

Write your name here

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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**

Thursday 23 May 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.

Turn over ►

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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 large business has at least how many employees?

A	250	<input type="checkbox"/>
B	500	<input type="checkbox"/>
C	750	<input type="checkbox"/>
D	1000	<input type="checkbox"/>

(Total for Question 1 = 1 mark)

2 Which level of production would be **most** appropriate for the manufacture of soft drink cans?

A	Job	<input type="checkbox"/>
B	Batch	<input type="checkbox"/>
C	Mass	<input type="checkbox"/>
D	Continuous	<input type="checkbox"/>

(Total for Question 2 = 1 mark)

3 According to the Fire Precautions Act (1971), a fire certificate should be renewed every:

A	month	<input type="checkbox"/>
B	year	<input type="checkbox"/>
C	5 years	<input type="checkbox"/>
D	10 years	<input type="checkbox"/>

(Total for Question 3 = 1 mark)



4 The record of all financial transactions between a country and the rest of the world is known as:

A	global economy	<input type="checkbox"/>
B	gross domestic product	<input type="checkbox"/>
C	gross national product	<input type="checkbox"/>
D	balance of payments	<input type="checkbox"/>

(Total for Question 4 = 1 mark)

5 One form of income received by an engineering business is:

A	charges a sub-contractor makes	<input type="checkbox"/>
B	interest on bank loans	<input type="checkbox"/>
C	payment against client invoices	<input type="checkbox"/>
D	charges for new equipment	<input type="checkbox"/>

(Total for Question 5 = 1 mark)

6

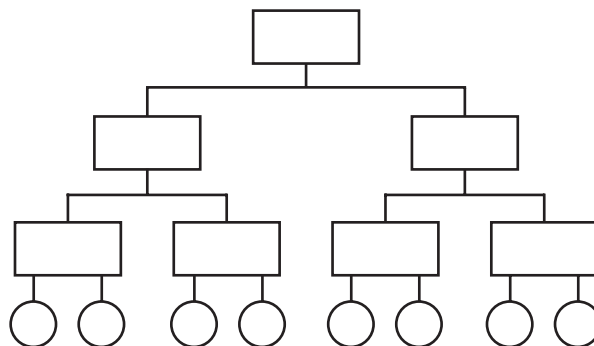


Figure 1

Figure 1 shows an example of which type of business structure?

A	Matrix	<input type="checkbox"/>
B	Hierarchical	<input type="checkbox"/>
C	Flat	<input type="checkbox"/>
D	Network	<input type="checkbox"/>

(Total for Question 6 = 1 mark)



7 The title block of an engineering drawing should contain which **one** of the following sets of information?

A	<ul style="list-style-type: none">• Size of paper• Date of issue• Scale of drawing	<input type="checkbox"/>
B	<ul style="list-style-type: none">• Size of paper• Drawing number• Scale of drawing	<input type="checkbox"/>
C	<ul style="list-style-type: none">• Drawing number• Size of paper• Date of issue	<input type="checkbox"/>
D	<ul style="list-style-type: none">• Drawing number• Date of issue• Scale of drawing	<input type="checkbox"/>

(Total for Question 7 = 1 mark)

8 Which engineering sector is associated with unreacted raw materials and methods of purification?

A	Chemical	<input type="checkbox"/>
B	Water services	<input type="checkbox"/>
C	Civil	<input type="checkbox"/>
D	Nuclear technologies	<input type="checkbox"/>

(Total for Question 8 = 1 mark)

9 Which **one** of the following is solely the responsibility of an **employee** under the Health and Safety at Work Act (1974)?

A	Supervision of visitors	<input type="checkbox"/>
B	Providing a first aid box	<input type="checkbox"/>
C	Being responsible for their own safety	<input type="checkbox"/>
D	Making sure that machinery is maintained	<input type="checkbox"/>

(Total for Question 9 = 1 mark)



10 Which **one** of the following is **not** considered to be a social trend?

A	Ability to drive	<input type="checkbox"/>
B	Education and training	<input type="checkbox"/>
C	Income and wealth	<input type="checkbox"/>
D	Personal health	<input type="checkbox"/>

(Total for Question 10 = 1 mark)

11 A company which sells MP3 players will be affected by a national rise in unemployment because:

A	sales will increase	<input type="checkbox"/>
B	sales will decrease	<input type="checkbox"/>
C	fixed costs will increase	<input type="checkbox"/>
D	fixed costs will decrease	<input type="checkbox"/>

(Total for Question 11 = 1 mark)

