

Write your name here

Surname

Other names

**Edexcel  
Principal Learning**

Centre Number

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Candidate Number

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**Engineering**

**Level 3**

**Unit 1: Investigating Engineering Business and  
the Environment**

Wednesday 9 January 2013 – Afternoon

**Time: 1 hour 30 minutes**

Paper Reference

**EG301/01**

**You may use:**

Pen, pencil, eraser, calculator

Total Marks

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### Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided – *there may be more space than you need.*

### Information

- The total mark for this paper is 60.
- The marks for **each** question are shown in brackets – *use this as a guide as to how much time to spend on each question.*

### Advice

- Read each question carefully before you start to answer it.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

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Turn over ►

**PEARSON**

## SECTION A

Answer ALL questions.

In Section A, all questions must be answered with a cross . If you change your mind about an answer, put a line through the box  and then mark your new answer with a cross .

1 A micro business has fewer than how many employees?

A	10	<input type="checkbox"/>
B	25	<input type="checkbox"/>
C	50	<input type="checkbox"/>
D	75	<input type="checkbox"/>

(Total for Question 1 = 1 mark)

2 The amount which the sale of an individual item adds to the overall profit of an engineering business is referred to as:

A	expenses	<input type="checkbox"/>
B	debenture	<input type="checkbox"/>
C	incorporation	<input type="checkbox"/>
D	contribution	<input type="checkbox"/>

(Total for Question 2 = 1 mark)

3 The process of finding better ways to manufacture is known as:

A	engineering advancement	<input type="checkbox"/>
B	product development	<input type="checkbox"/>
C	technological change	<input type="checkbox"/>
D	engineering challenge	<input type="checkbox"/>

(Total for Question 3 = 1 mark)



4 Which type of organisation would have a board of governors?

A	Private	<input type="checkbox"/>
B	Public Limited Company	<input type="checkbox"/>
C	Not For Profit	<input type="checkbox"/>
D	Partnership	<input type="checkbox"/>

(Total for Question 4 = 1 mark)

5 Which **one** of the following is an advantage of outsourcing payroll services?

A	Reduced back office overheads	<input type="checkbox"/>
B	Reduced managerial control of staff	<input type="checkbox"/>
C	Long term contracts could be expensive	<input type="checkbox"/>
D	Competitors may gain inside information	<input type="checkbox"/>

(Total for Question 5 = 1 mark)

6 Which **one** of the following is **not** considered to be a job role in the construction sector?

A	Plasterer	<input type="checkbox"/>
B	Carpenter	<input type="checkbox"/>
C	Heating engineer	<input type="checkbox"/>
D	Electronics technician	<input type="checkbox"/>

(Total for Question 6 = 1 mark)

7 According to the Working Times Regulations (1998), how many hours must a person work before they are entitled to have a break?

A	4	<input type="checkbox"/>
B	6	<input type="checkbox"/>
C	8	<input type="checkbox"/>
D	10	<input type="checkbox"/>

(Total for Question 7 = 1 mark)



8 The business structure where decisions are made by a group of people is called:

A	hierarchical	<input type="checkbox"/>
B	matrix	<input type="checkbox"/>
C	committee	<input type="checkbox"/>
D	flat	<input type="checkbox"/>

(Total for Question 8 = 1 mark)

9 Which **one** of the following **best** describes a commissioning engineer's job?

A	Testing, evaluating, modifying and retesting products	<input type="checkbox"/>
B	Measuring performance of mechanical components	<input type="checkbox"/>
C	Using computer packages for developing detailed designs	<input type="checkbox"/>
D	Ensuring that equipment works to its specification	<input type="checkbox"/>

(Total for Question 9 = 1 mark)

10 Which **one** of the following is a requirement of **employers** under the Health and Safety at Work Act (1974)?

A	Report serious risks	<input type="checkbox"/>
B	Provide appropriate PPE	<input type="checkbox"/>
C	Cooperate with employees	<input type="checkbox"/>
D	Follow training and instructions	<input type="checkbox"/>

(Total for Question 10 = 1 mark)



11 What is marginal costing?

<b>A</b>	Calculating the cost of time, material and expenses for an individual job	<input type="checkbox"/>
<b>B</b>	Calculating the total of indirect and direct costs	<input type="checkbox"/>
<b>C</b>	Calculating the extra cost to make one more	<input type="checkbox"/>
<b>D</b>	Calculating the total unit cost of a continuous production run	<input type="checkbox"/>

(Total for Question 11 = 1 mark)

