Chemists
3. Our Solar system belongs to:
a. Elliptical Galaxy
b. Spiral galaxy
c. Irregular galaxy
d. none of these
4. A star like body with a long tail is called:
a. Comet
b. meteor
c. meteorite
d. none of these
5. The branch of science that studies the heavenly bodies of the universe is called:
a. Astrology
b. Astronomy
c. cosmogony d. anatomy
6. The planet farthest from the sun is:
a. Neptune
b. Pluto
c. Saturn
d. Uranus
7. The streak of light caused by a heavenly body burning completely while moving through the atmosphere is called:
a. Comet
b. Meteor
c. Asteroid
d. meteorite
8. The rocky objects that orbit the Sun between the inner and outer planets are:
a. Comets
b. meteors
c. asteroids
d. moons
9. Ocean tides are caused by the gravitational pull of:
a. The moon
b. The sun
c. both the sun and the moon
d. none of these
10. Sunspots are
a. Hotter regions on the surface of the sun
b. related to the sun's electric field
c. A hot, rarefied gas surrounding the sun
d. Places where the magnetic field lines leave or enter the sun's surface.
11. A white dwarf is typically the size of
a. The sun
b. Mercury's orbit
c. the earth's orbit
d. the earth
12. Most of the stars on the H-R diagram belong to which group?
a. Red giant
b. Super giants
c. main sequence
d. white dwarf
13. The diameter of our galaxy is closest to
a. 100 light years
b. 100,000 light years
c. 10,000 light years
d. 10,000,000 light years
14. The largest stars are found in which corner of the H-R diagram?
a. Lower left
b. upper left
d. lower right
d. upper right
15. If two stars have the same luminosity, the cooler star must have a $\qquad$ -
a. Larger diameter
b. bluer colour
c. smaller radius
d. larger doppler effect
16. The spectral lines of a star are observed to be shifted toward smaller wavelengths. This shows that
a. The star is rather cool
b. the star is approaching us
c. The star is receding from us
d. the star is very hot.
17. A continuous spectrum is formed by $\qquad$ _
a. A hot frying pan
b. a glowing steel ingot in a blast furnace
c. The photosphere of sun
d. all of the above options.
18. The discovery that planets move in elliptical orbits with the sun at the focus was made by $\qquad$
a. Halley
b. Tycho Brahe
c. Kepler
d. Galileo
19. The correct arrangement of light at different wavelengths, in order from smallest to largest wavelength, is:
a. Radio-infrared-visible-x rays
b. Infrared-ultraviolet - microwaves-visible light
c. Gamma rays $-x$ rays - ultraviolet - visible light
d. Radio waves - visible - infrared - x rays.
20. The particles found in the nucleus of an atom are $\qquad$
a. Electrons and protons
b. Protons and neutrons
c. Electrons and photons
d. photons and neutrons
21. What sort of light does the Chanda telescope measure?
a. Infrared
b. X-rays
c. Ultraviolet
d. Gamma rays
22. The largest telescopes used for observation in the visible region of the spectrum are
a. Refracting telescopes
b. Radio telescopes
c. Reflecting telescopes
d. telescopes that have chromatic aberrations
23. The speed of light in a vacuum is
a. $300,000 \mathrm{~km} / \mathrm{s}$
b. $30,000 \mathrm{~km} / \mathrm{s}$
c. $3,000,000 \mathrm{~km} / \mathrm{s}$
d. $3000 \mathrm{~km} / \mathrm{s}$
24. Orbits of comets are
a. Elliptical
b. Aero-centric
c. Geocentric
d. Galactocentric
25. What type of Galaxy is the Milky way?
a. Elliptical galaxy
b. Irregular Galaxy
c. Barred spiral galaxy
d. Spiral galaxy without bars.

## PART B

Answer any 3 questions. Each question carries 5 marks.
26. Match the following and write a short note on the moon and the sun.

| i. | Shooting star | a. | Ursa Major |
| :--- | :--- | :--- | :--- |
| ii. | Constellation | b. | Milky Way |
| iii. | Brightest planet | c. | Moon |
| iv. | Artificial satellite | d. | Halley |
| v. | Galaxy | e. | Meteors |
| vi. | Periodic comet | f. | Sun |
| vii. | Natural satellite | g. | Venus |
| viii. | Star | h. | INSAT |

27. With neat labeled diagrams differentiate the working of a refracting and reflecting telescope.
28. Briefly explain the need for space-based observations.
29. What is an eclipse? Draw a neat diagram for the formation of the solar eclipse.
30. Define the following terms
a. Constellation
b. Galaxies
c. Stars
d. Planets

PART C
31. This is a compulsory question that carries 10 marks. Solve the below astronomy crossword puzzle. The clues are given on the next page.
$1 \times 10=10$


Across
2 A small body that orbits the Sun but cannot be classified as a dwarf planet or a planet.
3 A great star-like celestial object that emits massive amounts of energy.
4 A star that has collapsed in on itself and has so much gravity that nothing can escape from it once it ha come close enough.
5 A body that orbits a planet.
9 A body that orbits a star that is not our Sun, has a clear orbit, and is round.
10 A body that orbits a star, is round and has a clear orbit.

## Down

1 A body that orbits the Sun, is round but does not have a clear orbit.
6 A small, icy body that heats up and leavs a trail of gas when close enough to the sun.
7 A large collection of stars, most likely with a supermassive black hole in the center.
8 A ball of gas where inside the core nuclear neactions are constantly occuring.

