AN ROINN OIDEACHAIS

(Department of Education).

BRAINSE AN MHEÁN-OIDEACHAIS

(Secondary Education Branch).

LEAVING CERTIFICATE EXAMINATION, 1927.

PASS

APPLIED MATHEMATICS.

THURSDAY, 23rd JUNE.—AFTERNOON, 4 TO 6 P.M.

Five questions may be answered.

All questions carry equal marks.

Tables of Measures, Constants and Formulae, and Logarithm Tables may be obtained from the Superintendent.

1. What do you understand by "relative velocity"?

A body A is moving due north at 6·4 miles per hour and another B is moving east at 7·8 miles per hour. Find the magnitude and direction of the velocity of each relative to the other.

2. A body is falling from rest under gravity. During what second of its motion will it fall 80 feet? ($g = 32$).

3. A body is projected with a velocity of 120 feet per second at an angle of 35° with the horizontal. Find its velocity in magnitude and direction after 2 seconds.

4. What are the conditions of equilibrium for three forces acting in one plane on a body?

Two forces of 100 lbs. and 150 lbs. wt. inclined to one another at an angle of 120° act on a body. Find the third force, which will maintain equilibrium.

5. Forces of 2, 3, 5, 6 lbs. weight act in order along the sides of a square whose side is 1 foot. Find graphically or otherwise the line of action and the magnitude of the resultant.

6. Find the acceleration of a mass moving down a smooth plane of inclination A° to the horizontal.

Two masses of 6 and 4 lbs. lying on a smooth plane of inclination 30°, are connected by a light string passing over a smooth peg at the top of the plane. Find the acceleration of the 6 lb. mass and the tension of the string.

7. What is meant by the centre of gravity of a body?

From a square lamina the triangle formed by joining two adjacent vertices to the centre is cut out. Find the centre of gravity of the remainder.

8. A train of W tons starts from rest and acquires a velocity of V feet per second in t seconds. Find the force exerted by the engine if the resistance to motion is R lbs. wt. per ton

Evaluate when $W = 100$, $V = 40$, $t = 75$, $R = 20$.