Candidate surname                               Other names

Pearson BTEC
Level 1/Level 2
First Certificate

Centre Number

Learner Registration Number

# Friday 17 May 2019

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* ▶

*P61555A0116*

**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 drawings and documentation to show information effectively.

(a) Identify **two** pieces of information that would be found on a production plan.

**(2)**

☒ **A** component costs

☒ **B** health and safety

☒ **C** pareto charts

☒ **D** quality control checks

☒ **E** accident reporting procedures

(b) Abbreviations are used on drawings to represent component features.

(i) State the meaning of the abbreviation CBORE.

**(1)**

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(ii) State the meaning of the abbreviation EXT.

**(1)**

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(c)
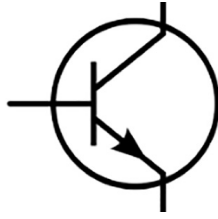


**Figure 1**

Identify the electronic component from the symbol shown in **Figure 1**.

(1)

- ☒ **A** capacitor
- ☒ **B** diode
- ☒ **C** lamp
- ☒ **D** transistor

(d) Tolerances are one type of dimensional detail that can be found on engineering drawings.

State **two** other types of dimensional detail that can be found on engineering drawings.

(2)

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**(Total for Question 1 = 7 marks)**

P 6 1 5 5 5 A 0 3 1 6

**2** Engineers refer to a range of information when carrying out manufacturing activities.

(a) Identify the correct name for each of these safe condition signs.

Draw **one** line from each safe condition sign to **one** safe condition sign name.

(2)

| Safe Condition Sign | Safe Condition Sign Name |
|---|---|



(Background is green)

assembly point

drinking water

emergency eye wash



fire exit

first aid station

(Background is green)

(b) State **one** colour that is used for mandatory health and safety signs.

(1)

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(c) **Figure 2** shows a chart used for planning manufacturing activities.



KEY:

NODE

ACTIVITY
TIME HOURS
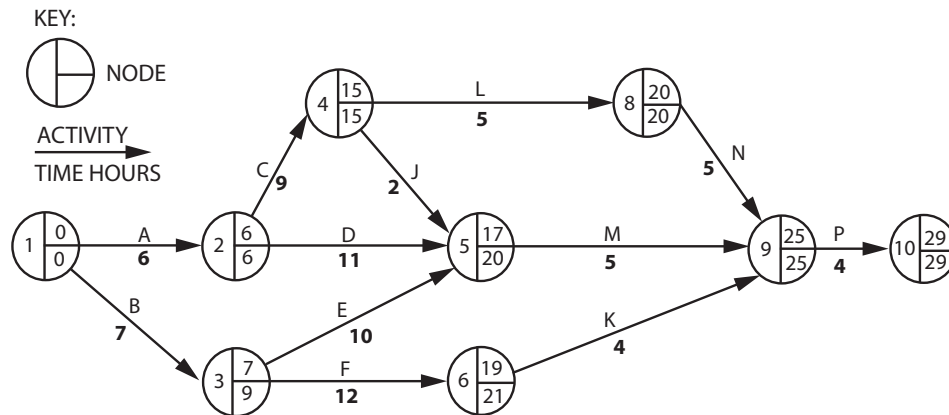
**Figure 2**

(i) Name the type of chart shown in **Figure 2**.

(1)

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(ii) Identify the latest start time, in hours, for activity L.

(1)

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**(Total for Question 2 = 5 marks)**

**3** (a) Identify **two** locations where engineering drawings can be stored securely.

(2)

- ☒ **A** drawing board
- ☒ **B** work bench
- ☒ **C** ICT system
- ☒ **D** filing cabinet
- ☒ **E** PCB jig

(b) State **two** examples of circuit characteristics that can be shown on an engineering drawing.

(2)

1 ............................................................................................................................................................................................................

2 ............................................................................................................................................................................................................

(c) State **two** reasons why engineering drawings are produced to international standards.

(2)

1 ............................................................................................................................................................................................................

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

**4** MK02 Engineering uses mechanical components in the production of self-assembly play equipment.

(a) State **two** engineering process operations where production documentation may be used.

