

LADIES' EDUCATIONAL ASSOCIATION, MONTREAL.

ASTRONOMY.

MONDAY, DECEMBER 15TH :—2 TO 5 P.M.

Examiner,ALEXANDER JOHNSON, LL.D.

1. State the objections to the arguments used to show that the Earth is a thin solid crust enclosing a fluid molten mass. State also the principle of an investigation from which Sir Wm. Thomson has deduced that the earth, as a whole, is more rigid than steel. How are volcanoes accounted for, if the earth solidified first at the centre?

2. In what manner did Foucault show the rotation of the Earth by his pendulum experiment? Explain the principle of it generally.

State and explain in what direction, referred to the cardinal points of the compass, the plane of the pendulum will appear to rotate here at Montreal?

3. State the Law of Universal Gravitation.

a. Assuming the mass of the Sun to be 315,000 times the mass of the Earth, the radius of the Sun to be 425,000 miles, what would be the weight of a man on the surface of the Sun, whose weight on the Earth (radius=4000 miles) is 150 lbs.

4. Describe the principle of the method by which the distance of the Moon is found.

5. Define *sidereal day*, *solar day*, and *mean solar day*. How is it ascertained whether the common clock is right or wrong when it points to 12 o'clock (mid-day).

6. Describe an illustration or draw a diagram to show in a general manner the nature of the Moon's path round the Sun while she is at the same time revolving round the Earth. Show that it intersects the Earth's orbit twice in a month; and explain also how it is that the Moon always presents the same face to the Earth.

7. What is the cause of an eclipse of the Sun? At what time of the month only can it occur? Why have we not an eclipse of the Sun every month.

8. Describe a mode in which the number of whole days in the year may have been first ascertained. How soon, probably, would the extra quarter of a day be noted, and why? Give an account of the origin of *leap year*. Why is it also called *bissextile*?

9. State the names of the principal planets in the order of their distances from the sun, giving roughly the periodic times of the first five.

10. Name, in their order from west to east, the planets at present visible in the evening, stating in what constellations they are. Name the most remarkable star and group or groups of stars in any one of these constellations. Why do the planets set earlier now than in October last?