Write your name here

Surname	Other names

Pearson BTEC Level 1/Level 2 First Certificate

Centre Number | | | | | | |

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

Engineering

Unit 9: Interpreting and Using Engineering Information

Tuesday 24 May 2016 – Morning
Time: 1 hour

Paper Reference
21174E

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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P 4 6 7 5 4 A 0 1 1 2

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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 When preparing to produce parts in a workshop a range of different information is used.

A production plan is one important source of information.

(a) Identify **two** characteristics of a production plan.

(2)

- ☒ **A** Material and components
- ☒ **B** Calculations
- ☒ **C** Timings
- ☒ **D** Repair
- ☒ **E** Reporting of loss

(b) Health and safety signs are used in workshops.

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**
	Wear head protection
The background is blue	Wear ear protection
	Wear eye protection
The background is blue	Wear foot protection
	Wear hand protection

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(c) Identify **one** type of production documentation that is relevant to producing parts accurately.

(1)

- ☒ **A** Quality control
- ☒ **B** Design briefs
- ☒ **C** PPE standards
- ☒ **D** Packaging instructions

(d) Manufacturers use sources relevant to the task when preparing to produce parts.

The diagram shows an extract from manufacturers' data for the use of welding rods.

Flux-cored and metal cored arc welding				
Material	**A**	**Condition**	**Shielding Gas**	**Specification**
Mild Steel	1.8–2.5 mm	Clean	CO_2	ML-R-5632
Aluminium	6.4–12.7mm	Clean	CO_2	AWS A5-10

(i) Name the heading in Box A.

(1)

.....

(ii) Give **one** reason for using material specifications when preparing to produce parts.

(1)

.....

(e) State **one** reason for using manufacturers' manuals when preparing to produce parts.

(1)

.....

(Total for Question 1 = 8 marks)

2 Engineers refer to charts and diagrams when scheduling manufacture.

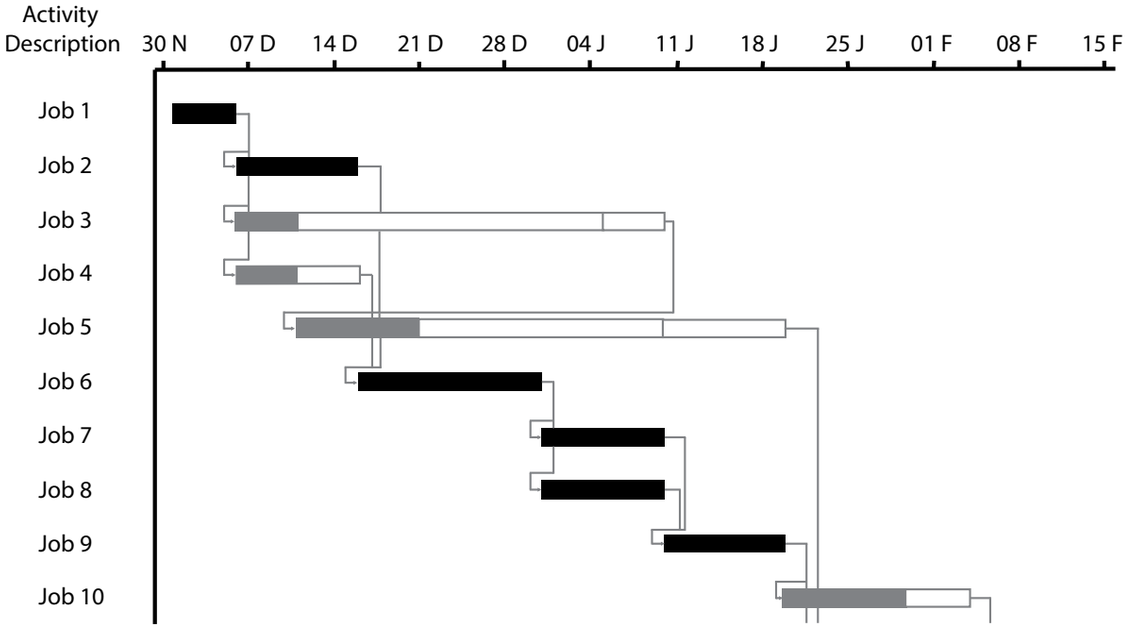
(a) Identify **two** features of a schedule for manufacture.