(2)

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(b) Identify the correct name for each of these mechanical components.

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

(2)

| **Mechanical Component Symbol** | **Mechanical Component Name** |
|---|---|
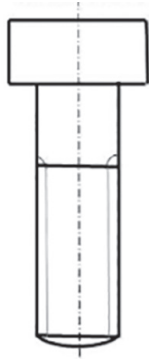
bolt

key

pin
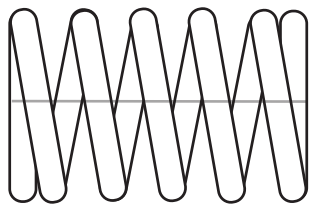
clip

spring

(c) A bracket used in the play equipment is shown in **Figure 3**.
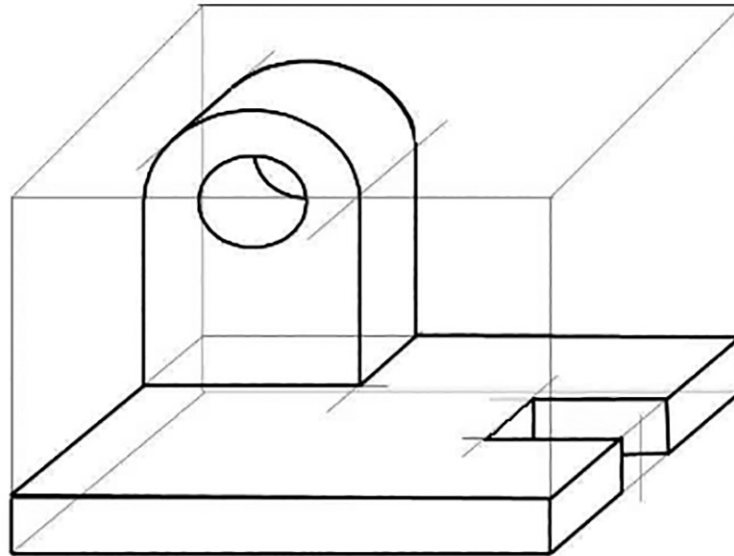


**Figure 3**

Identify the type of drawing shown in **Figure 3**.

(1)

☒ **A** isometric

☒ **B** oblique

☒ **C** orthographic

☒ **D** wiring

(d) MK02 Engineering provides customers with assembly manuals for the play equipment.

Explain **one** advantage of providing assembly manuals in this situation.

(2)

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**(Total for Question 4 = 7 marks)**

**5** VM77 manufactures bicycle racks that are fitted to cars.

The frames are welded together using tubular steel.



Welded joint

Adjustable joint

Frame

(a) State **one** reason why engineers follow a weld procedure specification when welding the frame.

(1)

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(b) The documentation used for assembling the bicycle racks contains an identification number for each part.

Explain **two** advantages of using part numbers in this situation.

(4)

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P 6 1 5 5 5 A 0 9 1 6

(c) Explain **one** advantage of using standard reference charts for limits and fits when producing holes for the adjustable joint.

(2)

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**(Total for Question 5 = 7 marks)**

**6** BB3 Engineering assembles electronic advertising displays that are used in shops.

(a) Explain **one** reason why BB3 Engineering would use manufacturers' data sheets for components when assembling electronic circuits.

(2)

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When installing an advertising display, an engineer notices a discrepancy between the electronic components specified on two different pages of an assembly manual.

(b) Explain **two** advantages of the discrepancy being reported to BB3 Engineering.

(4)

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(c) Explain **two** advantages of BB3 Engineering using statistical process control charts during production of the electronic advertising displays.

(4)

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**(Total for Question 6 = 10 marks)**

**7** PE60 Engineering construct and install complex electrical equipment in new industrial buildings.

The electrical equipment requires components to be purchased from many different suppliers.

Discuss the advantages to PE60 Engineering of using Gantt charts when scheduling the construction and installation of the electrical equipment.

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

**TOTAL FOR PAPER = 50 MARKS**

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