



**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034**

**B.Sc. DEGREE EXAMINATION – MATHEMATICS**

THIRD SEMESTER – NOVEMBER 2011

**MT 3502/MT 5503 - ASTRONOMY**

Date : 03-11-2011  
Time : 9:00 - 12:00

Dept. No.

Max. : 100 Marks

**PART - A**

**ANSWER ALL QUESTIONS**

**(10 X 2 = 20)**

1. What is a spherical triangle? Give any two properties of spherical triangles.
2. Define morning star and evening star.
3. What is the value of constants A and B in Cassini's formula for refraction.
4. Give the use of gnomon.
5. State Kepler's laws of planetary motion.
6. What are the different kinds of years?
7. Define an umbra.
8. What is harvest moon?
9. How many satellites do the planets Jupiter, Saturn and Neptune have?
10. What are the chief elements present in sun?

**PART - B**

**ANSWER ANY FIVE QUESTIONS.**

**EACH QUESTION CARRIES EIGHT MARKS**

**(5 X 8 = 40)**

11. Write notes on the ecliptic system of coordinates to find the position of any body in the celestial sphere.
12. Trace the variations in the duration of day and night during a year for a place of latitude 18° N.
13. What are astronomical seasons? Calculate their lengths.
14. Write a note on Julian Calendar.
15. Write a note on constellations.
16. Describe the successive phases of moon with a neat diagram.
17. Find the maximum and minimum number of eclipses in a year.
18. Calculate the eccentricity of earth's orbit around sun.

**Part - C**

**ANSWER ANY TWO QUESTIONS. (2 X 20 = 40)**

19. (A) Define twilight and derive an expression to find the duration of twilight.  
(b) Explain the different zones of earth with a neat diagram.
20. (a) Explain any one astronomical instrument with a neat diagram.  
(b) Derive Cassini's formula.
21. (a) Derive an expression for equation of time and prove that it vanishes four times in a year.  
(b) Write a note on surface structure of moon.
22. (a) Derive Kepler's equation.  
(b) Explain how solar and lunar eclipses are caused.

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