

Lettering and figuring: Principal styles used in survey draughting; names and characters and principal uses; best proportions. Spacing methods. Designing of titles on maps.

Hill work, vertical hachure, contour-lines, form-lines, difference between these latter; wash methods; conventional lighting; steep hills, precipices, rolling country, plains. (50 marks.)

Instruments.

(3.) The pencil, the pencil-point, drawing a straight line with; soft and hard pencil lines; inking over.

The pen, the drawing-pen, best pattern of; point of pen, use of pen, holding of pen, cleaning pen. The straight-edge, testing of, care of; cutting-edge, ruling-edge. The parallel ruler, sliding, rolling, care of, testing of. Compasses, the different kinds of, and their purposes. The compass joint, and the compass-points.

The scales, measuring with; are not rulers; testing of. Offset scales, plotting scales, diagonal scales, vernier scales, marquois scales, scales of equal parts, logarithmic scales. Artificial and natural units, definitions, translation from each to each.

Protractors, purpose of, rectangular, circular, vernier.

The drawing-board, ebony edge; warping and preventives.

The pantograph and eidograph; interrelation of fulcrum, tracer, and pencil-point; positions when reducing or enlarging; rule for setting eidograph; to find scales not on pantograph.

The planimeter, fixed and rolling patterns and Coradi compensating pattern; rule for areas on different scales; what unit is the result given in; point in centre and the figure on the weight. (50 marks.)

Practice.

(4.) Drawing a straight line, drawing a very long one, producing a line accurately. Drawing a right angle accurately in middle of a line, at end of a line.

Purpose of maps, selection of a projection, and principles governing the selection. The graticule, method of laying it down, purpose of the graticule (*a*) in a rectangular system, (*b*) in a curvilinear system of projection. Plotting by rectangular co-ordinates, by geographical co-ordinates, by protractor, by the natural functions of angles.

The field-book, methods of keeping, exercises in reading and the plotting from.

Scaling lines, use of pricker, parallax of edge of scale, plotting to scale on shrunk or expanded paper, laying down scales on artificial and natural scale for the same map.

Enlarging and reducing a map by pantograph or eidograph, by plotting, by other methods—*i.e.*, photography, radial scaling, elastic band, &c.

Reproduction of maps by photography, outlined sketch of process; character of original required. (50 marks.)

Schedule C.—General Departmental Knowledge.

Administrative divisions of New Zealand—*i.e.*, Land districts, names of centres of; field staff, indoor staff.

Functions of Department: Survey and settlement of land; land and forest and reserves administrations. Acts administered by Department.

Details of practice and procedures in work of departmental branches (Land Transfer, Native, Statutory, Titles, &c.).

Organization of Department and duties of officers: Permanent Head; technical head; clerical staff, computing staff, draughting staff; maps controlled by draughting staff, the public maps, lithograph maps, county index or tenure maps, sale-plans, professional maps, the working plan and field-book, semi-public maps.

Departmental map indexes, the record map. Crown grant, Land Transfer, and road Record maps are not public maps, but office indexes only.

Kinds of surveys — trig., topo., towns, settlement, Land Transfer, Public Works, roads, and railways. Districts required for survey and mapping purposes; meridional circuits; survey districts; survey blocks; irregular or old districts; system of plotting required by departmental regulations; true bearing, magnetic bearing, variation, the unit of length.

The working plan and field-book, their supreme importance, unique value as evidence, basis of title, of reproduction of boundaries, consequent care in preservation and handling; copies valueless as evidence, foundation of subsequent transactions of the Department.