



ST. JOSEPH'S UNIVERSITY, BENGALURU -27
Physics open elective – I SEMESTER
SEMESTER EXAMINATION: October 2023
(Examination conducted in December 2023)
PH OE 1: Astronomy- The Evolving Universe
(For current batch students only)

Registration Number:

Date & session:

Time: 2 hours

Max marks: 60

This paper contains 4 printed pages and 2 parts.

Part A

Answer any four questions. Each question carries 10 marks.

4x10=40

1. Draw a celestial sphere and label the following.

- i. Earth ii. north and south poles. iii. North and south celestial poles.
iv. Celestial equator. v. 0h circle vi. East arrow vii. Ecliptic
viii. A star with RA 1 h and Dec -25°

2. Using the table given below match the items in column A with their corresponding description in column B. Arrange column A in the order of increasing energy.

Column A	Column B
a. Radio waves	i. Causes sunburn and is often used in sterilization processes.
b. X-rays	ii. Used for cooking and certain wireless communication.
c. VIBGYOR	iii. Used in medical imaging to see inside the body.
d. Gamma rays	iv. Commonly emitted by heated objects and used in thermal imaging.
e. Ultraviolet (UV) radiation	v. Used for wireless communication, including AM and FM
f. Infrared radiation	vi. Extremely high-energy radiation often associated with nuclear processes.
g. Microwaves	vii. The part of the spectrum visible to the human eye.

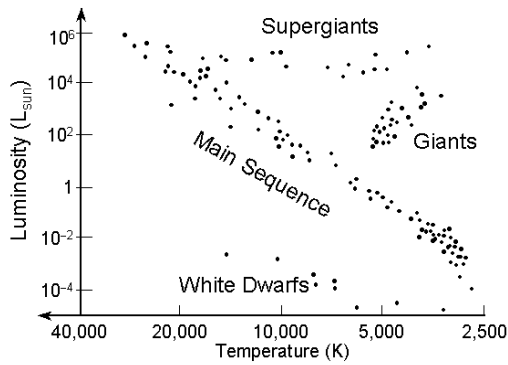
3. Solve the 10 riddles given below.

- i. I'm the smallest particle, I'm a building block of matter, what am I?
ii. I'm a celestial body, glowing in the night, I'm not a star but reflect sunlight with all my might. What am I?
iii. I'm a phenomenon, when the moon hides from view, obscuring the sun, creating a twilight-like hue. What am I?
iv. I'm a space telescope, known for my deep-field view, I've captured galaxies, stars, and nebulae in the cosmic brew. Who am I?
v. I'm a dwarf planet, once known as the ninth, my eccentric orbit takes me far from the solar light. What am I?
vi. I'm a spacecraft that explored the gas giants of our solar system, named after a famous astronomer, my missions had no schism. Who am I?
vii. I'm a planet with rings, but I'm not alone, among my companions, my beauty is known. Who am I?

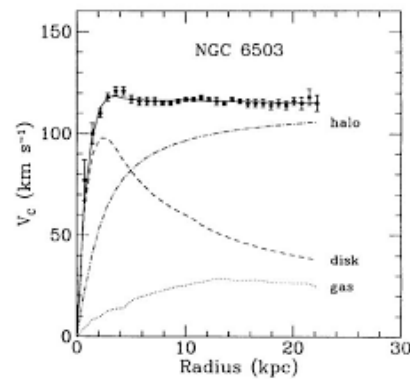
- viii. I'm a group of stars, forming a recognizable shape, In the night sky, my constellation is easy to trace. What am I?
- ix. I'm a red planet, the fourth from the sun, my rusty surface is where explorations begun. Who am I?
- x. I'm the closest star to our planet so dear, I provide light and warmth, year after year. What am I?

4. Identify the topic associated with each of the diagrams given below.

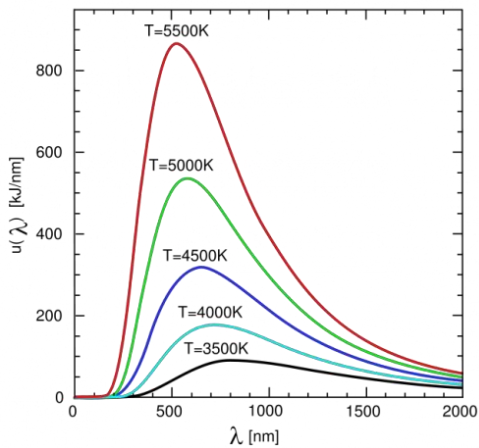
a.



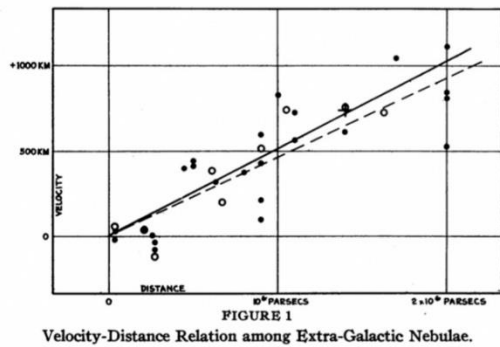
b.



