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**SECTION A**

**The questions in this section 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. An engineering company designs and manufactures wind-up chargers for mobile phones.  
Which two engineering sectors does this product belong to?

A	Electrical and chemical	<input checked="" type="checkbox"/>
B	Mechanical and civil	<input checked="" type="checkbox"/>
C	Electrical and mechanical	<input type="checkbox"/>
D	Telecommunications and civil	<input type="checkbox"/>

Q1

(Total 1 mark)

2. An engineering company produces bespoke equipment used in the soft drink canning industry. What production method would be used to manufacture this type of equipment?

A	One-off	<input checked="" type="checkbox"/>
B	Batch	<input checked="" type="checkbox"/>
C	Continuous/flow	<input type="checkbox"/>
D	High volume/mass	<input type="checkbox"/>

Q2

(Total 1 mark)



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3. A UK business which has multiple shareholders but is not quoted on the Stock Exchange is referred to as:

A	a sole trader	<input type="checkbox"/>
B	a private (Ltd) company	<input type="checkbox"/>
C	public (Plc)	<input type="checkbox"/>
D	not for profit	<input type="checkbox"/>

Q3

(Total 1 mark)

4. Which of the following functions within an engineering company would be responsible for ensuring stock levels are maintained?

A	Maintenance	<input type="checkbox"/>
B	Technical support	<input type="checkbox"/>
C	Quality assurance	<input type="checkbox"/>
D	Materials supply and control	<input type="checkbox"/>

Q4

(Total 1 mark)



3

Turn over

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5. Detailed information concerning the dimensional requirements of an engineered component would be found in the:

A	specification	<input checked="" type="checkbox"/>
B	operations sheet	<input checked="" type="checkbox"/>
C	materials requisition	<input checked="" type="checkbox"/>
D	bill of works	<input checked="" type="checkbox"/>

Q5

(Total 1 mark)

6. Which of the following would **not** be within the remit of the research and development department in an engineering company?

A	Investigating the applications of new discoveries	<input checked="" type="checkbox"/>
B	Keeping customer records up to date	<input checked="" type="checkbox"/>
C	Improving product performance	<input checked="" type="checkbox"/>
D	Responding to client feedback	<input checked="" type="checkbox"/>

Q6

(Total 1 mark)



7. Which of the following are considered to be indirect costs?

A	Materials	<input checked="" type="checkbox"/>
B	Operator wages	<input checked="" type="checkbox"/>
C	Distribution	<input checked="" type="checkbox"/>
D	Light and heat	<input checked="" type="checkbox"/>

(Total 1 mark)

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Q7



H 3 5 7 5 5 A 0 5 2 4

5

Turn over

Leave blank

8. Major engineering businesses are required by law to have a fire certificate under the Fire Precautions Act 1971. Which of the following **must** be on the fire certificate?

A	<ul style="list-style-type: none"><li>• Use of premises</li><li>• Means of escape</li><li>• Method of fire fighting</li></ul>	<input type="checkbox"/>
B	<ul style="list-style-type: none"><li>• Use of premises</li><li>• Method of fire fighting</li><li>• Age of employees</li></ul>	<input type="checkbox"/>
C	<ul style="list-style-type: none"><li>• Operational hours</li><li>• Method of fire fighting</li><li>• Means of escape</li></ul>	<input type="checkbox"/>
D	<ul style="list-style-type: none"><li>• Means of escape</li><li>• Maximum number of occupants</li><li>• Operational hours</li></ul>	<input type="checkbox"/>

Q8

(Total 1 mark)



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9. Which of the following describes a country's balance of payments?

A	Ensuring that there is an equal amount paid to everybody.	<input type="checkbox"/>
B	Making sure that profit and loss are equal.	<input type="checkbox"/>
C	The difference between visible imports and exports and invisible earnings.	<input type="checkbox"/>
D	The difference between the money coming into the country and that going out.	<input type="checkbox"/>

(Total 1 mark)

Q9



H 3 5 7 5 5 A 0 7 2 4

7

Turn over

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10. According to the HSE's First Aid at Work guidance, which of the following should **not** be kept in a first aid box?

A	Triangular bandage	<input type="checkbox"/>
B	Aspirin	<input type="checkbox"/>
C	Disposable gloves	<input type="checkbox"/>
D	Self-adhesive dressings	<input type="checkbox"/>

Q10

(Total 1 mark)

11. Which of the following personal protective equipment would be appropriate for environments where there are dust and chemical vapour hazards?

A	Visor and respirator	<input type="checkbox"/>
B	Gloves and breathing apparatus	<input type="checkbox"/>
C	Boiler suit and safety boots	<input type="checkbox"/>
D	Safety boots and face shield	<input type="checkbox"/>

Q11

(Total 1 mark)





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12. Which of the following can be used many times and is unaffected by environmental change?

