

6165-044 Structural Mechanics 3 Principles



Examiners' report – **June 2014**

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1 Introduction

The purpose of this document is to provide centres with feedback on the performance of candidates in the **June 2014** examination for 6165-044 Structural Mechanics 3 Principles.

2 Feedback on candidate performance

General feedback

The following comments are intended to help candidates prepare for the examination by having a better understanding of what is expected of them. The feedback within this report would also be valuable to tutors in understanding candidates' difficulties in answering questions and the areas where more guidance is required.

The June 2014 series question paper was found to be in accordance with the qualification requirements.

Candidates appeared to have no issues with the paper format.

Many candidates scored high scores, however quite a number of candidates achieved low marks and often were only able to attempt Questions 1b, 4a and 5. This would suggest that some candidates has grasp the syllabus really well and this shows in their response. Conversely, centres are remind to teach to the syllabus and ensure all areas are covered before entering candidates for this exam.

Question	Syllabus ref	Examiner comments
1	44.13 44.14	<p>a) This was well answered by many students, but for some candidates their approach and response to this question would suggest that this area of the syllabus had not been taught. The only issue here was that some calculations or diagrams did not include the correct units.</p> <p>b) Come candidates were able to correctly calculate the maximum BM and plot the resulting BM diagram. Centre attention should be drawn to the need to teach candidates cantilever loaded beams. The explanation of the term 'point of contraflexure' was often not answered by candidates.</p>
2	44.15 44.16	<p>a) Most students were able to calculate the centroid accurately.</p> <p>b) The second moment of area was answered only satisfactorily. Some candidates answered this question well, however, some candidates were unable to apply the given formulae to produce the correct value.</p> <p>c) Despite being a similar question to previous series this was poorly answered by many candidates who failed to use the correct y_{max} value or were unable to manipulate the formula to find the maximum load obtainable.</p>
3	44.17 44.18	<p>a) This was well answered by many candidates who often received about half the allocated marks. In the cases, candidates did not attempt this question. Some candidates correctly calculated the load in a member but failed to identify clearly if it was a strut or a tie. Some candidate's marks were poor and only a few attempted an alternative method (as allowed in the question stem).</p> <p>b) This was well answered by some candidates who achieved about half of the allocated marks. Candidates correctly worked out the slenderness ratio but were then unable to interpolate the p_c stress and then calculate the resulting safe load of the column.</p>

4	44.19 44.22	<p>a) Most candidates achieved about half of the allocated, but other candidates attempt of this question was poor with diagrams presented on non graph paper with no scales and poor solutions offered.</p> <p>b) Many candidates achieved some method marks for this question only. Often they were unable to correctly calculate the thrust and weight of the wall resulting in factors of safety being inaccurately calculated.</p>
5	44.18	<p>This was well answered by a significant proportion of candidates. Some candidates incorrectly scaled values from the diagram. In addition the question clearly requests students to identify if the members were struts or ties. Candidates stall used arrow notation or the terms compression or tension. Some allowance and marks were taken into account for this.</p>

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