

Examiners' Report/
Principal Examiner Feedback

Summer 2013

Principal Learning

Engineering
EG301 Paper 01

Investigating Engineering Business
and the Environment

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Unit EG301

Investigating Engineering Business and the Environment

General Comments

The entry size for the examination was lower during this series than in previous years, although the ability of students was similar to June 2012. The majority of students were able to demonstrate their knowledge of a range of engineering factors, although as in previous series there were some serious misunderstandings of both business and engineering concepts which continues to be a concern.

The paper is divided into three sections, section A which consists of 20 multiple choice questions, section B which is a variety of short and medium answer questions, and section C which is in the main long answer questions. The various Learning Outcomes are assessed across the three sections.

Section A

Question 1

Whilst in previous series students have been comfortable with the size of a typical SME, there was less awareness that a large business is classified as one which has over 250 employees.

Question 2

The majority of students were able to identify that the most appropriate method of production for soft drink cans would be continuous, although a significant proportion stated mass or batch.

Question 3

This question focuses on one of the various Acts of Parliament or pieces of legislation listed within LO4 of the specification. Approximately half of the students were able to correctly state that a fire certificate needs to be renewed every year, although a proportion of students suggested every 10 years as the correct time period.

Question 4

A small proportion of students were able to state that the balance of payments is a record of financial transactions between a country and the rest of the world. This is a concept which is explicitly named within the specification, and has been included in various forms in previous series. It is important that students at least know the definitions of such financial terms.

Question 5

Approximately half of the students knew that the payments against invoices were a form of income, with a significant proportion giving interest on bank loans as their response. This is however an example of expenditure.

Question 6

Most students were correctly able to identify the shown structure as hierarchical, which demonstrates good awareness of business structures.

Question 7

The majority of students were able to identify the information which would normally be expected to be found in the title block of an engineering drawing, which is encouraging.

Question 8

Students generally had a good understanding of the different engineering sectors. In this instance the chemical sector is responsible for working with unreacted raw materials and methods of purification. This was correctly identified by the majority of students, although a large minority suggested the nuclear sector.

Question 9

It was encouraging to see that the majority of students were aware of employee responsibilities according to the Health and Safety at Work Act.

Question 10

There was a low level of knowledge with regards to social trends, with approximately a quarter of students identifying that the ability to drive is not a social trend.

Question 11

Most students correctly identified that the link between unemployment and the economy would result in fewer sales of electronic products if unemployment were to increase.

Question 12

As is seen in other units, students tend to have low level awareness of critical path analysis and network diagrams in general. In this instance there was only one path which had any form of float, with 4 units of time being the float for the activities along the path B-F-K-N.

Question 13

The majority of students correctly identified that a marine engineer would not be concerned with issues relating to water quality. It is likely that some of the students who offered the incorrect answer did so due to not fully reading the question. It is important that questions are read in full prior to answering.

Question 14

Although the majority of students correctly identified biomass as a source of sustainable energy, there appeared to be some confusion with the difference between renewable and sustainable. A minority of students suggested nuclear which is neither of these.

Question 15

In general students have a lower understanding of financial terms than they do with factors relating to engineering sectors. This is reflected in this question where a little over a third of students were able to identify the contents of a budget plan.

Question 16

The majority of students identified that the ability of divisions to compete against each other is a disadvantage to a company.

Question 17

Students continue to perform reasonably well with the questions which involve calculations. In this instance the question asks for the value of the investments, therefore this is the initial sum plus compound interest over 6 years. Students who made errors either did so by stating only the interest earned, or the total value but without taking into account compound interest.

Question 18

Students showed a good understanding of the nature of a partnership, with the majority correctly identifying that the only activity which required the consent of all partners was to admit further members into the partnership.

Question 19

The contents of invoices was one area in which students showed a greater understanding of financial concepts. In this instance, a large number of students correctly stated the correct set of information.

