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Motor Car Engineering (2nd Year): Technical School Examinations 1934

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COURSE IN MOTOR CAR ENGINEERING.

(71)

AN ROINN OIDEACHAIS.
(Department of Education.)

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

TECHNICAL SCHOOL EXAMINATIONS.
1934.

MOTOR CAR ENGINEERING.
(Second Year.)

Wednesday, May 23rd—7 p.m. to 10 p.m.

Examiner—RICHARD COULSON, ESQ., A.R.C.SC.I., M.S.A.E.

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

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 commencement 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

You are not permitted to attempt more than SEVEN questions.

Do not re-write the questions in the answer book.

The use of drawing instruments is allowed.

Write the number of the question before the answer.

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1. Specify a suitable steel for each of the following parts: Gudgeon pins, valves, rear axle drive shafts.

State the treatment, if any, to which they should be subjected and give briefly the properties which render them suitable for these parts. [45 marks.]

2. Give a list of the fuels that can be used, either mixed with or as an alternative to petrol, in internal combustion engines. State the sources from which they are obtained and describe briefly any radical differences in engine design which are necessary when they are used. [40 marks.]

3. Make a sectional sketch of a piston suitable for an engine of 65mm. bore, in which provision is made to minimise piston slap. [45 marks.]

4. Describe and illustrate by means of sketches two types of air cleaner suitable for use on cars, commercial vehicles or tractors, and state the object of fitting such an accessory. [40 marks.]

5. Sketch, in section, some form of roller bearing capable of taking both radial load and end thrust.

Name some of the positions where bearings of this type can be used on a heavy commercial vehicle chassis, and state how you would adjust such a bearing when fitted, for example, to a front wheel hub. [45 marks.]

6. Make a sketch shewing the overhead rocker gear of a pushrod operated inlet or exhaust valve. Shew the provision made for adjusting the clearance and give average figures for this in the case of a modern engine. [40 marks.]

7. State briefly the principle underlying the Syncromesh system of easy gear changing and illustrate your answer by means of a diagrammatic sketch. [40 marks.]

8. Explain why it is necessary to fit universal joints in the transmission system of a car or lorry. Sketch some well-known form of proprietary universal joint (not fabric ring type) and shew particularly the provision made for lubricating it. [45 marks.]

9. Describe and illustrate a shock absorber of the type which depends for its action on frictional surfaces (i.e., not on fluid friction). Shew how it is attached to the axle or the chassis member so as to permit of universal movement. [40 marks.]

10. Describe how you would reface and reseat the valves if when overhauling a poppet valve engine you found their condition such that this was necessary. Make sketches of any special equipment you would use when carrying out the work. [40 marks.]