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Pearson BTEC Level 1/Level 2 First Certificate	Centre Number					Learner Registration Number				
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<h1>Engineering</h1> <h2>Unit 9: Interpreting and Using Engineering Information</h2>										
Tuesday 17 January 2017 – Morning						Paper Reference				
Time: 1 hour						<b>21174E</b>				
You do not need any other materials.									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 learner registration 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 50.
- 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.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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Answer ALL questions.

Some 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 Engineers use a range of features and drawing types to show information effectively.

(a) Identify **two** types of electronic circuit characteristics shown on drawings.

(2)

- A Pressure
- B Current
- C Texture
- D Voltage
- E Treatment

(b) Different types of drawing are used by technicians to represent designs.

(i) Name **one** type of graphical representation.

(1)

.....

.....

(ii) Name **one** type of working drawing.

(1)

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(c) Give **two** reasons why technicians produce drawings that meet international drawing standards.

(2)

1 .....

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2 .....

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(Total for Question 1 = 6 marks)

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**QUESTION 2 BEGINS ON THE NEXT PAGE.**



2 Engineering drawings are used by engineers to explain the features of components. Figure 1 shows an extract from a bearing bracket assembly drawing.

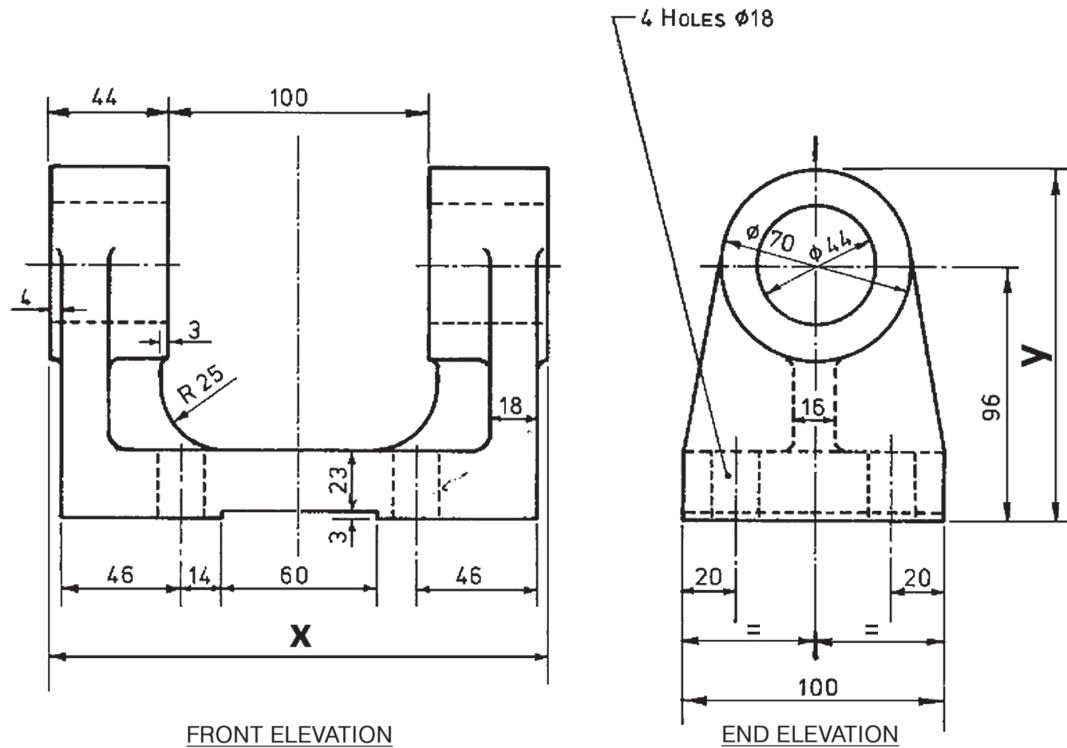


Figure 1

(a) Different symbols are used on the drawing shown in Figure 1.

Complete the table to state the meaning of each symbol.

	Symbol	Meaning
(i)	<b>R</b>	..... (1)
(ii)	<b>Ø</b>	..... (1)



(b) Engineers add dimensions to drawings so parts can be made to the correct size.

Using the dimensions on the drawing shown in Figure 1, calculate the:

(i) Overall width of **x**.

(1)

(ii) Overall width of **y**.

(1)

(c) Engineers use working instructions as well as drawings when making components.

Identify **two** types of working instruction.

(2)

- A** Operation sheet
- B** Pareto chart
- C** Colour code
- D** Accident book
- E** Test schedule

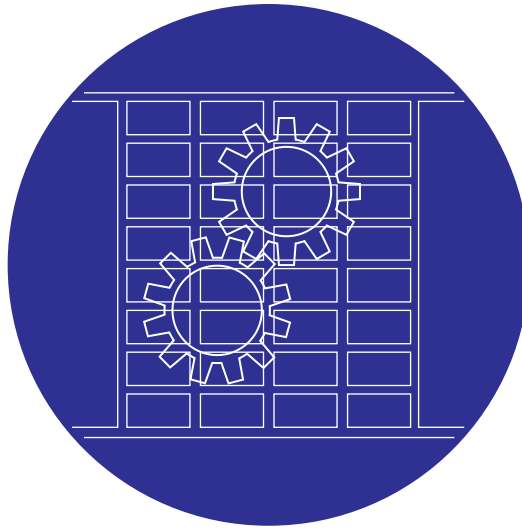
**(Total for Question 2 = 6 marks)**



3 Engineering organisations use signs and documentation to highlight health and safety.

(a) (i) Give **one** example of a health and safety **warning** sign.

