



Course Report 2014

Subject	Engineering Science
Level	National 5

The statistics used in this report have been compiled before the completion of any Post Results Services.

This report provides information on the performance of candidates which it is hoped will be useful to teachers/lecturers in their preparation of candidates for future examinations. It is intended to be constructive and informative and to promote better understanding. It would be helpful to read this report in conjunction with the published assessment and marking instructions for the examination.

Section 1: Comments on the Assessment

Component 1: Question paper

It was pleasing to note the large increase in the number of candidates being presented at National 5 compared to Credit level Technological Studies last year.

The question paper was written by teachers with considerable experience of setting at Credit and Intermediate 2 levels in Technological Studies, and this helped to ensure that the assessment was on standard, with the full range of marks awarded in all questions.

An unfortunate error in the pneumatic circuit in question 12(b) resulted in a change to the Marking Instructions to ensure that no candidate was disadvantaged. Item Analysis and marker feedback confirmed that this was indeed the case.

The grade boundary was subsequently set at notional difficulty for all levels.

Section 2: Comments on candidate performance

Component 1: Question paper

The candidates were in general well prepared for the question paper, and there was no evidence to suggest weaker performance in the questions assessing 'new' content that had not previously been examined in Technological Studies.

There was nothing to indicate that candidates had particular difficulty transposing the formulae in the calculation-based questions.

It is worth noting that centres appeared to have entered candidates at the correct level and overall majority of the cohort received an award (A – D).

Section 3: Areas in which candidates performed well

Component 1: Question paper

Question 3(a): The majority of candidates identified the type of engineer responsible.

Question 5: The calculation of strain was well answered.

Question 10: The completion of the truth table from a logic diagram saw strong performance.

Question 15(a): The calculation of kinetic energy was well attempted.

Question 17(a): Identifying a free-body diagram was achieved by the majority candidates.

Section 4: Areas which candidates found demanding

Component 1: Question paper

Question 1: Identifying a sensor for the sub-system or adding an arrow to show the feedback nature of the loop was found to be challenging to some of the candidates.

Question 6: Some candidates overlooked the drawing of the symbol on the valve for main air and the diaphragm actuator.

Question 12(a): The position, orientation and correct symbol for the uni-directional restrictor to produce an adjustable delay seems to have been challenging for some candidates.

Question 16(a)(i): Some candidates found describing the operation of the voltage divider a challenge and tended to respond with simplistic statements.

Question 16(c): A number of candidates tended to answer this descriptive question with a simple statement such as 'compact'.

Question 16(e): This descriptive question saw some candidates respond with simple or one word answers such as 'lubricate'.

Section 5: Advice to centres for preparation of future candidates

Component 1: Question paper

Candidates should be directed to ensure that the correct units are included in all calculation final answers, where applicable. The Data Booklet lists N m^{-2} (Pa) as the unit for stress and pressure, but candidates would not be penalised if their final answer is given in millimetres provided they use N mm^{-2} rather than N m^{-2} (Pa).

The comments in a flowchart box must include the pin number, where applicable, and candidates should also be directed to refer to the Data Booklet for the correct symbols.

Some candidates seem to be unclear on the difference between 'state', 'describe' and 'explain' questions in terms of the length and detail of response. Centres may wish to ensure that candidates are guided, for example:

- ◆ 'State how the efficiency of a simple gear train could be improved' — an acceptable response would be 'lubricate'.
- ◆ 'Describe how the efficiency of a simple gear train could be improved' — an acceptable response would be 'lubricate the meshing gears with oil'.
- ◆ 'Explain how the efficiency of a simple gear train could be improved' — an acceptable response is 'lubricate the meshing gears with oil so that friction is reduced and less energy is lost to heat'.

In questions asking for a description of the function of a component or sub-system, candidates should be directed to ensure that the purpose is describe in the context set by the question, rather than as general features or characteristic. For example, 'the function of a diode in parallel with a relay is to protect a transistor from back emf' rather than 'allow current to flow in one direction'.

Statistical information: update on Courses

Number of resulted entries in 2013	0
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Number of resulted entries in 2014	1296
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Statistical information: Performance of candidates

Distribution of Course awards including grade boundaries

Distribution of Course awards	%	Cum. %	Number of candidates	Lowest mark
Maximum Mark 150				
A	42.8%	42.8%	555	105
B	21.5%	64.3%	278	90
C	17.1%	81.4%	222	75
D	6.4%	87.8%	83	67
No award	12.2%	-	158	-