University of the State of New York

77TH EXAMINATION

SOLID GEOMETRY

MONDAY, June 8, 1891—1:15 to 4:15 P. M., only

40 credits, necessary to pass, 30

NOTE.—Draw carefully and neatly each figure in construction or proof, using letters instead of numbers. Arrange work clearly and logically.

1. Define (*a*) the projection of a line on a plane; (*b*) a trihedral angle; (*c*) a triangular pyramid; (*d*) a circular cone; (*e*) the section of a sphere. 5

2. How many vertical planes may be passed through a vertical line? how many horizontal planes, through a horizontal line? Give a reason for each answer. 4

3. Prove that if two intersecting planes are each perpendicular to a third plane, their intersection is also perpendicular to that plane. 5

4. Prove that a plane passed through two diagonally opposite edges of a parallelopiped divides it into two equivalent triangular prisms. 6

5. Is the position of a plane determined when the plane is perpendicular to a fixed line at a given point of the line? Give the reason for your answer. 2

6. A conical tent whose slant height is 14 feet, requires 220 square feet of canvas to cover it. Find the number of square feet of ground that the tent covers. (Assume $\pi = 3\frac{1}{7}$.) 6

7. Find the number of cubic yards of earth to be removed in constructing a tunnel 210 feet long, whose section is a semicircle with a radius of ten feet. (Assume $\pi = 3\frac{1}{7}$.) 7

8. The radii of the earth, the moon and the sun are to each other as 1, $\frac{3}{11}$ and 112 respectively. Find, in terms of v, which represents the volume of the earth, the volume (*a*) of the moon; (*b*) of the sun. 5