

Preparation of projected drawings of simple machine parts from pictorial views, and *vice versa*, both free hand and instrumental, including elementary sectional views.

NOTE.—New Zealand standard drawing office practice is to be adhered to in all details.

Drawing (b)

Scales and their correct use.

Methods of setting out engineering drawings.

Intersection of solids.

Development of simple pipe junctions; sheet and plate constructions.

Form of involute teeth in contact.

Conventional representation of gear wheels and trains.

Drawing and general knowledge of machine and constructional details such as:—

Riveted and welded joints, pipe joints, pulleys, couplings, bearings and simple types of valves and cocks.

Simple electrical fittings, including switches, cable terminals, and supports.

Drawings to include sectional views, introducing special types—for example, full and half sections and broken-out sections. Correct location of parts from centre lines or finished surfaces.

Auxiliary views.

Reading of first and third angle drawings and prints, and application of standard symbols and method of expressing tolerances.

A knowledge of the processes of making tracings and reproductions.

NOTE.—First angle projection will be used and asked for in the examinations, but it is expected that students shall be given instruction in the standard American or third angle projection during the course of their training.

Electrical Engineering. (Four papers—three hours each)

Paper (a): Electric Circuit Theory

Circuit calculations involving combination of resistance, inductance, and capacitance, three-phase circuit calculations, treatment of A.C. circuits by use of the symbolic notation, simple locus diagrams, harmonics, resonance in series parallel and coupled circuits, simple wave filters, star-mesh transformations, transient phenomena in simple L.C.R. circuits. Calculation of insulation resistance and capacitance of, and electrostatic stress in, concentric cable.

Paper (b): Electrical Machinery

The operating characteristics of series, shunt, and compound D.C. generators and motors and of alternators, synchronous motors and induction motors. Methods of motor starting. Principles of power factor correction. Vector diagram and equivalent circuit of the transformer, autotransformers, instrument transformers.

Rectifiers.—Characteristics and essential connections of thermionic, metal, and mercury are rectifiers. Smoothing circuits.

Paper (c) Electronics

Dynamic characteristics of the vacuum diode and triode valves. Photoelectric cells, resistance and photoemission types.

Illumination.—Laws, units and standards of illumination, measurement, photometry. Polar curves. Mean hemispherical candle-power. Secondary illumination. Reflection factors. Light sources. Comparison of filament and discharge types of lamp for domestic, factory, office, and street lighting, colour of light source and its effect. Elementary