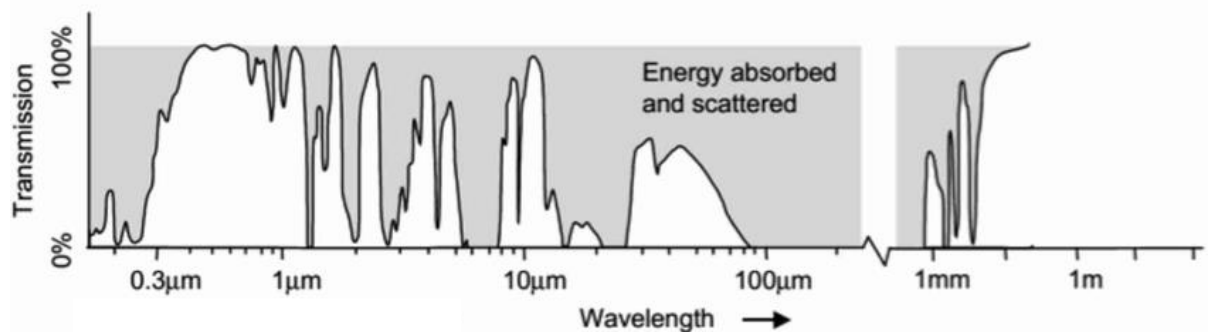
c.



d.



e.



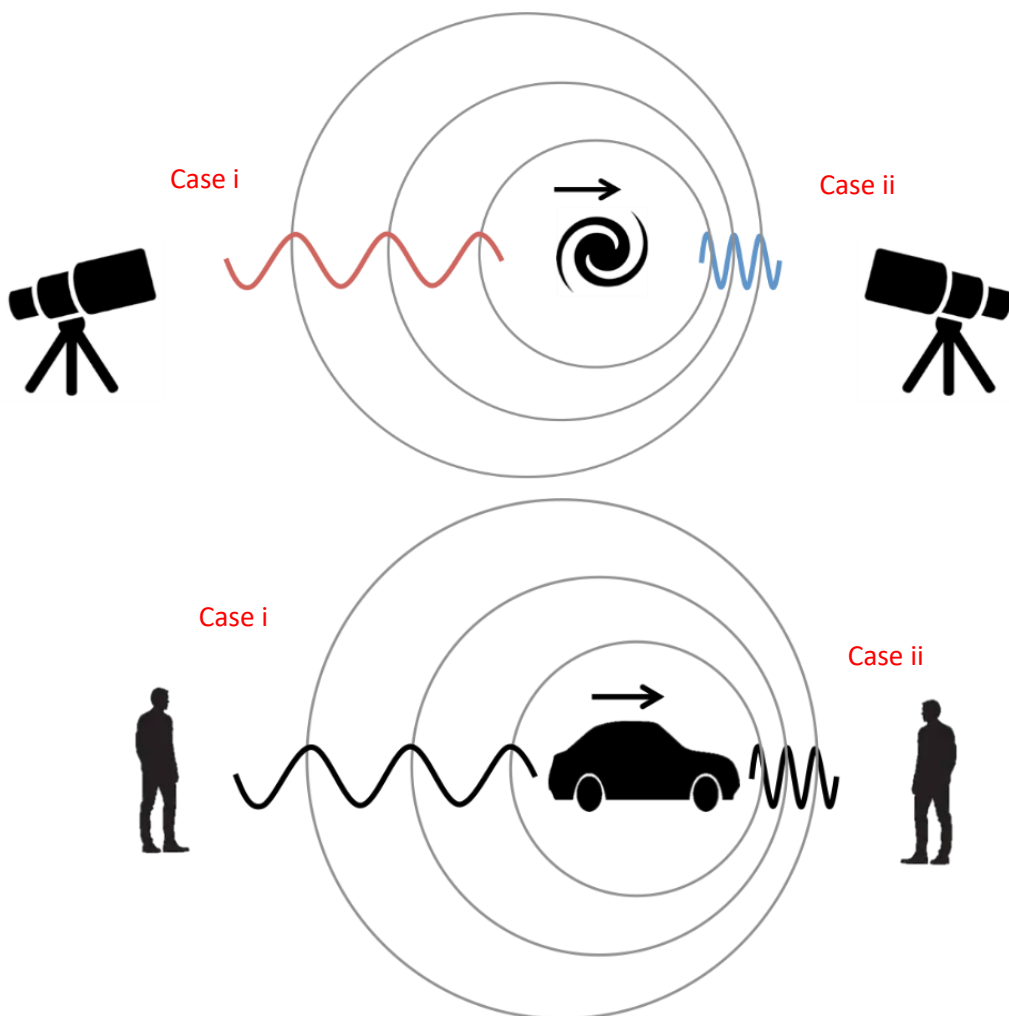
5. Represent the following by a neat labelled sketch.
- Absorption spectrum
 - Emission spectrum
 - Dispersion of light
 - Milky Way galaxy
 - Refracting telescope.

Part B

Answer any four questions. Each question carries 5 marks.

4x5=20

6. With a neat diagram briefly explain the total solar eclipse.
 7. Explain in one or two sentences the below diagrams. Mention their commonalities and differences.



8. Give a schematic of Hubble's tuning fork diagram for the classification of galaxies.
 9. Draw a Newtonian reflector and label the parts.

10. Explain the behaviour of light in each of the five blocks given below.

