



Principal Learning

Engineering

OCR Level 3 Principal Learning **H811**

OCR Report to Centres January 2014

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This report on the examination provides information on the performance of candidates which it is hoped will be useful to teachers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding of the specification content, of the operation of the scheme of assessment and of the application of assessment criteria.

Reports should be read in conjunction with the published question papers and mark schemes for the examination.

OCR will not enter into any discussion or correspondence in connection with this report.

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OCR REPORT TO CENTRES

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F559 Instrumentation and control engineering

Section A - Most learners attempted ten questions.

Section B – All learners attempted four or more questions.

Where a learner answered more than four questions in section B, the four highest marks obtained were used towards the overall mark for the paper. Centres are reminded to encourage learners to attempt four questions only and spend their time on providing accurate, well presented and correct answers rather than spending time on additional questions.

In a number of cases learners had started a question and then found that they could only answer one part of it. Again, it is good practice to encourage learners to read the whole of each question before deciding which options to answer.

In some cases learners appeared not to have read the question fully and went on to provide a response that was not actually relevant to the question. Learners should be advised to read the complete question before attempting a response.

Centres are reminded to encourage learners when answering questions that they limit their answers to the space provided on the answer sheet.

Section A

- 1 This was a popular question attempted by all learners with a number of learners being awarded full marks and showing good knowledge of input devices.
- 2 Generally well answered.
- 3 Generally well answered with the majority of learners correctly stating two practical applications of a Light Dependant Resistor (LDR). One slightly obscure answer of 'water pollution' gained a mark as the LDR could be used to check for cloudy liquids.
- 4 Most learners struggled with this question, showing limited knowledge of the symbol for a 3-port valve. The symbol was often not well drawn.
- 5 Generally well answered with the majority of learners correctly naming three examples of instrument displays.
- 6 The formula for overall gain in a positive feedback system was relatively well known. There were some errors in the detail but in general learners gained at least one mark for this question.
- 7 Generally well answered with the majority of learners correctly stating two industrial applications of a Programmable Logic Controller (PLC).
- 8 Generally well answered with the majority of learners correctly explaining what is meant by the term 'digital signal'.

Section B

Question one

The majority of learners answered this question, with most gaining marks in all three parts.

- (a) Most responses had good explanations of what is meant by the term 'control' in a control system.
- (b) Learners presented a wide range of responses. Many responses lacked depth of treatment.
- (c) Generally well answered with the majority of learners correctly stating two practical applications for a control system other than a radio receiver.

Question two

Not a particularly popular question with limited responses being submitted for all parts.

Question three

- (a) Most responses had reasonable explanations of what is meant by the term 'multiplexer'.
- (b) Generally well answered with the majority of learners correctly stating two applications of a multiplexer used in domestic products.
- (c) Most learners did not provide a very accurate labelled diagram of a multiplexer. The descriptions varied in quality; in general learners knew that it involved putting more than one signal down the same route but after that the detail was hazy in many cases.

Question four

A popular question.

- (a) Generally well answered with the majority of learners correctly stating two benefits of using a light emitting diode (LED) as compared to a signal lamp. A few learners stated 'cheaper', which required further explanation in order to be awarded a mark.
- (b) Generally well answered with the majority of learners correctly stating two applications of a light emitting diode (LED).
- (c) Very few responses gave an accurate description of how the LED circuit worked. To gain high marks the description must include reference to the touch contact switch, 100K resistor, 470R resistor, darlington pair, current gain and the LED.

Question five

- (a) Most responses had reasonable explanations of what is meant by the term 'actuator' used in a control system.
- (b) Not very well answered by the majority of learners.
- (c) Quality of responses varied widely, some were largely correct but others showed limited understanding of any type of motion.

F560 Maintaining Engineering Systems

This unit is initially marked by the centre and then moderated by OCR. Centres submitted the Internal Assessment Mark Sheet and the Centre Authentication Form correctly filled in.

The following points may need to be considered:

- All learners presented work in a neat and tidy fashion but the use of a contents list with page numbers should be encouraged. Centres need to provide annotation on the work submitted.
- Very good use was made of images and ICT; this and other similar types of media are to be encouraged.
- Most of the folders moderated followed a standard type of presentation with similar material being used. In general terms the centres should be empowering learners to take charge of their own learning and development.
- To obtain higher marks more attention needs to be paid to the assessment criteria under consideration. The main area to consider is when statements have to be justified and when conclusions have to be drawn.

Assessment Criteria 1

Learners, in general, showed an ability to select and construct a range of data and to apply basic statistical methods to it. All learners satisfactorily undertook some form of maintenance activity. More detail was needed to be provided when dealing with justified conclusions.

Assessment Criteria 2

Some learners showed only a basic ability to identify and explain the various types of system failure and their consequences. In some cases the methods used to predict systems failure was not well known. More detail needed to be provided when dealing with justifications.

Assessment Criteria 3

Some learners needed to show a better awareness of the correlation between maintenance plans and operational effects. In a number of cases learners provided a basic 'cost benefit' analysis in regards to their maintenance plans. The justification of financial factors needed to be covered at a deeper level.

Assessment Criteria 4

All learners carried out a cost benefits analysis for a reasonably complex maintenance plan but in some cases the justification of the financial factors used needed to be at a deeper level.

F563 Mathematical techniques and applications

Section A - Most learners attempted all fifteen questions.

Section B – All learners attempted three or more questions. Centres are reminded to encourage learners to attempt three questions only and spend their time on providing accurate and correct answers rather than spending time on other questions for which they will get no reward.

When attempting a question a few learners gave a final answer without showing any working. It is always in the best interest of the learner to show as much detail as possible because if the answer is incorrect nothing can be awarded but if information is provided of how the final answer was arrived at, marks can often be awarded for the methods employed

Centres are reminded to encourage learners when answering questions that they limit their answers to the space provided on the answer sheet.

- 1 Generally well answered but in a few cases learners did not complete the simplification but left it as $6x - 15 - 4x$.
- 2 Generally well answered.
- 3 Generally well answered. A number of learners could not find a common denominator of 20.
- 4 Generally well answered. In a few cases after finding $18x + 24 = -6x - 18$ learners could not correctly arrive at $x = -1.75$.
- 5 Generally well answered.
- 6 Generally well answered.
- 7 A poorly answered question. The majority of learners did not provide any reference to the sine of an angle.
- 8 A poorly answered question. The majority of learners provided no reference to $\sec x = 1/\cos x$ and $\operatorname{cosec} x = 1/\sin x$.
- 9 Generally well answered. In a few cases the rules of differentiation were not known.
- 10 A mixed response. Most learners differentiated $\sin x$ but a number of incorrect answers were given for $1/x$.
- 11 A mixed response. Most learners stated the constant C but a high proportion of learners did not know the integral for $\cos 4x$.
- 12 In most cases the rules of integration were not known.
- 13 The majority of learners answered this question correctly.
- 14 Generally well answered.
- 15 The majority of learners struggled with the meaning of a 'dependent event'.

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