

Write your name here			
Surname		Other names	
Edexcel Principal Learning	Centre Number	Candidate Number	
	<input type="text"/>	<input type="text"/>	<input type="text"/>
Engineering			
Level 3			
Unit 1: Investigating Engineering Business and the Environment			
Tuesday 25 May 2010 – Afternoon		Paper Reference	
Time: 1 hour 30 minutes		EG301/01	
You must have: Calculator			Total Marks

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 ►

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Answer ALL questions.

SECTION A

In Section A questions must be answered with a cross in a box ☒. 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 fresh water treatment plant would be designed by a company from which engineering sector?

A	Marine	<input type="checkbox"/>
B	Water services	<input type="checkbox"/>
C	Waste management	<input type="checkbox"/>
D	Building services	<input type="checkbox"/>

(Total for Question 1 = 1 mark)

2 An engineering company would prefer to employ new staff who:

A	enjoy working in factories	<input type="checkbox"/>
B	have the necessary skills	<input type="checkbox"/>
C	have large families	<input type="checkbox"/>
D	have no engineering experience	<input type="checkbox"/>

(Total for Question 2 = 1 mark)

3 Which **one** of the following project planning methods indicate a critical path?

A	Gantt chart	<input type="checkbox"/>
B	Design structure matrix	<input type="checkbox"/>
C	RACI diagram	<input type="checkbox"/>
D	Activity network diagram	<input type="checkbox"/>

(Total for Question 3 = 1 mark)



4 According to the Personal Protective Equipment at Work Regulations (2002), which of the following would be suitable for use where there is the hazard of falling objects?

A	Boiler suit and gloves	<input type="checkbox"/>
B	Hi-viz jacket and goggles	<input type="checkbox"/>
C	Helmet and safety boots	<input type="checkbox"/>
D	Bump cap and face shield	<input type="checkbox"/>

(Total for Question 4 = 1 mark)

5 A design engineer would be responsible for:

A	producing work schedules and plans	<input type="checkbox"/>
B	organising publicity and advertising	<input type="checkbox"/>
C	installing and maintaining plant	<input type="checkbox"/>
D	producing drawings of structural details	<input type="checkbox"/>

(Total for Question 5 = 1 mark)

6 Which **one** of the following costing methods would be most suitable for producing a unique, one-off product?

A	Marginal costing	<input type="checkbox"/>
B	Process costing	<input type="checkbox"/>
C	Job costing	<input type="checkbox"/>
D	Parts costing	<input type="checkbox"/>

(Total for Question 6 = 1 mark)

7 In financial terms, contribution is the sales revenue of a product:

A	minus initial outlay	<input type="checkbox"/>
B	minus variable costs	<input type="checkbox"/>
C	minus fixed costs	<input type="checkbox"/>
D	minus all costs	<input type="checkbox"/>

(Total for Question 7 = 1 mark)



8 Which **one** of the following vehicles would **not** be produced by an automotive manufacturer?

A	Tramcar	<input type="checkbox"/>
B	Public Service Vehicle	<input type="checkbox"/>
C	Heavy Goods Vehicle	<input type="checkbox"/>
D	Motorcycle	<input type="checkbox"/>

(Total for Question 8 = 1 mark)

9 The board of directors in a large company is responsible for:

A	sending invoices to other companies	<input type="checkbox"/>
B	acting in good faith, for the success of the company	<input type="checkbox"/>
C	accepting benefits from third parties	<input type="checkbox"/>
D	the day-to-day operational activities	<input type="checkbox"/>

(Total for Question 9 = 1 mark)

10 A priority activity is a task which:

A	would have no consequences if it was moved back to a later date	<input type="checkbox"/>
B	is easy and can be done quickly, but at any time	<input type="checkbox"/>
C	will keep the business busy without increasing income	<input type="checkbox"/>
D	will have an effect on progress if incomplete	<input type="checkbox"/>

(Total for Question 10 = 1 mark)



11 Which **one** of the following is a major factor in investment appraisal?

A	Cost of tooling	<input type="checkbox"/>
B	Risk and return	<input type="checkbox"/>
C	Overhead costs	<input type="checkbox"/>
D	Workforce size	<input type="checkbox"/>

(Total for Question 11 = 1 mark)

12 Building services engineers would be responsible for:

A	measuring and sampling building materials to check their quality	<input type="checkbox"/>
B	designing product manufacturing processes that use new materials	<input type="checkbox"/>
C	assessing the energy efficiency and environmental impact of buildings	<input type="checkbox"/>
D	installing and repairing surface water drainage systems for motorways	<input type="checkbox"/>

(Total for Question 12 = 1 mark)

13 A charitable company is one which does **not**:

A	benefit from tax exemption	<input type="checkbox"/>
B	have a number of shareholders	<input type="checkbox"/>
C	operate on a non-profit basis	<input type="checkbox"/>
D	work for the benefit of others	<input type="checkbox"/>

(Total for Question 13 = 1 mark)



14 Production capacity is:

A	the size of the factory where engineered products are made	<input type="checkbox"/>
B	the number of products produced in a given time period, using current resources	<input type="checkbox"/>
C	the size of the individual products made in a factory	<input type="checkbox"/>
D	the number of products which are produced within given tolerances	<input type="checkbox"/>

(Total for Question 14 = 1 mark)

15 Absorption costing is a method of calculating the price of a product where:

A	every product is sold at a price which covers all of its costs, including overheads	<input type="checkbox"/>
B	the selling price covers only the cost of parts and components	<input type="checkbox"/>
C	the cost of each manufacturing process is allocated to products	<input type="checkbox"/>
D	the aggregate costs change if the output volume changes	<input type="checkbox"/>

(Total for Question 15 = 1 mark)



16 According to the Employment Equality (Age) Regulations 2006, an employee should expect to:

A	receive improved benefits, training and promotion prospects compared to other employees	<input type="checkbox"/>
B	not receive redundancy payments once they have reached the age of 65	<input type="checkbox"/>
C	be allowed to perform any job no matter what their age is, irrespective of any other law	<input type="checkbox"/>
D	be treated equally when setting work objectives or measuring levels of performance	<input type="checkbox"/>

(Total for Question 16 = 1 mark)

17 Which **one** of the following is a reason for **not** providing health and safety training in an engineering workplace?

