STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086
(For candidates admitted from the academic year 2004-05 & thereafter)

SUBJECT CODE : MT/AO/FA43

B. Sc. DEGREE EXAMINATION, APRIL 2007
BRANCH I - MATHEMATICS
FOURTH SEMESTER

COURSE : ALLIED OPTIONAL
PAPER : FUNDAMENTALS OF ASTRONOMY
TIME : 3 HOURS **MAX. MARKS : 100**

SECTION – A

ANSWER ALL QUESTIONS : (10 x 2 = 20)

1. Define ecliptic and obliquity.
2. Define latitude of any place.
3. Define dip of the horizon.
4. Define morning star.
5. State Kepler's laws of planetary motion.
6. Define perigee and apogee.
7. Define conjunction and apposition of the moon.
8. What are ecliptic limits ?
9. State Bode's law.
10. What is a double star ?

SECTION – B

ANSWER ANY EIGHT QUESTIONS (8 x 5 = 40)

11. Explain horizontal system of coordinates to fix a star. (with diagram)
12. Explain with diagram, difference zones of earth's surface.
13. Define circumpolar star and find the condition for any star to be circumpolar.
14. Prove with usual notations $t = \alpha \pm h$.
15. Find the sidereal time at Greenwich corresponding to mean time $10^h13^m40^s$ a.m. on a given date, give that the sidereal time of mean midnight was $5^h15^m42^s$.
16. Define sidereal month and synodic month of the moon and find the rotation between them.
17. Compare solar and lunar eclipses.
18. Write a note on seasons.
19. Prove that, of any two planet, the inner planet moves faster than the outer planet.
20. Explain surface structure of the sun.

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SECTION – C

ANSWER ANY FOUR QUESTIONS (4x 10 = 40)

21. Prove that the hour angle and azimuth of a star of rising or setting are given by

$\cosh = -\tan\varphi \tan\delta$

$\cos A = \sin\delta \sec\varphi$

22. Trace the changes in the length of the day and night for Chennai latitude $\varphi = 13.4$ N.

23. Derive Newton's deduction from Kepler.

24. Trace the changes in the phase of the moon in one lunation.

25. Find the maximum number of eclipses in a year.

26. Write notes on Three

a) Refraction b) Twilight c) Calendar d) Asteroid