A	Project plan	<input checked="" type="checkbox"/>
B	Standing plan	<input checked="" type="checkbox"/>
C	Forecast plan	<input checked="" type="checkbox"/>
D	Development plan	<input checked="" type="checkbox"/>

Q12

(Total 1 mark)

13. When purchasing new capital equipment, which of the following would **not** be a major consideration?

A	Machine reliability	<input checked="" type="checkbox"/>
B	Value for money	<input checked="" type="checkbox"/>
C	Running cost	<input checked="" type="checkbox"/>
D	Country of manufacture	<input checked="" type="checkbox"/>

Q13

(Total 1 mark)



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14. An engineering company employs technical sales staff. Which of the following would **not** be part of their job?

A	Analysing costs	<input type="checkbox"/>
B	Checking progress of orders	<input type="checkbox"/>
C	Calculating client quotations	<input type="checkbox"/>
D	Delivering equipment	<input type="checkbox"/>

Q14

(Total 1 mark)

15. Which of the following would be considered to be internal communication within a company?

A	Material requisition	<input type="checkbox"/>
B	Annual report	<input type="checkbox"/>
C	Letter to client	<input type="checkbox"/>
D	Press release	<input type="checkbox"/>

Q15

(Total 1 mark)



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16. Which of the following would **not** be a suitable form of maintenance for the energy source in a nuclear power station?

A	Predictive	<input type="checkbox"/>
B	Reactive	<input type="checkbox"/>
C	Preventative	<input type="checkbox"/>
D	Diagnostic	<input type="checkbox"/>

Q16

(Total 1 mark)

17. The purchase cost of a piece of workshop machinery is £60 000.  
The machinery depreciates by 10% per year.

What is the value of the machinery after three years?

A	£51 300	<input type="checkbox"/>
B	£43 740	<input type="checkbox"/>
C	£42 000	<input type="checkbox"/>
D	£40 680	<input type="checkbox"/>

Q17

(Total 1 mark)



Leave blank

18. Which of the following is the most harmful by-product of electricity generation in a coal fired power station?

A	Water vapour	<input type="checkbox"/>
B	Mercury	<input type="checkbox"/>
C	Fly ash	<input type="checkbox"/>
D	Heat	<input type="checkbox"/>

Q18

(Total 1 mark)

19. Which of the following products would **not** be manufactured by a company in the aerospace engineering sector?

A	Satellites	<input type="checkbox"/>
B	Missiles	<input type="checkbox"/>
C	Space vehicles	<input type="checkbox"/>
D	Ball bearings	<input type="checkbox"/>

Q19

(Total 1 mark)



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20. Noise can be very dangerous in a workplace.  
If people need to shout in order to be heard at a distance of approximately 2 metres, which  
of the following is required?

A	Take no action	<input checked="" type="checkbox"/>
B	A noise assessment should be carried out	<input checked="" type="checkbox"/>
C	Entire workforce must wear ear defenders	<input checked="" type="checkbox"/>
D	Send everybody home	<input checked="" type="checkbox"/>

Q20

(Total 1 mark)

**TOTAL FOR SECTION A: 20 MARKS**



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**SECTION B**

**Answer ALL the questions. Write your answers in the spaces provided.**

**21.** Outline **two** responsibilities of the **employer** under the Health and Safety at Work Act 1974.

- 1 .....
- .....
- 2 .....
- .....

**(Total 2 marks)**

**Q21**

**22.** Planning is an important part of all engineering operations.

Identify **four** types of information which are needed in order to produce a production plan.

- 1 .....
- 2 .....
- 3 .....
- 4 .....

**(Total 4 marks)**

**Q22**

**23.** Give **two** examples for each of the following financial terms.

- (a) Income .....
- .....
- .....
- .....
- (2)**

- (b) Expenditure .....
- .....
- .....
- .....
- (2)**

**(Total 4 marks)**

**Q23**



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

Number sold	0	50	100	150	200	250
Fixed cost	£2000	£2000	£2000	£2000	£2000	£2000
Variable cost	£0	£200	£400	£600	£800	£1000
Total cost	£2000	£2200	£2400	£2600	£2800	£3000
Total revenue	£0	£700	£1400	£2100	£2800	£3500

