Please check the examination details below before entering your candidate information

Candidate surname	Other names

Pearson BTEC Level 1/Level 2 First Certificate

Centre Number | | | | | | |

Learner Registration Number | | | | | | | | |

Thursday 7 January 2021

Morning (Time: 1 hour) | Paper Reference **21174E**

Engineering

Unit 9: Interpreting and Using Engineering Information

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 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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1/1/1/1/1/1/1/1/1

P 6 7 4 6 8 A 0 1 2 0

Pearson

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

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 dangerous substances and need to be aware of what safety signs mean.

(a) Identify the correct name for this warning sign.

(1)

☒ **A** Caution trip hazard

☒ **B** Danger of death

☒ **C** Risk of explosion

☒ **D** Slippery surfaces

Health and safety signs use colours to identify different categories.

(b) Identify the colours used for safe condition signs.

(1)

☒ **A** Black and orange

☒ **B** Black and yellow

☒ **C** Green and white

☒ **D** Red and white

In a workshop, signs are used to remind engineers that they must wear safety equipment.

(c) Identify the correct name for each of these mandatory signs.

Draw **one** line from each mandatory sign to **one** mandatory sign name.

(2)

Mandatory sign	**Mandatory sign name**
	Ear protection
	Face protection
	Protective footwear
	Protective gloves
	Safety overalls

(Total for Question 1 = 4 marks)

2 Engineers use different types of working drawing when manufacturing or repairing an engineered product.

Figure 1 shows a type of working drawing.

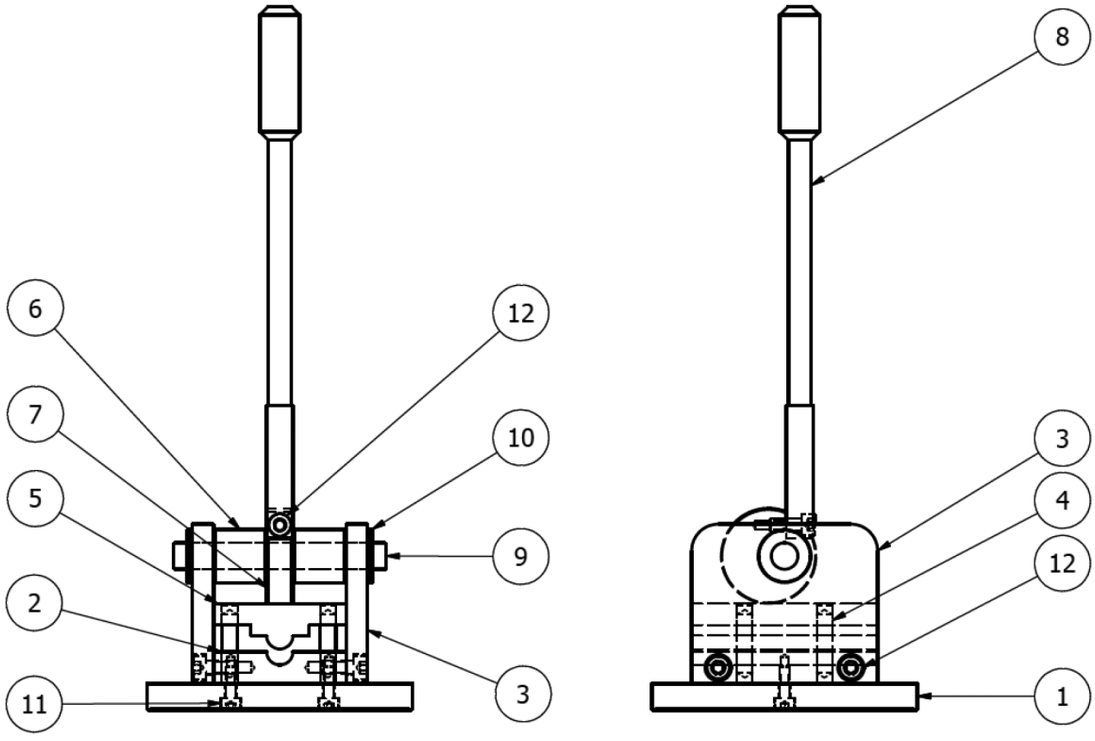


Figure 1

(a) Identify the type of working drawing shown in Figure 1.

(1)

- ☒ **A** Circuit diagram
- ☒ **B** Fabrication
- ☒ **C** General assembly
- ☒ **D** Oblique

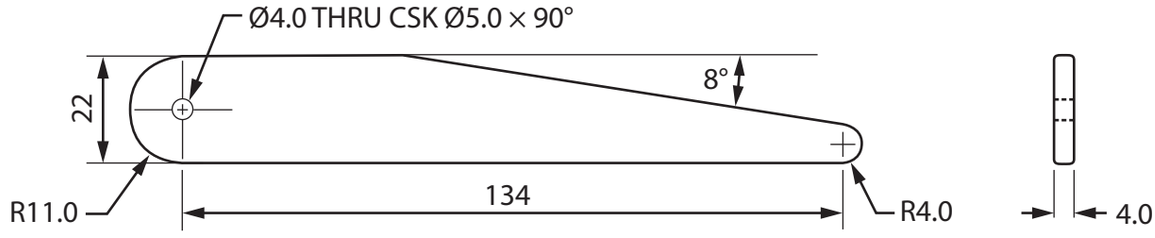
(b) Identify the most appropriate application for each of these drawing types.

