OCR
Oxford Cambridge and RSA

Cambridge Technicals Level 3

Engineering

05822-05825 & 05873

Unit 4 Principles of Electrical and Electronic Engineering

OCR Report to Centres June 2018

About this Examiner Report to Centres

This report on the 2018 Summer assessments aims to highlight:

- areas where students were more successful
- main areas where students may need additional support and some reflection
- points of advice 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.

The report also includes links and brief information on:

- A reminder of our **post-results services** including **reviews of results**
- Link to **grade boundaries**
- **Further support that you can expect from OCR**, such as our CPD programme

Reviews of results

If any of your students' results are not as expected you may wish to consider one of our Reviews of results services. For full information about the options available visit the OCR website. If University places are at stake you may wish to consider priority service 2 reviews of marking which have an earlier deadline to ensure your reviews are processed in time for university applications: http://www.ocr.org.uk/administration/stage-5-post-results-services/enquiries-about-results/service-2-priority-service-2-2a-2b/

Grade boundaries

Grade boundaries for this, and all other assessments, can be found on the OCR website.

Further support from OCR

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Attend one of our popular CPD courses to hear exam feedback directly from a senior assessors or drop in to an online Q&A session.

https://www.cpdhub.ocr.org.uk

CONTENTS

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OCR REPORT TO CENTRES

Unit 4 Principles of Electrical and Electronic Engineering

General Comments:

Overall performance in this examination continues to improve. There is increasing evidence of understanding of the principles of electrical engineering, evidenced, not least, by confidence in the use of the correct equations and formulae to deduce the right answers to calculations.

Questions on the fundamentals of electricity and electronics (1, 2, 3, and 5) were generally answered well. Questions on systems (4, 6), with a greater reliance on explanation and recall, were not answered so well. Question 6, for instance, was answered well only in a small minority of cases, despite the assistance of a detailed diagram of the system.

Many responses showed a lack of familiarity with common circuit symbols, leading to a lack of clarity in drawing diagrams. It would seem that more time spent early on to embed these ideas would avoid ambiguity and lost marks.

Candidates demonstrated a greater confidence with scientific units than hitherto. Question 3 was answered particularly well in this regard.

There was a notable increase in “No Response” without evidence that this was due to a lack of time. Candidates should, of course, be encouraged to attempt all questions where time permits. The best results were only possible by a combination of careful calculation and a sound grounding in the principles involved.

Comments on Individual Questions:

Question 1

1(a)(i) was answered correctly by most candidates, but there was a number who gave a negative value for one or both resistors which was not condoned.

In 1(a)(ii) candidates were generally able to provide most of the required details. 0v to non-inverting input was the most common oversight.

Question 2

For 2(a)(i) most candidates were able to provide the power supply, inductor, and resistor correctly. There were many omissions of the capacitor, or ambiguous symbols were used.

In 2(a)(ii) the most common mistake amongst those who attempted the question was with re-arrangement of the formula resulting in the candidates cancelling out $2\pi 60$.

Question 3

Most candidates were able to answer 3(a) this correctly. Few errors were seen across the four parts.

Question 4

Most attempted 4(a)(i), but often there was either an incorrect arrangement of diodes or a response that was worth little credit.

Those who understood full wave rectification were successful in 4(a)(ii).

Likewise in 4(b), though those who were comfortable with a sinusoidal representation of AC did well here.

Question 5

There was a good level of success across all parts of the question, with an improving standard of response to questions linking Boolean algebra and truth tables.

Question 6

6(a) was the least successful question on the paper, with the greatest occurrence of “No Response” or responses that failed to gain any credit. Only one candidate was awarded full marks for both parts, while one mark overall was the norm. This was not a question that could be answered well simply from first principles, even from a position of strength in electromagnetism. In 6(a) there needed to be evidence of an understanding that a DC motor starts up generating no back emf, and so requires to have a cascade of resistors in series with the armature, which can be backed off as motor speed builds up in order to limit the current and avoid damage.

In 6(b), similarly to 6(a) there was little success in responses. Any marks that were gained seemed to be by germs of a theory built around the words ‘no-volt trip coil’, with the exception of a small number of candidates. What was needed was a clear exposition of the dangers to the motor of a dip or loss of supply voltage, requiring a means to detect such dip or loss and rapidly disconnect the supply voltage. By the same token the device had to reset the starting condition in the event that the supply was reinstated.

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