12 Figure 1 shows a circuit diagram.

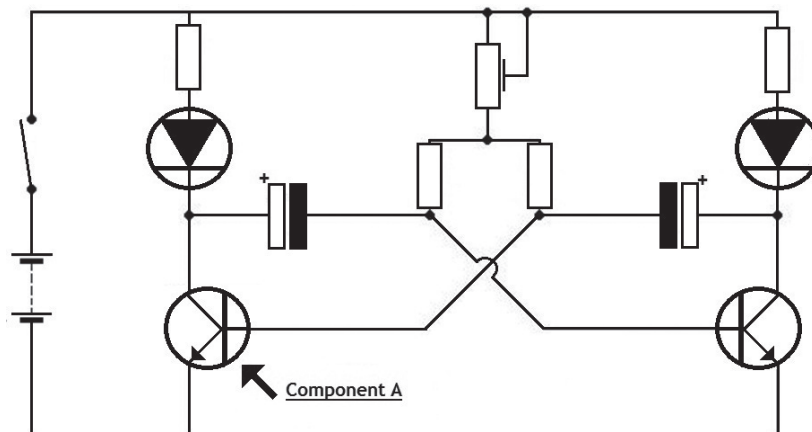


Figure 1

The symbol labelled Component A represents a:

<b>A</b>	transistor	<input type="checkbox"/>
<b>B</b>	transducer	<input type="checkbox"/>
<b>C</b>	thermistor	<input type="checkbox"/>
<b>D</b>	transformer	<input type="checkbox"/>

(Total for Question 12 = 1 mark)



13 Which **one** of the following is considered to be expenditure for a new fixed asset?

<b>A</b>	Charges paid on loans from a bank	<input type="checkbox"/>
<b>B</b>	Money paid to buy plant and equipment	<input type="checkbox"/>
<b>C</b>	Commission paid out to sales team	<input type="checkbox"/>
<b>D</b>	Costs incurred for repairing machinery	<input type="checkbox"/>

(Total for Question 13 = 1 mark)

14 Which **one** of the following is a **by-product** of the oil industry?

<b>A</b>	Gypsum	<input type="checkbox"/>
<b>B</b>	Fly ash	<input type="checkbox"/>
<b>C</b>	Molasses	<input type="checkbox"/>
<b>D</b>	Asphalt	<input type="checkbox"/>

(Total for Question 14 = 1 mark)

15 According to the Electricity at Work Regulations (1989), what is the voltage of a single phase public electricity supply?

<b>A</b>	110V	<input type="checkbox"/>
<b>B</b>	230V	<input type="checkbox"/>
<b>C</b>	400V	<input type="checkbox"/>
<b>D</b>	1000V	<input type="checkbox"/>

(Total for Question 15 = 1 mark)

16 The total value of all goods and services produced in a country, including investments from the government and net exports, is called:

<b>A</b>	Gross Domestic Product	<input type="checkbox"/>
<b>B</b>	Gross National Product	<input type="checkbox"/>
<b>C</b>	Balance of Payments	<input type="checkbox"/>
<b>D</b>	Balance of Trade	<input type="checkbox"/>

(Total for Question 16 = 1 mark)



17 According to the Management of Health and Safety at Work Regulations (1999), a young person is allowed to work in which **one** of the following conditions?

<b>A</b>	Extreme high temperature	<input type="checkbox"/>
<b>B</b>	High levels of noise	<input type="checkbox"/>
<b>C</b>	Low level radiation	<input type="checkbox"/>
<b>D</b>	Exposure to vibration	<input type="checkbox"/>

(Total for Question 17 = 1 mark)

18 A telecommunications engineer invests £1 200 on new testing equipment.

The value of the equipment depreciates by 15% each year.

After how many years will it be worth less than half of the initial cost?

<b>A</b>	3	<input type="checkbox"/>
<b>B</b>	4	<input type="checkbox"/>
<b>C</b>	5	<input type="checkbox"/>
<b>D</b>	6	<input type="checkbox"/>

(Total for Question 18 = 1 mark)

19 A product specification is **best** described as:

<b>A</b>	a table which shows a range of information about only the materials required for an engineering activity	<input type="checkbox"/>
<b>B</b>	a set of instructions which are used to carry out activities that are repeated daily	<input type="checkbox"/>
<b>C</b>	a document which includes only drawings that can be used to assemble a series of components	<input type="checkbox"/>
<b>D</b>	a document which sets out the requirements of a component including materials, dimensions and tolerances	<input type="checkbox"/>

(Total for Question 19 = 1 mark)



**20** An engineering company should always instruct staff of safe working procedures for which **one** of the following groups of conditions?

