LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – MATHEMATICS

THIRD SEMESTER – APRIL 2010

MT 3502/MT 5503 - ASTRONOMY

Date & Time: 26/04/2010 / 1:00 - 4:00   Dept. No.   Max. : 100 Marks

PART - A

Answer ALL questions   **(10 x 2 = 20 marks)**

1. State cotangent formula.
2. Define sidereal day.
3. State the laws of refraction.
4. What is the effect of heliocentric parallax on the position of a star?
5. What is anomalistic year? Give its duration.
6. Define morning and evening. How are they related to equation of time?
7. How is age of moon calculated?
8. Explain what is meant by umbra and penumbra.
9. What is direct and retrograde motion of planets?
10. What are comets? How are they different from planets?

PART – B

Answer any FIVE questions. Each question carries EIGHT marks   **(5 x 8 = 40 marks)**

11. Describe the ecliptic system of coordinates with a neat diagram. Give the advantages and disadvantages of this system.
12. Find the effect of parallax on latitude and longitude of a star.
13. What are astronomical seasons? Calculate their lengths.
14. Define perigee and apogee. Write a note on longitude of perigee.
15. Define sidereal and synodic month of moon and derive a relation between them.
16. Find the maximum and minimum number of eclipses in a year.
17. Write a note on constellations of stars.
18. Trace the changes in the coordinates of sun in the course of a year.

(P.T.O.)

PART - C

Answer any two questions   **(2 x 20 = 40 marks)**

19. a) Define twilight. Derive an expression to find the duration of twilight.

    b) Explain the different zones of earth with a neat diagram.

20. a) Derive a tangent formula for refraction. How do you find the value of coefficient of refraction?

    b) Explain sextant with a neat diagram.

21. a) Derive an expression for equation of time. Prove that it vanishes four times in a year.

    b) Derive Kepler's equation.

22. a) Derive an expression for different phases of moon.

    b) Discuss the different phases with a neat diagram using the formula.

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