Draw **one** line from each drawing type to **one** application.

(2)

Drawing type	**Application**
	Checking the layout of electronic components
Circuit diagram	How to make an adjustment to a drill guard
	Showing pipe connections for water services
Installation drawing	Used to identify dimensions and surface finish when machining components
	Where to position drilled holes on a pitch circular diameter

Figure 2 shows part of an orthographic drawing for a drill drift.



All dimensions in mm

Figure 2

(c) Engineers use a range of abbreviations on engineering drawings.

(i) State the meaning of the abbreviation R.

(1)

.....

.....

(ii) State the meaning of the abbreviation CSK.

(1)

.....

.....

(d) State the overall length of the drill drift in mm.

(1)

.....

.....

(Total for Question 2 = 6 marks)

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

DO NOT WRITE IN THIS AREA

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3 Engineering technicians are given production documentation when carrying out manufacturing operations.

Figure 3 shows a type of production documentation.

Identification Number			
		DH6 Engineering	
Part No:		**Description**	
Customer Name:			
Issued By:			
Issue Date:			
Quantity:			
Quantity Completed			
Operator Initials:			
Work Centre:			
Employee No:		**Completed (Y/N)**	

Figure 3

(a) Identify the type of production documentation shown in Figure 3.

(1)

.....

.....

(b) Identify **two** types of working instruction.

(2)

- ☒ **A** Critical path analysis
- ☒ **B** Contract of employment
- ☒ **C** Manufacturers' manual
- ☒ **D** Pareto chart
- ☒ **E** Weld procedure specification

(c) Engineering technicians use other sources of information when carrying out manufacturing operations.

(i) State a specific information source that contains details of material properties for a type of carbon steel.

(1)

.....

.....

(ii) State a specific information source that includes the drill diameter required to produce an M10 × 1.5 internal thread.

(1)

.....

.....

Figure 4 below shows a Gantt chart, which is used by engineers to schedule the design and manufacture of components for a customer.

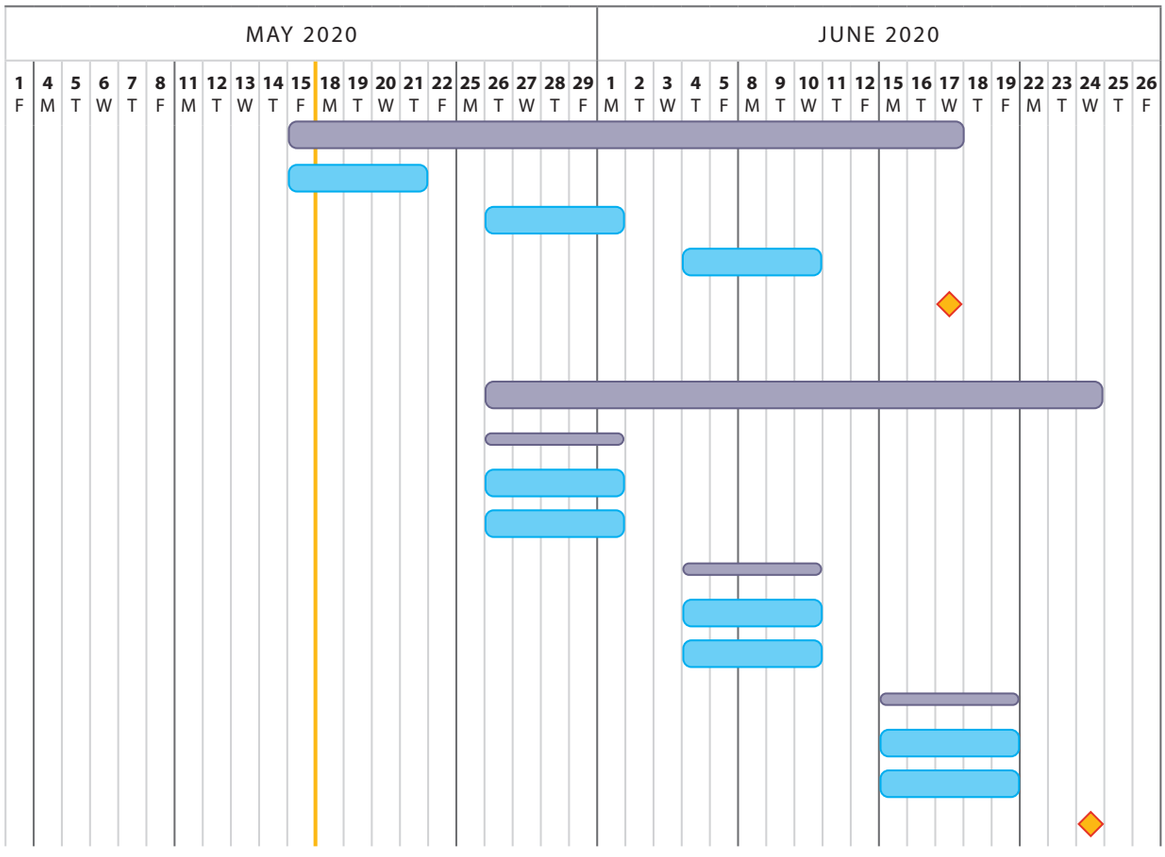

Figure 4

(d) Explain **two** advantages for engineers of using Gantt charts to schedule the design and manufacture of components.

