Examiners' Report
Summer 2010

Principal Learning

Engineering
EG308 Mathematical Techniques and Applications for Engineering

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1. PRINCIPAL EXAMINER'S REPORT – LEVEL 3 UNIT 8

Question 1a
A good proportion of candidates achieved the full transposition and applied the formula correctly to obtain the required solution. Some candidates struggled with the basic transposition laws; leaving the value at the r^3 stage instead of completing the transposition by showing that v would equal the cubed root of the resulting formula.

Question 1b
There was varying degrees of success when applying the laws of logarithms to this question. Some candidates did not attempt the task. In comparison, many achieved the first stage in the solution, but did not progress to show that the addition of logs was obtained by multiplying. Some candidates achieved a solution without a clear indication of the laws. This was achieved by calculator rather than application.

Question 1c
In this question, candidates again had problems applying the rules of transposition and logarithms in n order to produce a solution. A small number of candidates correctly applied this and obtained the correct solution.

Question 2a
This was generally a well answered question. Some candidates used estimates to obtain values. Many candidates either overlooked or did not understand how to show the law of the line. This part of the question was not attempted by many candidates. Where candidates plotted the graph, there were some inaccuracies that led to statements that the effort when w= zero, would also be zero.

Question 2b
Candidates struggled in factorising the formula. There were many examples where candidates removed d from the equation and part factorised. A small number of candidates managed to remove d^2 from the equation to fully factorise. Several candidates tried to solve the problem rather than factorise.

Question 2c
This question was answered quite well. A range of techniques were evident including trial and error. The problem in itself was quite simple, numerically. If the values were more complex, it would have been unlikely to solve by trial and error and candidate would have had to apply the correct algebraic technique to solve it.

Question 3a
Many candidates achieved the correct solution for this task applying the correct trigonometric formula using the sine of the angle. There were many basic errors though where candidates tried using the tangent for the given angle or Pythagoras Theorem to try and obtain a solution.

Question 3b
This question was well answered. Many candidates plotted the graph using the four angle values, producing a Vee shape, although this did not affect the overall solution.

Question 3c
Generally, this question was well answered by the candidates. However, some basic errors were evident; for example, some candidates applied the rules of a right angled triangle, others simply added the two sides together.

Question 4a
Candidates achieved quite well in this question, although few achieved full marks. A common error was using the diameter rather than the radius when calculating the surface area of the cone.

Question 4b
This question was generally well answered, although some candidates did not show the final solution to the nearest degree as required. Centres may wish to remind candidates to ensure the question is read fully before attempting to avoid this error. There were some common errors with the conversion and although the formula was not shown on the paper, it is expected that candidates would know the correct technique.

Question 4c
Again, errors were made in the application and sometimes selection of the correct formulae. Many candidates achieved a partial solution, getting the value to revolutions per second, but not completing the conversion to radians per second.

Question 5a
The mode was identified correctly for the majority of candidates.

Question 5b
Candidates performed well here, showing the ordering of the values and obtaining the median.

Question 5c
Candidates performed well here, most correctly adding the values and using the total number of these to obtain the mean.

Question 5d
In this descriptive task, some candidates interpreted the data incorrectly, suggesting the higher MTTF meant more failures. Generally, candidates tended to repeat values that were obtained in the previous statistic tasks.

Question 6a
Candidates generally demonstrated that they understood the term tangent, indicating this on the curve. Some solutions were obtained, with minor errors where candidates did not identify the negative change in current.

Question 6b
Few candidates achieved the solution for this question. There were many examples where candidates simply substituted values for t, and worked a solution rather than applying the rules of differentiation.

Question 6c
Candidates had difficulty with this question. Some achieved the correct answer by applying the integration technique correctly. Many however, simply substituted the values for t to obtain an incorrect solution.

2. STATISTICS

2.1. Level 3 Unit 8 Mathematical Techniques and Applications for Engineering

	Max. Mark	A*	A	B	C	D	E	U
Raw boundary mark	60	52	46	40	34	29	24	0
Points Score	14	12	10	8	6	4	2	0

Notes

Maximum Mark (raw): the mark corresponding to the sum total of the marks shown on the Mark Scheme or Marking Grids.

Raw boundary mark: the minimum mark required by a learner to qualify for a given grade.

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