STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 600 086.
(For candidates admitted during the academic year 2023 – 2024 & thereafter)

M.Sc. DEGREE EXAMINATION NOVEMBER 2024
PHYSICS
FIRST SEMESTER

COURSE   : ELECTIVE
PAPER   : ASTROPHYSICS
SUBJECT CODE : 23PH/PE/AP15
TIME   : 3 HOURS   **MAX. MARKS : 100**

Q. No.	SECTION A Answer ALL the questions: (10 x 3 = 30 marks)	CO	KL
1.	Define Altazimuth coordinate system.	CO1	K1
2.	What is stellar parallax and mention its limitations?	CO1	K1
3.	How is the temperature of a star measured?	CO1	K1
4.	Relate luminosity of a star with its mass.	CO1	K2
5.	Outline the ideas of polytropic model.	CO2	K2
6.	Interpret Eddington's standard model briefly.	CO2	K2
7.	State the virial theorem.	CO2	K2
8.	What does causes the depletion of hydrogen in a stars?	CO2	K3
9.	Construct the theory on thermonuclear reactions.	CO3	K3
10.	What is helioseismology and what does it tell us about the Sun?	CO3	K3
Q. No.	SECTION B (30 marks)	CO	KL
	PART A Answer any TWO questions: (2 x 5 = 10 marks)		
11.	Develop the method to calculate luminosity distance	CO3	K3
12.	Construct a model to measure stellar radii	CO3	K3
13.	Build Russel - Vogt theorem for the determination of structure of a star.	CO3	K3
	PART B Answer any FOUR questions: (4 x 5 = 20 marks)	CO	KL
14.	Compare Ecliptic and Galactic systems	CO4	K4
15.	Classify the stars according to Spectral and luminosity.	CO4	K4
16.	Evaluate the evolution of stars near the main sequence.	CO4	K4
17.	Compare Carbon-Nitrogen cycle and Proton-Proton cycle.	CO4	K4
18.	Give the importance on the problems of nucleosynthesis.	CO4	K4
Q. No.	SECTION C Answer the following: (2 x 20 = 40 marks)	CO	KL
19.	i) Explain trigonometric, cluster and secular parallaxes.	CO5	K5

	(OR)		
	ii) What are Binary stars? Describe the following, a) visualizing binaries b) spectroscopic investigation on binaries and c) eclipsing binaries.	**CO5**	**K5**
20.	**i**) Explain, a) Homologous model for main sequence stars and b) Schwarzchild's model for real stars.	**CO5**	**K5**
	(OR)		
	ii) a) Evaluate Schoenberg – Chandrasekhar limit of an isothermal core. b) Explain Star formation – Jean's criterion.	**CO5**	**K5**

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