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Reg. No. :

Code No. : 30589 E Sub. Code : SEMA 6 A

B.Sc. (CBCS) DEGREE EXAMINATION,
APRIL 2020.

Sixth Semester

Mathematics — Core

Major Elective III — ASTRONOMY – II

(For those who joined in July 2017 onwards)

Time : Three hours

Maximum : 75 marks

PART A — ($10 \times 1 = 10$ marks)

Answer ALL questions.

Choose the correct answer :

1. On which of the following days, the equation of time is stationary?
 - (a) January 12 (b) March 15
 - (c) July 27 (d) October 3
2. During summer, the longitude of the sun increases from _____.
 - (a) 0° to 90° (b) 90° to 180°
 - (c) 180° to 270° (d) 270° – 360°

3. The eccentricity of the lunar orbit is _____.
- (a) $\frac{1}{18}$ (b) $\frac{1}{16}$
- (c) $\frac{1}{60}$ (d) $\frac{1}{15}$
4. How many times does the path of moon crosses the earth's orbit?
- (a) 12 (b) 23
- (c) 24 (d) 25
5. For a total lunar eclipse to occur, the angular distance of the moon's centre from the line of centres of sun and earth must be at most _____.
- (a) 22' 8" (b) 28' 6"
- (c) 26' 8" (d) 25' 6"
6. The minimum number of eclipses in a year is _____.
- (a) 1 solar eclipse (b) 1 lunar eclipse
- (c) 2 lunar eclipse (d) 2 solar eclipses

7. Which of the following is not an outer planet?
- (a) Mercury (b) Mars
(c) Jupiter (d) Saturn
8. The maximum elongation of Venus is nearly _____.
- (a) 28° (b) 35°
(c) 45° (d) 38°
9. Which of the following planets exhibit all phases?
- (a) Venus (b) Earth
(c) Mars (d) Pluto
10. Stefan's law suggests that if temperature is doubled, the radiation becomes greater by _____ times.
- (a) 2 (b) 4
(c) 8 (d) 16

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Prove that the equation of time vanishes four times a year.

Or

- (b) Write in detail about the causes of seasons.

12. (a) Find the relation between sidereal and synodic month.

Or

- (b) Explain about the surface structure of moon.

13. (a) Find the condition for the occurrence of a lunar eclipse.

Or

- (b) Find the length of earth's shadow.

14. (a) Describe about Bode's law.

Or

- (b) Prove that of two planets, the planet nearer to the sun moves with greater angular and linear velocities than the other.

15. (a) Find the elongation of the planets when they are stationary as seen from each other.

Or

- (b) Write about asteroids.

PART C — ($5 \times 8 = 40$ marks)

Answer ALL questions, choosing either (a) or (b).

16. (a) Find an analytic expression for the equation of time.

Or

- (b) Find the actual lengths of various seasons in a year.

17. (a) Explain in detail about lunar librations.

Or

- (b) Write about the metonic cycle, Golden number. Find the epact of the year 1952.

18. (a) Explain in detail about the changes in the elongation of a planet.

Or

- (b) Define sidereal period and synodic period of a planet. Find the relation between them.

19. (a) Discuss on ecliptic limits. Calculate the major and minor ecliptic limits.

Or

- (b) Find the maximum number of eclipses in a year.

20. (a) Write in detail about the different phases of a planet in one synodic revolution.

Or

- (b) Describe the astronomical facts of the planet – Jupiter.
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