<b>A</b>	<ul style="list-style-type: none"><li>• Introducing a new quality control activity</li><li>• Changing a job or task</li><li>• Employing a new supervisor</li></ul>	<input type="checkbox"/>
<b>B</b>	<ul style="list-style-type: none"><li>• Developing a new job or task</li><li>• Changing a job or task</li><li>• Introducing new workshop equipment</li></ul>	<input type="checkbox"/>
<b>C</b>	<ul style="list-style-type: none"><li>• Developing a manufacturing activity</li><li>• Changing working hours</li><li>• Introducing new workshop equipment</li></ul>	<input type="checkbox"/>
<b>D</b>	<ul style="list-style-type: none"><li>• Developing a new job or task</li><li>• Repainting the workshop floor</li><li>• Replacing like-for-like workshop equipment</li></ul>	<input type="checkbox"/>

**(Total for Question 20 = 1 mark)**

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**TOTAL FOR SECTION A = 20 MARKS**





**SECTION B**

**21** Describe what is meant by a **prototype**.

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**(Total for Question 21 = 3 marks)**

**22** Outline the key features of the Control of Noise at Work Regulations (2005).

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**(Total for Question 22 = 4 marks)**



**23** Give **three** ways in which the location of an engineering business can impact the local economy.

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**(Total for Question 23 = 3 marks)**

**24** Describe **two** methods which can be used to ensure that members of the public can be protected from hazards when visiting an engineering workshop.

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2 .....

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**(Total for Question 24 = 4 marks)**



**25** (a) When considering product manufacture, outline what is meant by the term 'Make or Buy'.

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(b) Explain why a standing plan may be used for an engineering project.

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**(Total for Question 25 = 6 marks)**

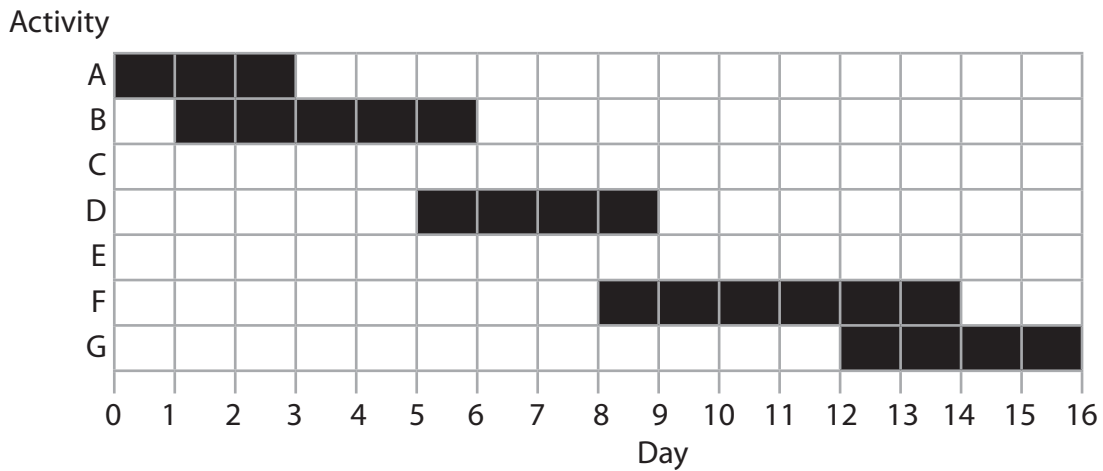
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**TOTAL FOR SECTION B = 20 MARKS**



### SECTION C

26 Figure 2 shows a Gantt chart.



**Figure 2**

The table below shows some information which is needed to complete the Gantt chart.

- It shows how long activities C and E should take to complete
- Any special conditions which apply to the start or finish day of the activity

Activity	Duration	Conditions
<b>C</b>	5 days	Activity <b>B</b> must be completed.
<b>E</b>	2 days	Must begin immediately after activity <b>D</b> finishes.

(a) Complete the Gantt chart in Figure 2 to show these activities. (2)

(b) Explain the advantage of using a Gantt chart for the day-to-day management of an engineering project. (3)

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**(Total for Question 26 = 5 marks)**





**28** (a) The Control of Substances Hazardous to Health Regulations (2002) states a range of methods to ensure a safe workplace.

Explain how an engineering company can use substance control to assist with maintaining a safe workplace.

(4)

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