Question 20

Whilst students are generally aware of the advantages of using computer based systems for work activities, the majority also demonstrated that they were aware of the limitations of using project planning software, with over 90% correctly stating that to make full use of the software requires high levels of training.

Section B

Question 21a

This question required students to identify two disadvantages of using PPE as a control measure for engineering activities. The majority of students were often able to state one, usually that it is often worn incorrectly or forgotten, with more able students suggesting that PPE does not offer total protection, it only protects individuals and can become a hazard in its own right if damaged. A full list is given in the mark scheme.

Question 21b

In response to this question, students tended to either score full marks or zero. Those students with an awareness of the difference between a hazard and a risk very often gave text book responses which were fully descriptive. There were however a number of students who lacked an awareness of this fundamental difference.

Question 22a

Many students gave one statement relating to renewable energy sources, however very few developed their answer into a description. Students can only gain full marks for a describe question if there is some development in their answers. Typical acceptable answers are given in the mark scheme.

Question 22b

It was encouraging that the majority of students were able to correctly state two renewable resources. These tended to focus on renewable energy sources, although a number of students made reference to materials. Where students did not gain full marks this was due to suggesting materials such as polymers, nuclear energy or metals.

Question 23a

As with other costing methods, student understanding of process costing was low. It is important that students at least have an awareness of each type of costing named in the specification, and are able to offer a definition of them. Suitable responses are given in the mark scheme.

Question 23b

Although understanding of costing is limited, students have a firmer understanding of the term expenditure, and in the majority of cases were able to give detailed descriptions of expenditure, often within an engineering context.

Question 24

The majority of students provided generic responses to this question, considering only the main considerations which would need to be made such as the training which the subcontractor has had or needs, and concerns regarding PPE. Very few went into detail to consider the experience and reputation of the subcontractor, or the extent of responsibilities in the workplace. Some students gave answers which implied the subcontractor as an individual, whilst others considered an entity. Either approach was acceptable.

Question 25

For full marks, students were expected to put forward both the advantages and disadvantages of operating as an owner-manager. In most instances, this was evident with more able students suggesting having full control of the business as an advantage and not having others to discuss issues with as a limitation. Some students who did not fully understand the concept suggested that the owner-manager answered to a manager or similar, whilst a common answer which gained one mark was that the owner-manager retained all profits. As with other discuss questions, points should be expanded upon to gain higher marks.

Section C

Question 26a

As has been seen previously, students in general lack the understanding of the business content which is required for this unit. This question required students to discuss the impacts of raising interest rates on an engineering business. Most students gained low marks by suggesting that loans would be more expensive and investments may earn more interest. Few students discussed the wider implications of increased interest rates which are given in the mark scheme.

Question 26bi and Question 26bii

The majority of students correctly plotted the break-even chart, with appropriate axes and the required information shown. Where students did not gain full marks, this would tend to be as a result of either using an inappropriate scale, transposing axes or simple plotting errors.

Question 26biii

Students knowledge of breakeven was in general very good. They tended to state that break even is where costs and revenue are equal or similar, and gained full marks. This question was typically either answered to gain full marks or zero.

Question 27

The majority of students who provided an answer to this question gave two specific activities related to manufacturing. Where students did not gain marks, this was as a result of suggesting 'making thing', 'producing products' or similarly vague answers which all related to manufacturing. Students were rewarded for stating specific processes such as milling, turning etc.

Question 28

It is concerning that students still hold some misconceptions regarding the Health and Safety Executive. It appears that some students continue to believe that the Health and Safety Executive is an employee of the specific engineering business, or that they are responsible for performing inspections and then producing risk assessments for a company.

Where students provided a good answer to this question, they made reference to using the resources for training purposes for staff or as models from which to develop their own resources. More able students made reference to case studies and how these can improve safety and that benchmarking can be used in comparison to similar businesses.

Grade Boundaries

Grade boundaries for this, and all other papers, can be found on the website on this link:

<http://www.edexcel.com/iwant to/Pages/grade-boundaries.aspx>

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