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| Centre Number | | | | | Learner Registration Number | | | | |
| Pearson BTEC Level 1/Level 2 First Certificate | | | | | | | | | |

Engineering

Unit 9: Interpreting and Using Engineering Information

| | |
|--|----------------------------------|
| Wednesday 4 June 2014 – Afternoon Time: 1 hour | Paper Reference 21174E |
|--|----------------------------------|

| | |
|--|-------------|
| You must have: Insert (enclosed) | Total Marks |
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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.
- Keep an eye on the time.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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PEARSON

Some questions must be answered with a cross . If you change your mind about an answer, put a line through the box and then mark your new answer with a cross .

Answer ALL questions.

1 Chemical engineers use dangerous substances and need to be aware of what safety signs mean.

(a) What does this safety sign mean?

(1)



The background is orange.

- A Biohazard
- B Irritant
- C Explosive
- D Flammable

(b) Health and safety signs use colours to identify different categories.

(i) Identify the correct colours used to display **safe condition** signs.

(1)

- A Red and white
- B Orange and black
- C Green and white
- D Yellow and black

(ii) Name **two** signs from the **mandatory** category.

(2)

1

2

(Total for Question 1 = 4 marks)



2 (a) Electronic symbols are used by technicians when drawing circuit diagrams.

(i) Match the most appropriate component name for both of these electronic symbols.

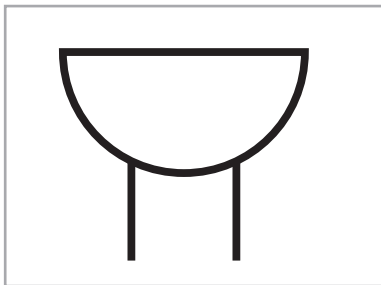
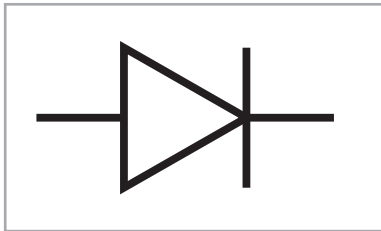
Draw a straight line to match each electronic symbol to its associated component name.

Each electronic symbol has only **one** component name.

(2)

Electronic symbol

Component name



Buzzer

Transistor

Resistor

Diode

Lamp

(ii) Give **two** reasons why electronic symbols are used when drawing circuit diagrams.

(2)

1

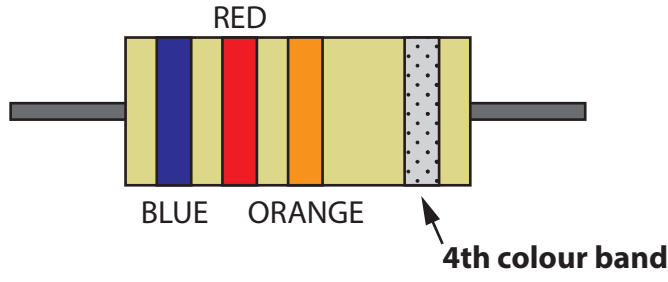
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2

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(b) Engineers use resistors in electronic circuits. The value of a resistor can be identified by a colour code system.



| | | |
|--------|---|---|
| BLACK |  | 0 |
| BROWN |  | 1 |
| RED |  | 2 |
| ORANGE |  | 3 |
| YELLOW |  | 4 |
| GREEN |  | 5 |
| BLUE |  | 6 |
| VIOLET |  | 7 |
| GRAY |  | 8 |
| WHITE |  | 9 |

(i) Identify the value of the above resistor using the 4-band colour code method. (1)

(ii) What is the reason for the 4th colour band on the above resistor? (1)



(iii) A resistor colour wheel is supplied with data sheets from a component manufacturer.



An engineer is required to build a complicated circuit that uses numerous resistors with different values. The engineer's first task is to find the correct resistors, using the resistor colour wheel to speed up the process.

Explain **two** other reasons why the engineer would use a resistor colour wheel in this situation.

(4)

1

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2

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(Total for Question 2 = 10 marks)



3 Use the insert to answer all parts of Question 3.

(a) Which linetype is an extension line?

(1)

A

B

C

D

(b) Determine the distance labelled E.

(1)

(c) What does the symbol R mean?

(1)

(d) Explain **two** errors on the mounting bracket drawing that will cause a problem when interpreting information.