12 Figure 2 shows a network diagram for an engineering project.

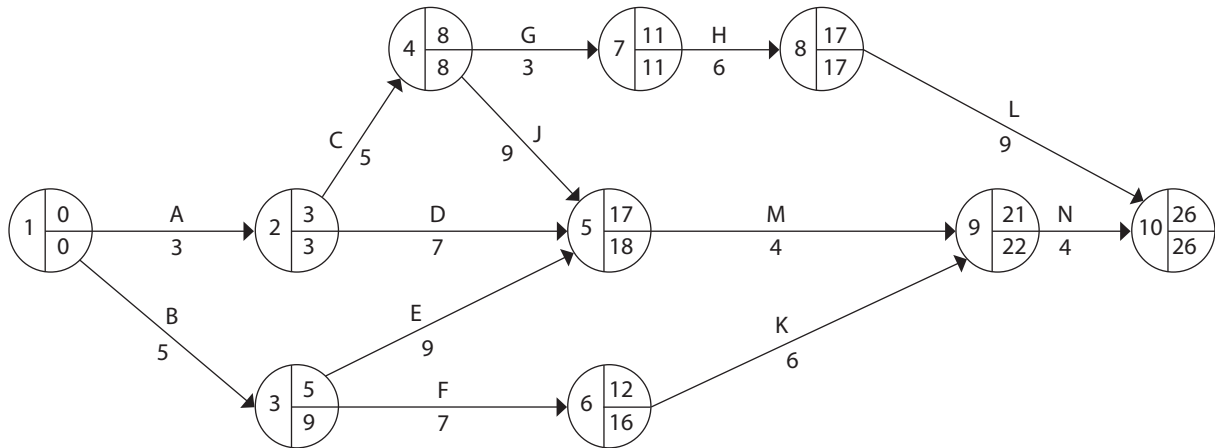


Figure 2

Which activities form the path with the greatest amount of float?

A	A-C-G-H-L	<input type="checkbox"/>
B	A-C-J-M-N	<input type="checkbox"/>
C	B-E-M-N	<input type="checkbox"/>
D	B-F-K-N	<input type="checkbox"/>

(Total for Question 12 = 1 mark)



13 The role of a marine engineer would **not** include which **one** of the following?

A	Testing offshore platforms	<input type="checkbox"/>
B	Maintaining ships	<input type="checkbox"/>
C	Checking water quality	<input type="checkbox"/>
D	Designing submarines	<input type="checkbox"/>

(Total for Question 13 = 1 mark)

14 **One** example of a sustainable energy source is:

A	paraffin	<input type="checkbox"/>
B	biomass	<input type="checkbox"/>
C	ethanol	<input type="checkbox"/>
D	nuclear	<input type="checkbox"/>

(Total for Question 14 = 1 mark)

15 Which **one** of the following sets of information should be found in a budget plan?

A	<ul style="list-style-type: none">• Cash flow forecast• Investments in equipment• Sales forecasts	<input type="checkbox"/>
B	<ul style="list-style-type: none">• Cash flow forecast• Sales forecasts• Investment appraisal	<input type="checkbox"/>
C	<ul style="list-style-type: none">• Investments in equipment• Sales forecasts• Investment appraisal	<input type="checkbox"/>
D	<ul style="list-style-type: none">• Cash flow forecast• Investments in equipment• Investment appraisal	<input type="checkbox"/>

(Total for Question 15 = 1 mark)



16 Which **one** of the following is a **disadvantage** of a company adopting a divisional structure?

A	Greater response to local customer needs	<input type="checkbox"/>
B	Divisions are able to compete with each other	<input type="checkbox"/>
C	Operations are able to be more specialised	<input type="checkbox"/>
D	Trading names are more familiar to markets	<input type="checkbox"/>

(Total for Question 16 = 1 mark)

17 An engineer invests £5 000 into a bank account which pays a high rate of interest. The bank pays 4.5% interest per year. How much is the investment worth after 6 years?

A	£1 350.00	<input type="checkbox"/>
B	£1 511.30	<input type="checkbox"/>
C	£6 350.00	<input type="checkbox"/>
D	£6 511.30	<input type="checkbox"/>

(Total for Question 17 = 1 mark)

18 For which activity does a partner in a business need the consent of **all** of the other partners?

A	Buy and sell goods on behalf of the business	<input type="checkbox"/>
B	Give security of land or buildings against loans	<input type="checkbox"/>
C	Receive payments of debts outstanding and issue receipts	<input type="checkbox"/>
D	Admit another member into the partnership	<input type="checkbox"/>

(Total for Question 18 = 1 mark)



19 Which **one** of the following sets of information should be included in a sales invoice?

A	<ul style="list-style-type: none"> • Reference number • Date of sale • Description of product • Cost of packaging 	<input type="checkbox"/>
B	<ul style="list-style-type: none"> • Seller's name • Date of delivery • Description of product • Cost of packaging 	<input type="checkbox"/>
C	<ul style="list-style-type: none"> • Reference number • Date of delivery • Description of product • Total amount charged 	<input type="checkbox"/>
D	<ul style="list-style-type: none"> • Customer's name • Website address • Description of product • Total amount charged 	<input type="checkbox"/>

(Total for Question 19 = 1 mark)

20 Which **one** of the following is a **disadvantage** of using project planning software for managing an engineering activity?