(4)

1 .....

.....

.....

.....

2 .....

.....

.....

.....

(Total for Question 3 = 9 marks)

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4 SR3 Engineering produces precision engineering components that are used in the manufacture of medical equipment. Engineers at SR3 Engineering use a company standardised layout for working drawings.

(a) Figure 5 shows a section of a company standardised layout.

PART No	DESCRIPTION	QTY	A
12	DOWEL	4	TITANIUM
9	SLEEVE	2	BRASS
8	TAPER PIN	2	COPPER
6	SPRING	1	NICKEL BASE ALLOY
5	RETAINING SCREW	6	BRASS
3	COUPLING	4	ALUMINIUM

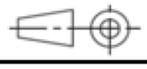
ALL DIMENSIONS IN mm GEN TOL ±0.20mm	B 	DRAWN BY: IP 29/04/2020	CHECKED BY: AW 30/04/2020	SCALE 1:1

Figure 5

(i) Name the heading indicated by the letter A.

(1)

.....

(ii) Name the heading indicated by the letter B.

(1)

.....

(b) Explain **two** advantages for SR3 Engineering of using a company standardised layout for working drawings.

(4)

1 .....

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.....

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2 .....

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(Total for Question 4 = 6 marks)

5 DH1 Engineering manufactures trays from sheet metal, which are used to store tools and equipment, such as machine clamps.

Figure 6 shows a type of drawing for the tooling tray.

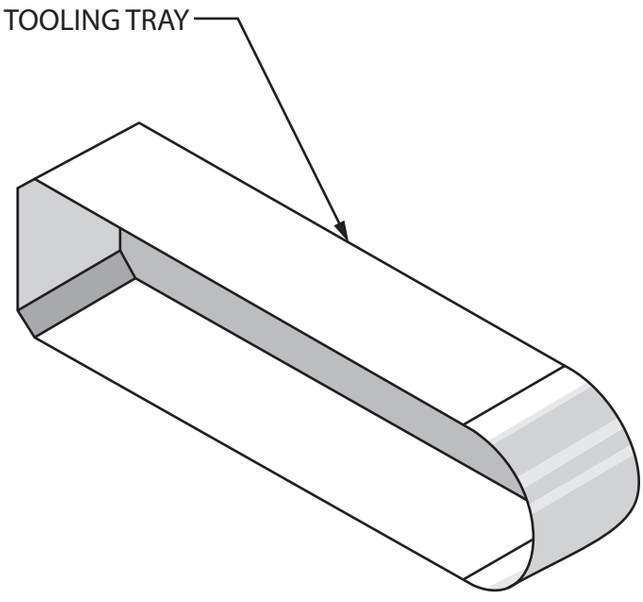

Figure 6

(a) Name the type of drawing shown in Figure 6.

(1)

- ☒ **A** Isometric
- ☒ **B** Oblique
- ☒ **C** Orthographic
- ☒ **D** Perspective

(b) Engineers at DH1 Engineering need to create a production plan before they start making the tooling tray.

State **two** types of information found on a production plan.

(2)

1 .....

.....

2 .....

.....

When making the tooling tray the joints are welded together.

(c) State **two** reasons why an engineer would refer to weld symbols on the engineering drawing before welding the joints.

(2)

1 .....

.....

2 .....

.....

DH1 Engineering uses quality control documentation to record inspection results when making the tooling trays.

(d) Explain **two** advantages for DH1 Engineering of using quality control documentation in this situation.

(4)

1 .....

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.....

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2 .....

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(Total for Question 5 = 9 marks)

6 DH6 Engineering Systems carries out planned maintenance and repairs on machines. The maintenance engineers always refer to manufacturers' manuals when they are working on machines.

(a) Explain **one** reason why the maintenance engineers refer to manufacturers' manuals in this situation.

(2)

(b) Explain **one** reason why maintenance engineers need to handle manufacturers' manuals carefully during maintenance activities.

(2)

DH6 Engineering Systems is updating the storage of its maintenance drawings and documents from a paper-based system to an ICT-based system.

(c) Explain **two** disadvantages for the company of using a paper-based system.

(4)

1

2

(Total for Question 6 = 8 marks)

NE61 Precision Engineering is a small company that specialise in the manufacture of one-off engineering components for customers who restore classic cars. All the engineers are supplied with Zeus charts.

7 Discuss how the engineers would use the Zeus charts to support them with the engineering tasks they carry out.

(8)

(Total for Question 7 = 8 marks)

TOTAL FOR PAPER = 50 MARKS

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