(4)

1

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2

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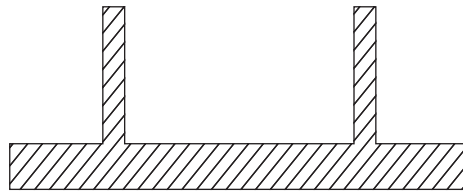
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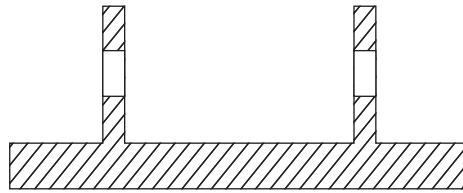
(e) Identify the correct section view for F-F on the mounting bracket drawing.

(1)

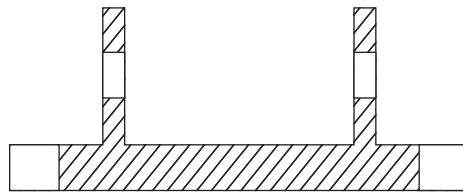
A



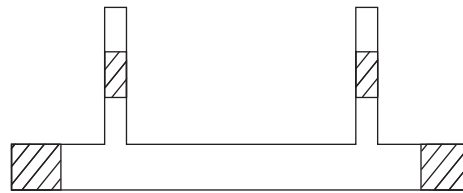
B



C



D



(f) Explain **one** advantage of using sectioned drawings to enable the production of mechanical assemblies and components.

(2)

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(Total for Question 3 = 10 marks)



4 Sparks Galore Ltd is an engineering fabrication company that specialises in welding. It uses welding drawings and weld procedure specifications to enable the production of support structures for overhead electric cables.

(a) Which **one** of these symbols is used to represent a square butt/groove on a welding drawing?

(1)

A 

B 

C 

D 

(b) What does the following welding symbol indicate?

(1)



(c) Explain **one** advantage of using weld procedure specifications when welding support structures for overhead electric cables.

(2)

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(Total for Question 4 = 4 marks)



5 ABC Precision Engineering manufactures support bushes for the marine industry using turning processes.

It uses production plans and related documentation when manufacturing support bushes.

The image shows a support bush.



(Source: © Lohen 2013)

(a) State **two** pieces of health and safety information that could be found in a production plan for the support bush.

(2)

1

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2

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(b) Describe **one** type of related documentation that could be used to schedule the manufacture of a large batch of support bushes.

(2)

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(c) Two engineers at ABC Precision Engineering made prototype support bushes using a drawing. Both prototypes were accepted as fit for purpose. Although the prototypes were accurate, a production plan must be created before batch production can begin.

Apart from health and safety requirements, explain **two** reasons why the production plan is required in addition to the drawing.

(4)

1

2

(Total for Question 5 = 8 marks)



6 XYZ Engineering manufactures a variety of components and sub-assemblies for several different customers. It uses a range of drawings and production documentation to support its manufacturing operations.

(a) Give **two** reasons why XYZ Engineering has a specific documentation control system for its engineering drawings.

(2)

1

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2

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Below is an example of a job card used by XYZ Engineering during the manufacture of sub-assemblies.

| JOB CARD | | | | | | |
|--------------------------------|------------------------|---------------------------------|------------------|-------------------|------|----------|
| Job No.: 67354 | Order Date: 15/07/12 | Free Issue Material | | Rec'd: | | |
| Reg No.: 10000 | C of C Req'd: Yes | Material Certificate: Y | | No.: EN8124 | | |
| Print Date: 18/07/12 | Sales Order No.: 67354 | Inspection Report: Y | | No.: 56321 | | |
| Customer: Neale Swift Kit Cars | | | | Order No.: s52307 | | |
| Drawing No.: CA23 | | Issue No.: 002 | | | | |
| Batch No.: 00345 | | Sub-assembly No.: 0231 | | | | |
| Order Qty: 100 | F/Stock Qty: 0 | WIP Qty: 0 | Qty to Make: 100 | Entered by: SW | | |
| Special instructions: | | | | | | |
| Delivery Schedules | | | | | | |
| Qty: 2 | Due Date: 19/09/12 | Customer Order No.: 43975395709 | | | | |
| Material Details | | | | | | |
| Stock ID | Descriptions | Total Qty | Units | Order No | Item | Due Date |
| | | | | | | |
| Production Schedule | | | | | | |
| Op No | Op Description | WK Centre | | | | |
| | | | | | | |

(b) This job card provides a variety of information.

Explain **two** ways in which XYZ Engineering would use this information.

(4)

1

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2

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