U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

Autonomous Institute Affiliated to VTU

May / June 2025 Semester End Main Examinations

Programme: B.E. **Semester: VIII**

Branch: Institutional Elective **Duration: 3 hrs.**

Course Code: 24PY8OEAPS **Max Marks: 100**

Course: Astrophysics and Space Science

Instructions: 1. Answer any FIVE full questions, choosing one full question from each module.

2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			CO	***PO***	**Marks**
		MODULE - I			
1	a)	Discus the Ptolemy's astronomical work which explains the geocentric model of the universe.	CO1	PO1	**10**
	b)	Define the terms astronomical Module, light year and parsec. Write their relation.	CO1	PO1	**5**
	c)	The star Betelgeuse has a parallax angle of 7.7×10^{-3} arc-seconds. Calculate its distance in meters.	CO1	PO1 PO2	**5**
		OR			
2	a)	Discuss the ecliptic and galactic coordinate systems with neat sketches.	CO1	PO1	**10**
	b)	Mention and explain in detail the types of time systems.	CO1	PO1	**10**
		MODULE - II			
3	a)	What are absolute magnitude and distance modulus? Obtain the relation between them.	CO1	PO1	**10**
	b)	Explain in brief the H-R diagram with neat sketch.	CO1	PO1	**5**
	c)	The apparent magnitude of the Sun is -26.81 and that of the star Sirius is -1.47. Which one of them is brighter and by how much?	CO1	PO1 PO2	**5**
		OR			
4	a)	Mention the methods of luminosity measurement. With a neat sketch of a photoelectric photometer, illustrate the photoelectric method of luminosity measurement.	CO1	PO1	**10**
	b)	Elucidate in detail the life cycle of stars from their formation to their eventual end.	CO1	PO1	**10**

			MODULE - III			
	5	a)	Discuss the structure of the Sun, including the interior and atmospheric layers.	CO1	PO1	**10**
		b)	Explain Kepler's laws of planetary motion with their significance.	CO1	PO1	**10**
			OR			
	6	a)	What is solar eclipse? With necessary diagrams discuss the types and condition for occurrence of solar eclipses.	CO1	PO1	**10**
		b)	Briefly explain the role of telescopes in the exploration of solar system. Describe the types, key discoveries and contributions from telescopic observations. Also mention the challenges in solar system exploration via telescopes.	CO1	PO1	**10**
			MODULE - IV			
	7	a)	With necessary diagram explain the structure of earth's atmosphere.	CO1	PO1	**10**
		b)	With necessary diagram explain the origin of earth's magnetic field and its key role in protecting the planet from space weather. Also describe the terms magnetosphere, magnetic poles and magnetic field strength.	CO1	PO1	**10**
			OR			
	8	a)	Describe ionosphere. Discuss its significance in communication and protection of planet from solar radiation.	CO1	PO1	**10**
		b)	Discuss interplanetary space and its key features	CO1	PO1	**10**
			MODULE - V			
	9	a)	Mention the characteristics of the reflecting telescopes. With neat schematic of the optical systems explain the different focus of the reflecting telescopes.	CO1	PO1	**10**
		b)	Explain the role of active and adaptive optics in modern astronomical telescopes.	CO1	PO1	**10**
			OR			
	10	a)	Describe the equatorial and altazimuth mountings of telescopes with necessary diagrams.	CO1	PO1	**10**
		b)	What are the advantages and challenges in using X-ray telescopes? Explain in detail with an example.	CO1	PO1	**10**

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