A	Software allows for projects to be updated taking account of delays or early completion of activities	<input type="checkbox"/>
B	High level aspects of the software require comprehensive training in order to be used effectively	<input type="checkbox"/>
C	Can be used to compare the progress of a project to that made on a previous similar project	<input type="checkbox"/>
D	Engineers can work in collaboration with each other in order to make sure that plans are effective	<input type="checkbox"/>

(Total for Question 20 = 1 mark)

TOTAL FOR SECTION A = 20 MARKS



SECTION B

21 (a) State **two** disadvantages of using PPE as a control measure.

(2)

- 1
- 2

(b) Outline the difference between a hazard and a risk.

(2)

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-
-
-

(Total for Question 21 = 4 marks)

22 (a) Describe what is meant by a **renewable resource**.

(2)

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-
-

(b) Give **two** examples of renewable resources.

(2)

- 1
- 2

(Total for Question 22 = 4 marks)



23 (a) Describe the term **process costing**.

(2)

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(b) Describe the term **expenditure**.

(2)

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(Total for Question 23 = 4 marks)

24 Outline the health and safety considerations a company should make before employing a subcontractor to work on an engineering project.

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(Total for Question 24 = 4 marks)



25 Discuss the benefits and limitations of operating as an owner-manager.

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(Total for Question 25 = 4 marks)

TOTAL FOR SECTION B = 20 MARKS



SECTION C

26 (a) Discuss the impacts on a UK engineering business if the Bank of England raises interest rates.

(6)

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(b) (i) Using suitably labelled axes, produce a break-even chart in Figure 3 for the data in Table 1.

Number sold	0	50	100	150	200	250
Fixed cost	£1 500	£1 500	£1 500	£1 500	£1 500	£1 500
Variable cost	£0	£250	£500	£750	£1 000	£1 250
Total cost	£1 500	£1 750	£2 000	£2 250	£2 500	£2 750
Total revenue	£0	£750	£1 500	£2 250	£3 000	£3 750

Table 1

(2)

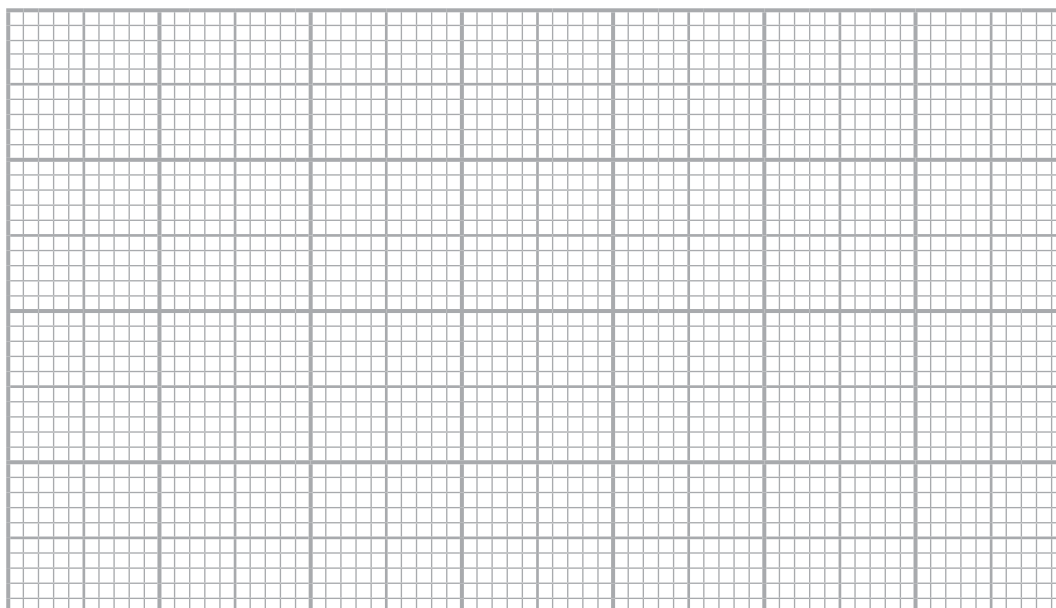


Figure 3

(ii) On your chart label the following features:

- Fixed costs
- Variable costs

(2)

(iii) Describe what is meant by **break-even point**.

(2)

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(Total for Question 26 =12 marks)



27 State **two** specific activities undertaken by the manufacturing function of an engineering business.

1

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2

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(Total for Question 27 = 2 marks)

28 Discuss how an engineering business can make use of the Health and Safety Executive's (HSE) guidance notes and booklets to improve safety in the workplace.

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(Total for Question 28 = 6 marks)

TOTAL FOR SECTION C = 20 MARKS
TOTAL FOR PAPER = 60 MARKS



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