DHANALAKSHMI SRINIVASAN COLLEGE

OF ARTS & SCIENCE FOR WOMEN

(AUTONOMOUS)

(For Candidates admitted from 2018-2019 onwards)

UG DEGREE EXAMINATIONS APRIL – 2021

B.SC - MATHEMATICS

ASTRONOMY

Time: 3 Hrs   Max.Marks: 75

PART– A

CHOOSE THE CORRECT ANSWER.   (10*1=10)

1. The sum of the angles of a spherical triangle lies between
   a) 120° and 360°   b) 180° and 540°   c) 270° and 540°   d) 180° and 360°

2. The earth rotates about a diameter from west to east in _____ of apparent solar time
   a) 23 hours 58 minutes 4 seconds   b) 23 hours 56 minutes 8 seconds
   c) 23 hours 56 minutes 4 seconds   d) 23 hours 58 minutes 8 seconds

3. The time when the centre of the sun is 6° below the horizon is called
   a) Nautical twilight   b) Civil twilight   c) Astronomical twilight   d) None of the above

4. By the Law of refraction, which ray lie in the same plane at the point of incidence?
   a) Incident ray   b) Refracted ray   c) Normal ray   d) All of the above

5. The direction in which a body is seen from the centre of the earth is called its _____
   a) Heliocentric direction   b) Heliocentric longitude and latitude
   c) Goecentric direction   d) Geocentric longitude and latitude

6. Equation of time at any instant can be
   a) Positive   b) Negative
   c) Either positive or negative   d) Neither positive nor negative

7. The angle between standard direction and apparent direction is called the
   a) Heliocentric parallax   b) Geocentric parallax
   c) Annual parallax   d) Diurnal parallax

8. The horizontal parallax and the horizontal refraction of moon is about
   a) $57'$ and $34'$ b) $58'$ and $34'$ c) $58'$ and $35'$ d) $57'$ and $35'$

9. The period of one complete revolution of the moon around the earth relative to any fixed star is
   a) Synodic month   b) Sidereal month   c) Lunar month   d) Lunation

10. The age of moon on 1st January of the year is

    a) Golden number   b) Metonic cycle   c) Epact   d) Lunar number

PART – B

ANSWER ALL THE QUESTIONS   (5*7=35)

11. a) If $A'B'C'$ is the polar triangle of ABC then ABC is the polar triangle of $A'B'C'$.

<div align="center">(OR)</div>

    b) Find the relation between Right Ascension and longitude of the sun.

12. a) Find the condition that twilight may last throughout the night.

<div align="center">(OR)</div>

    b) Find Cassini's constants A and B.

13. a) Derive the calculation of the earth's orbit around the sun.

<div align="center">(OR)</div>

    b) Name the four astronomical seasons and explain?

14. a) Explain different kinds of years.

<div align="center">(OR)</div>

    b) The distance of a star S is 4 times as much as the distance of another star S_1. If the parallax of S_1 is $.0005''$ find the parallax of S.

15. a) Find the relation between Sidereal and Synodic months.

<div align="center">(OR)</div>

    b) Derive the condition for the occurrence of a lunar eclipse.

PART – C

ANSWER ANY THREE QUESTIONS   (3*10=30)

16. Explain four systems of celestial coordinates.

17. Derive the duration of twilight.

18. Derive Newton's deductions from Kepler's laws.

19. Find the effect of aberration on the longitude and latitude of a star.

20. Find the maximum number of eclipses in a year.