

1933

## Machine Construction (2nd Year): Technical School Examinations 1933

Department of Education: Technical Instruction Branch

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# COURSES IN MECHANICAL ENGINEERING.

(59.)

AN ROINN OIDEACHAIS.  
(Department of Education.)

BRAINSE AN CHEÁRD-OIDEACHAIS.  
(Technical Instruction Branch.)

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TECHNICAL SCHOOL EXAMINATIONS.  
1933.

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MACHINE CONSTRUCTION.  
(Second Year.)

*Friday, May 5th—7 p.m. to 10 p.m.*

*Examiner*—ERNEST E. JOYNT, ESQ., M.I.MECH.E.

*Co-Examiner*—J. P. HACKETT, ESQ., B.E., A.R.C.S.O.I.

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## GENERAL INSTRUCTIONS.

You are carefully to enter on the Answer Book and Envelope supplied your Examination Number and the subject of examination, but you are not to write your name on either. No credit will be given for any Answer Book upon which your name is written, or upon which your Examination Number is not written.

You must not have with you any book, notes, or scribbling-paper.

You are not allowed to write or make any marks upon your paper of questions.

You must not, under any circumstances whatever, speak to or communicate with another candidate; and no explanation of the subject of the examination may be asked for or given.

You must remain seated until your answer book has been taken up, and then leave the examination room quietly. You will not be permitted to leave before the expiration of twenty minutes from the beginning of the examination, and will not be re-admitted after having once left the room.

If you break any of these rules, or use any unfair means, you are liable to be dismissed from the examination, and your examination may be cancelled by the Department.

*Three hours are allowed for this paper. Answer-books, unless previously given up, will be collected at 10 p.m.*

## INSTRUCTIONS.

*Read the General Instructions on page 1.*

(a) Written answers and freehand sketches must be given in the answer-book, the drawing-paper being used *only* for the finished drawings of Question No. 1.

(b) Drawings and sketches may be made in *pencil*.

(c) Answers to questions must be written in *ink*.

(d) Write the number of the question distinctly in the margin of your paper before the answer.

1. Connecting Rod Details.—A drawing is supplied showing the complete assembly of a connecting rod end. From this you are required to draw to scale a set of separated details. The number and arrangement of the views of each part should be so chosen as to give all necessary information. Dimensions are not required, but the material of which each part is to be made should be neatly printed on the drawing. Scale, full-size for the bolt and nut, half full-size for the other parts.

[70 marks.]

*Two only of the following questions are to be attempted.*

2. Bolt and Nut.—Referring to Question 1, state why the connecting rod bolt is not of the same diameter for all its length, also describe the use and advantages of the "castle" type of nut.

[15 marks.]

3. Piston Rings.—Describe with the aid of sketches how piston rings are turned, finished and placed in position: Sketch a suitable joint showing a device for preventing the rings from slipping round in their grooves.

[15 marks.]

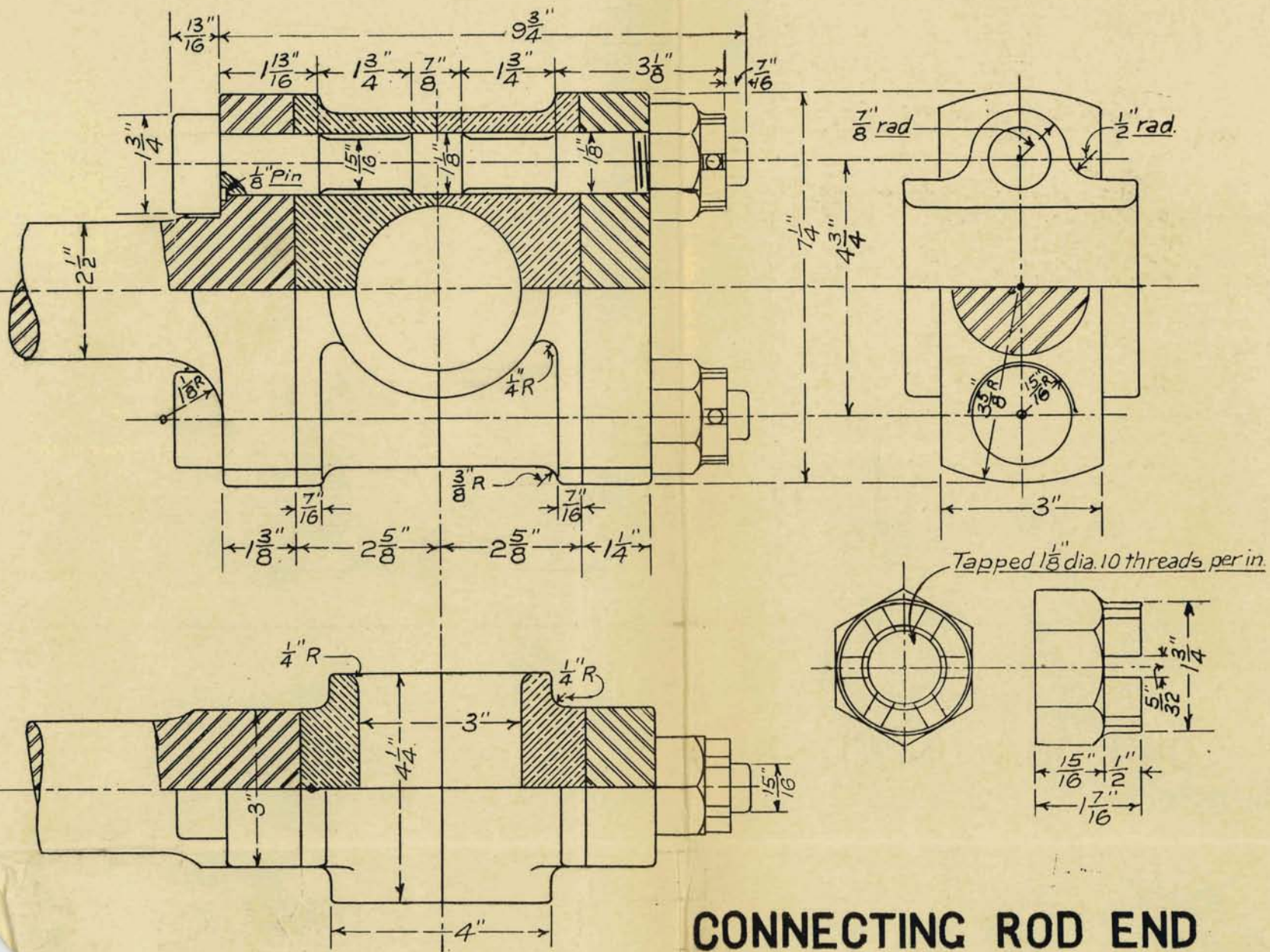
4. Boiler Details.—Show by means of well proportioned sketches *either*, (a) the arrangement of a manhole joint, *or*, (b) the method of attaching the front plate of a horizontal boiler to the cylindrical shell.

[15 marks.]

5. Workshop Tools.—Make a neat sketch showing, *either*, (a), a "roughing" tool,  $\frac{3}{4}$ -inch square steel, secured in position in the slide rest of a lathe against the work, *or*, (b) the tapered shank of a twist drill in position in the bottom of the revolving spindle.

[15 marks.]





**CONNECTING ROD END**