

**STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086**  
**(For candidates admitted from the academic year 2015–16)**

**SUBJECT CODE: 15MT/ME/ES55**

**B. Sc. DEGREE EXAMINATION, APRIL 2018**  
**BRANCH I – MATHEMATICS**  
**SIXTH SEMESTER**

**COURSE : MAJOR ELECTIVE**  
**PAPER : ELEMENTS OF SPACE SCIENCE**  
**TIME : 3 HOURS**

**MAX. MARKS: 100**

**SECTION-A**

**ANSWER ALL QUESTIONS:**

**10 X 2 = 20**

1. Define great circle and small circle.
2. State cotangent formula.
3. Write down the coordinates of the ecliptic system of coordinates.
4. Name the secondaries of horizon and equator.
5. Define dawn and dusk.
6. Define dip of the horizon.
7. Give the rule to convert sidereal time into mean solar time.
8. How to calculate Indian Standard Time?
9. Mention the solar ecliptic limits.
10. What is meant by eclipse seasons?

**SECTION-B**

**ANSWER ANY FIVE QUESTIONS:**

**5 X 8 = 40**

11. Find the relation between Right Ascension and longitude of the sun.
12. Find the changes in R.A and declination of a body due to geocentric parallax.
13. Explain the different types of Aberration.
14. Find the sidereal time at Greenwich corresponding to mean time 8h.12m.45s on a given date, given that the mean time of sidereal noon was 6h.47m.40s.
15. Find the longitude of the sun on any day.
16. Find the mass of a planet.
17. Find the minimum number of eclipses that can occur in a year.

**SECTION-C**

**ANSWER ANY TWO QUESTIONS:**

**2 X20 = 40**

18. (a) Explain with neat diagram the different system of celestial coordinates.

(b) Find the hour angle of a body at rising.

(10 + 10)

19. (a) Find the duration of twilight.

(b) Find the mean time corresponding to 12h.6m.37s sidereal time on

May 4 , 1940, given that mean time at sidereal noon was 9h.11m.35s.

(12 + 8)

20. Explain the direct and retrograde motions of planets.