Table 1

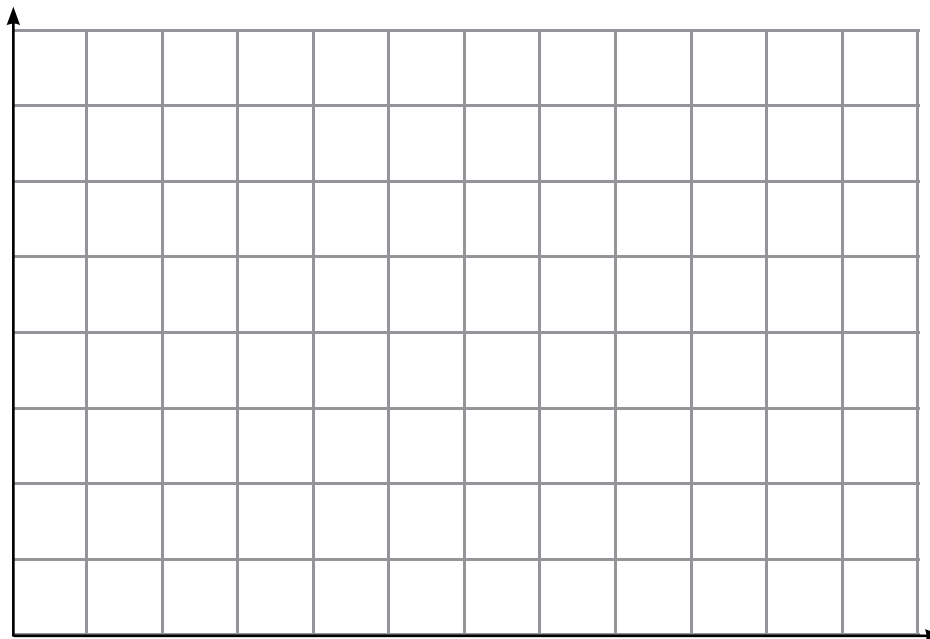


Figure 1

(2)

(b) Indicate the following on your chart.

- (i) Total costs
- (ii) Fixed costs
- (iii) Break-even point

(3)

(c) Determine the loss if only 100 products were sold.

.....  
(1)

(Total 6 marks)

Q24





<p>25. In the UK there are a number of Regional Development Agencies (RDAs). Describe the function of these RDAs.</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>(Total 4 marks)</p>	Leave blank
<b>TOTAL FOR SECTION B: 20 MARKS</b>	

Q25





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**SECTION C**

**Answer ALL the questions. Write your answers in the spaces provided.**

**26.** A major automotive manufacturer operates in the global marketplace, with design and manufacture divided between different divisions in North America, Asia and Europe.

(a) Describe **two** advantages to the manufacturer of operating such a divisional system for the structure of its business.

1 .....

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2 .....

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**(4)**

(b) The research and development (R&D) division is situated in Europe. Explain **one** advantage to the company of doing this, rather than having three different R&D divisions.

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**(2)**



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(c) Major components for automotive engines are manufactured in Asia and shipped to Europe and North America.

With reference to both local and global economies, explain why this is advantageous to both the company and the wider population.

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(4)

Q26

(Total 10 marks)

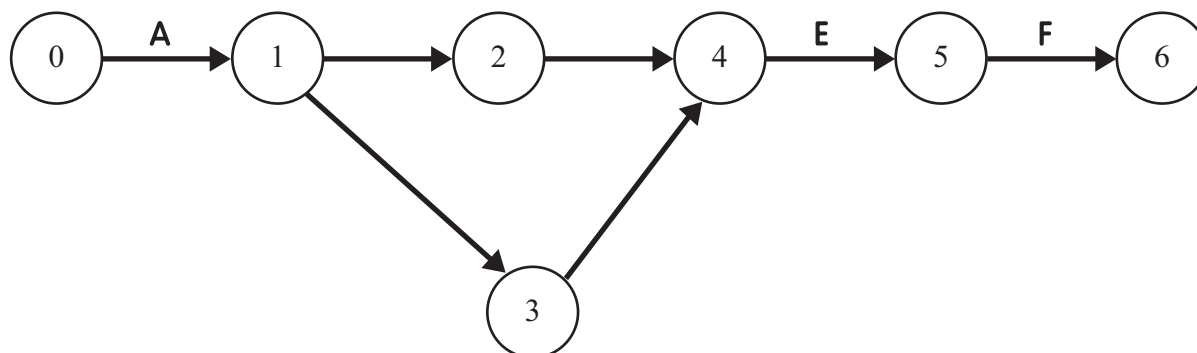


27. An engineering company is engaged on a project to provide electricity pylons which will supply energy to a manufacturing plant.

The tasks which need to be undertaken in order to complete the installation are shown below, along with the time required for each operation.

Activity reference	Activity	Preceding activity	Time required
A	Survey sites for pylons	None	2 days
B	Plan and order materials	A	2 days
C	Prepare foundations for pylons	A	6 days
D	Manufacture pylons	B	8 days
E	Install pylons	C, D	6 days
F	Install cables	E	6 days

(a) Complete the critical path network diagram for the project by labelling activities B, C and D in the correct positions. Label the dummy activity and state the earliest completion time in days.



Earliest completion time = ..... days.

(3)



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(b) As a part of the installation of the pylons and high voltage cabling, engineers will be required to work at significant heights above the ground, and have exposure to high voltage electricity.

Identify **two** stages of risk assessment which will need to be undertaken prior to the start of installation.

1 .....

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2 .....

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(2)

Q27

(Total 5 marks)

28. Explain how engineering and manufacturing companies can become more environmentally responsible.

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Q28

(Total 5 marks)

**TOTAL FOR SECTION C: 20 MARKS**

**TOTAL FOR PAPER: 60 MARKS**

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