A	Young employees are more likely to have accidents, so their training should be a priority	<input type="checkbox"/>
B	All staff should understand the health and safety policy and how health and safety is managed	<input type="checkbox"/>
C	Everyone needs to know how to work safely and without risks to health	<input type="checkbox"/>
D	Experienced employees are able to use all equipment without further specific training	<input type="checkbox"/>

(Total for Question 17 = 1 mark)



18 One method of controlling resources in a manufacturing business is to operate a 'Just in Time' system. One disadvantage of this is:

A	the entire manufacturing process becomes less efficient	<input type="checkbox"/>
B	holdups in the delivery of parts and components can halt production	<input type="checkbox"/>
C	suppliers deliver components to the production line as they are needed	<input type="checkbox"/>
D	there is less need for the company to hold a vast inventory of components	<input type="checkbox"/>

(Total for Question 18 = 1 mark)

19 A small engineering business borrows £10 000 from a bank to buy a delivery van.

Monthly payments of £200 will repay the loan with interest over five years.

How much will the company have paid the bank **in interest** after five years.

A	£200	<input type="checkbox"/>
B	£2 000	<input type="checkbox"/>
C	£2 400	<input type="checkbox"/>
D	£12 000	<input type="checkbox"/>

(Total for Question 19 = 1 mark)



20 Which one of the following is **not** required by The Provision and Use of Work Equipment Regulations (PUWER) 1999?

A	Provide instruction and guidance for the general public for the use of compressed air supplies on petrol station forecourts and similar locations	<input type="checkbox"/>
B	Equipment is inspected by a competent person to ensure that it is safe for use. A record must be kept until the next inspection	<input type="checkbox"/>
C	Provide suitable guards, protection devices, emergency stop buttons and personal protective equipment	<input type="checkbox"/>
D	Ensure that where mobile work equipment is used for carrying people, it is suitable for this purpose, and does not put people at risk	<input type="checkbox"/>

(Total for Question 20 = 1 mark)

TOTAL FOR SECTION A = 20 MARKS



SECTION B

21 Outline **three** reasons why an engineering company should implement a budget plan.

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(Total for Question 21 = 3 marks)

22 Describe the role of the production planning and control function within an engineering company.

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(Total for Question 22 = 3 marks)

23 Explain the following terms:

Gross Domestic Product (GDP)

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Fixed Cost

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(Total for Question 23 = 4 marks)



24 Business systems can often be explained using flow charts.

(a) In the space below, sketch a flow chart to represent a closed-loop system.

(3)

(b) Explain **one** advantage of a closed-loop system over an open-loop system.

(2)

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(Total for Question 24 = 5 marks)



25 An engineering company buys transistors to be used in the manufacture of its products. The stocking policy is to replenish the stock to maximum levels at the end of each month.

Figure 1 shows an extract from a stock control chart.

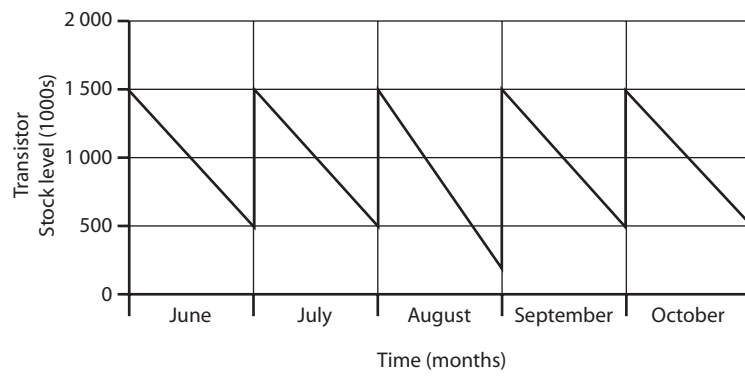


Figure 1

(a) Using Figure 1, how many transistors were received in to stock at the end of June? (1)

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(b) What does the diagram suggest about production in the month of August? (1)

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(c) Suggest the consequences for the company if the September delivery of transistors had been five weeks late. (3)

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(Total for Question 25 = 5 marks)

TOTAL SECTION B = 20 MARKS



SECTION C

26 In an engineering workshop, there are often a number of fixed and portable electrical tools.

According to the Electricity at Work Regulations (1992), there are a number of control measures which can be used to reduce the risk of injury from electrical equipment.

Describe, for both portable and fixed equipment, how the risk of injury can be reduced.

Portable Equipment

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Fixed Equipment

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(Total for Question 26 = 6 marks)



27 An engineering company has constructed a new distribution centre near a major motorway interchange that has links to both north-south and east-west routes.

(a) Discuss the environmental impact of the company locating its distribution centre close to a motorway interchange.

(6)

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(b) The company intends to use sustainable fuels to power vehicles.

Discuss the advantages and disadvantages of using sustainable fuels.

(8)

(Total for Question 27 = 14 marks)

TOTAL FOR SECTION C = 20 MARKS

TOTAL FOR PAPER = 60 MARKS



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