(1)



(the background is blue)

**Figure 2**

(ii) Name the **mandatory** health and safety sign shown in Figure 2.

(1)

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(b) Explain **one** reason why health and safety signs are designed using a limited range of colours and outline shapes.

(2)

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(c) Production plans for engineering operations normally include references to health and safety.

Explain **one** advantage for technicians of including health and safety information in a production plan.

(2)

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**(Total for Question 3 = 6 marks)**

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4 A local engineering company carries out a range of machining and fabrication activities to make batches of parts for customers.

(a) Customers provide the company with simple drawings that include basic dimensions.

Identify **two** details that could be added to the drawings so the parts can be made correctly.

(2)

- A Surface textures
- B Access points
- C Timings
- D Fixed reference points
- E Folding methods

(b) The company produces a job card for each batch of parts it makes.

State **two** reasons why the company generates a job card for each batch of parts it makes.

(2)

1 .....

2 .....

(c) The engineering company uses Gantt charts to plan more complex projects.

State **two** reasons for using a Gantt chart when planning complex engineering projects.

(2)

1 .....

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**(Total for Question 4 = 6 marks)**

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**QUESTION 5 BEGINS ON THE NEXT PAGE.**



5 DT88 Engineering produces electronic circuit boards that are fitted into soft drink vending machines. For each different type of circuit board, the company produces formal working drawings.

(a) Name **two** features that would be found on a company standardised layout for a working drawing.

(2)

1 .....

2 .....

(b) The circuit diagrams produced by DT88 Engineering contain electronic symbols.

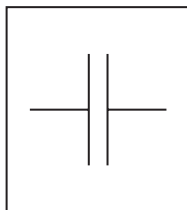
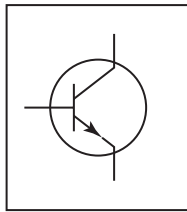
Match the most appropriate electronic component name to each of these electronic symbols.

Draw **one** line from each electronic component symbol to **one** electronic component name.

(2)

**Electronic component symbol**

**Electronic component name**



Battery

Capacitor

Diode

Thermistor

Transistor

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(c) DT88 Engineering performs tests on each circuit board when they are finished and before they are sent to the vending machine assembly company. The vending machine assembly company receives a copy of each test report.

Explain **one** advantage to the vending machine assembly company of DT88 Engineering completing a detailed test report for each circuit board.

(2)

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(d) DT88 Engineering does not repair faulty circuit boards. Circuit board repairs are carried out by technicians that work for other engineering companies.

Explain **two** advantages for DT88 Engineering of storing working drawings using a secure online system in this situation.

(4)

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**(Total for Question 5 = 10 marks)**

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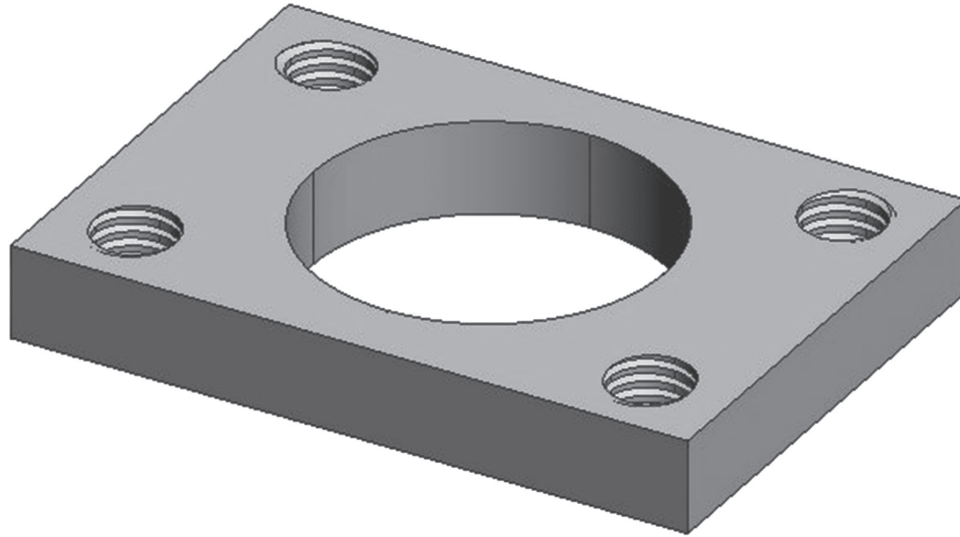
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- 6 M34 Engineering manufactures custom-made mounting plates. Depending on what the customer requires, mounting plates can be joined together and holes can be cut into them for fastenings or for metal shafts to pass through.



- (a) Technicians at M34 Engineering consult Zeus charts when carrying out machining operations on the mounting plates.

Explain **two** reasons why technicians at M34 Engineering would use Zeus charts in this situation.

(4)

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(b) M34 Engineering supplies its customers with process documentation to be used during the assembly of structures that include the mounting plates.

Explain **two** advantages to a customer of M34 Engineering providing process documentation in this situation.

(4)

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**(Total for Question 6 = 8 marks)**

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7 SY16 Engineering manufacture customised high performance car gearboxes. Technicians at SY16 Engineering produce all of the individual components including machined gears, bearings and cast gearbox housings. SY16 Engineering then assemble the individual components into complete gearboxes.

Discuss the reasons why technicians at SY16 Engineering are given a range of different types of drawing in this situation.

[Dotted lines for writing]

**(Total for Question 7 = 8 marks)**

**TOTAL FOR PAPER = 50 MARKS**

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