

PSG COLLEGE OF ARTS & SCIENCE  
(AUTONOMOUS)

BSc DEGREE EXAMINATION DECEMBER 2019  
(Sixth Semester)

Branch – MATHEMATICS

ASTRONOMY

Time : Three Hours

Maximum : 75 Marks

SECTION-A (20 Marks)

Answer ALL questions

ALL questions carry EQUAL marks (10 x 2 = 20)

- 1 Define Celestial horizon.
- 2 What do you mean by Dip of horizon?
- 3 State laws of refraction.
- 4 Write down the analytical condition for perpetual night.
- 5 Define aberration.
- 6 Define angular diameter and angular radius.
- 7 Define equation of time.
- 8 Define mean anomaly.
- 9 Define Harvest Moon.
- 10 Define synodic period.

SECTION - B (25 Marks)

Answer ALL Questions

ALL Questions Carry EQUAL Marks (5 x 5 = 25)

- 11 a Explain the horizontal system of co-ordinates used to fix the position of any body in the celestial sphere.  
OR  
b Find an expression for Dip of Horizon.
- 12 a Find the duration of perpetual day in a place of latitude  $\phi > 90^\circ - \omega$ .  
OR  
b Find the tangent formula for refraction.
- 13 a Obtain the effect of geocentric parallax on the right ascension and declination of a place.  
OR  
b Prove that apparent position of a star due to stellar parallax describe an ellipse around the true position.
- 14 a Derive Kepler's equation.  
OR  
b Prove that the equation of time vanishes four times a year.
- 15 a Discuss the successive phases of Moon.  
OR  
b Find the maximum number of eclipses in a year.

SECTION - C (30 Marks)

Answer any THREE Questions

ALL Questions Carry EQUAL Marks (3 x 10 = 30)

- 16 In the spherical triangle ABC, prove that  
$$\cos b \cos C = \sin b \cot A - \sin C \cot A.$$
- 17 Derive Cassini's formula for refraction .
- 18 Find the effect of aberration on the longitude and latitude of a star.
- 19 Derive Newton's deductions from kepler's law of planetary motion.
- 20 Find the condition for the occurrence of a solar eclipse and total solar eclipse.