

2. Principles and practice examination—requires ability to apply engineering principles and judgment to problems in general engineering fields such as chemical, civil, electrical and mechanical fields. Questions involving economic analysis will be included.

(e) *Grading of written examinations, passing grades and retakes.*

1. Experience ratings will not be weighed as a part of the examinations.

2. On each examination A or B a successful applicant must average at least 70%. He must not fall below 60% in part I or part II of either examination.

3. If an applicant fails in parts I or II of examination A or B, he may at the discretion of the board be not required to retake the parts he has passed, or he may be required to retake the entire examination.

(f) *Scope of written examinations.*

1. Examination A.

Part I—This portion requires a knowledge of physics, chemistry, mechanics, and materials of construction such as could be acquired from courses which are a part of an accredited engineering curriculum.

Part II—This portion requires a knowledge of the fundamentals of engineering and of the particular field pursued by the applicant such as could be acquired from courses in electrical circuits and machinery, hydraulics, thermo-dynamics, structures, and machine design which are a part of an accredited engineering curriculum.

2. Examination B.

Part I—This portion is in a general engineering field selected by the applicant from a listing specified by the engineering section such as chemical, civil, electrical, mechanical, mining, metallurgical, etc. A separate examination will be offered for each general field.

Part II—Specialty. This portion is in a sub-field selected by the applicant from a listing specified by the engineering section. Questions involving engineering economics, ethics and law may be included. The applicant may be required to prepare an engineering report from a list of assigned topics.

(6) EXAMINATIONS FOR LAND SURVEYOR. (a) *Examinations required.* Parts I, II, III and IV. Each part 4 hours in length. Total 2 days (16 hours).

1. The applicant shall be required to pass the 16-hour written examination.

2. Oral examinations will be at the discretion of the land surveyors' section.

(b) *Place of examinations.* The examinations will be held at sites designated by the board.

(c) *Time of examinations.* To be arranged.

(d) *Grading of written examinations; passing grades.* 1. Experience ratings will not be weighed as a part of the examinations.

2. The applicant must not fall below 60% in part I, part II, part III or part IV, and must average at least 70% in a combination of: part I and part II; and part III and part IV.

3. If an applicant fails in parts I, II, III or IV of the examination he may at the discretion of the board be not required to retake the parts he has passed, or he may be required to retake the entire examination.

(e) *Scope of written examinations.* The examination will be made up of questions covering some phases of the following subjects:

1. Fundamentals of mathematics, algebra, trigonometry and geometry; the history, principles and applications of the U. S. System of Public Land Surveys, Wisconsin plane coordinate surveys, and geodetic surveys; the instructions of the U. S. Land Office relative to the relocation of lost and obliterated corners and the subdivision of sections; the legal essentials of resurveys, including those involving disputed boundaries, defective deed descriptions, riparian rights, adverse possessions, etc.; Wisconsin statutes relative to land surveying, including the preparation and filing of plats; the writing and interpretations of land descriptions; the technical essentials of land surveying and subdivision of lands, including practical problems requiring a knowledge of the basic theory and fundamental concepts in field astronomy, geometry of curves, topography and photogrammetry.

History: 1-2-56; r. and recr. (3); am. (5)(e)3, Register, February, 1961, No. 62, eff. 3-1-61; cr. (6), Register, August, 1965, No. 116, eff. 11-1-65; r. and recr. (3)(a), Register, November, 1966, No. 131, eff. 12-1-66; r. and recr. (4)(d), eff. 7-1-67; and r. and recr. (6), eff. 8-1-67; Register, April, 1967, No. 136; am. (5)(d)2, (5)(f)2 and (6)(a)2, Register, July, 1968, No. 151, eff. 8-1-68; r. and recr. (5)(b) and (c) and (6)(b) and (c), Register, February, 1969, No. 158, eff. 3-1-69; am. (3), (6) (a) 2, and (7), Register, January, 1971, No. 181, eff. 2-1-71; r. and recr. (5), Register, September, 1971, No. 189, eff. 10-1-71.

A-E 1.20 Designer permits, limitations. (1) Permits for the design of engineering systems shall be issued in the following fields:

- (a) Heating, ventilation and air conditioning systems;
- (b) Plumbing systems;
- (c) Electrical systems;
- (d) Fire protection systems; and
- (e) Industrial systems.

(2) Permits issued in any of the fields designated in subsection (1) shall be further limited to subfields as are determined by the joint board and recognized in engineering design practice.

(3) Permit numbers shall designate the fields and subfields permits are restricted to.

History: Cr. Register, March, 1971, No. 183, eff. 4-1-71.