

LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

B.Sc. DEGREE EXAMINATION – MATHEMATICS

THIRD SEMESTER – NOVEMBER 2015

MT 3502/MT 5503 - ASTRONOMY

Date : 12/09/2015
Time : 01:00-04:00

Dept. No.

Max. : 100 Marks

PART – A

Answer ALL questions

(10 x 2 = 20 marks)

1. Write down the formula for spherical triangle.
2. Define visible and invisible hemispheres.
3. Define Astronomical Refraction.
4. Define aberration.
5. Define sidereal year.
6. State Kepler's laws of planetary motion.
7. Define age of the moon.
8. What are ecliptic limits?
9. What are asteroids?
10. Write down any four constellations.

PART – B

Answer any FIVE questions

(5 x 8 = 40 marks)

11. Explain with diagram, the horizontal system of coordinates. Bring out the merits and demerits.
12. Define twilight and find the condition for twilight to last the whole night.
13. Find the effect of refraction on the hour angle and declination of a star.
14. Define geocentric parallax and prove that $p = p \sin z$.
15. Define sidereal month and synodic month and find the relation between them.
16. Compare solar and lunar eclipses.
17. Prove that among any two planets, the inner planet moves faster than the outer planet.
18. Write a note on comets.

PART – C

Answer any TWO questions

(2 x 20 = 40 marks)

19. a) Prove with usual notations, the hour angle and azimuth of a star at rising or setting are given by $\cos h = -\tan \phi \tan \delta$
 $\cos A = \sin \delta \sec \phi$.
b) Trace the changes in the length of the day for a place on earth's equator. (12+8)
20. a) Derive tangent formula $r = k \tan z$ for refraction.
b) Explain with diagram, the Sundial. (10 + 10)
21. a) Trace the changes in the phase and elongation of the moon in one lunation.
b) Find the maximum number of eclipses in one year. (10 + 10)
22. a) Define Equation of time and show that it vanishes four times a year.
b) Explain different calendars. (10 + 10)

\$\$\$\$\$\$