(2)

- ☒ **A** Milestones
- ☒ **B** Isometric
- ☒ **C** Static beam
- ☒ **D** Milling cutter
- ☒ **E** Start date

(b) The diagram shows an extract from a chart used when scheduling manufacture.

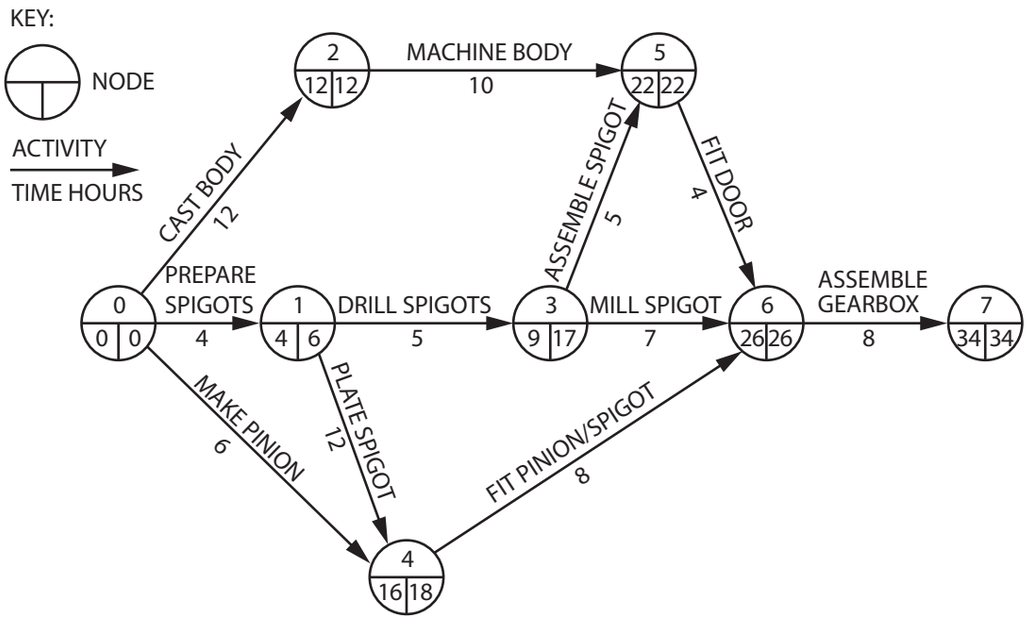
(i) Identify the type of chart.



(1)

- ☒ **A** Zeus
- ☒ **B** Gantt
- ☒ **C** Hertz
- ☒ **D** Pareto

The diagram shows a graphical method of scheduling manufacture.



(ii) Identify this graphical method.

(1)

- ☒ **A** Cellular production plan
- ☒ **B** Circuit characteristics
- ☒ **C** Critical path analysis
- ☒ **D** Orthographic projection

(c) Diagrams like these are often located and stored electronically.

Identify the system used for this.

(1)

- ☒ **A** PCD system
- ☒ **B** LED system
- ☒ **C** EXT system
- ☒ **D** ICT system

(Total for Question 2 = 5 marks)

3 Engineers use work output, production and related documentation when planning and carrying out maintenance activities.

(a) Explain **one** advantage of an engineer completing a job card after carrying out maintenance activities.

(2)

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(b) Explain **two** advantages of an aircraft maintenance engineer completing a test report after carrying out a maintenance procedure on an aircraft engine.

(4)

1 .....

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2 .....

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.....

(c) Engineers also use working instructions when carrying out maintenance operations.

Identify **two** types of working instruction.

(2)

- ☒ **A** Resistor colour codes
- ☒ **B** Tapping allowances
- ☒ **C** Operations sheets
- ☒ **D** Weld procedure specifications
- ☒ **E** Pattern numbers

(d) Give **two** reasons why an engineer would use quality control information and charts when planning maintenance activities.

(2)

1 .....

.....

2 .....

.....

(Total for Question 3 = 10 marks)

4 A specialist sports car manufacturer builds one-off cars based on customer needs. It stores the paper drawing for each car part in a filing cabinet in the main office. A range of drawing sizes are used.

(a) Give **two** advantages of using specific folding methods when handling drawings.

(2)

1 .....

.....

2 .....

.....

The paper drawings will be handled by engineers when building the cars and when manufacturing spare parts.

Incorrect folding of these drawings can cause problems.

(b) Explain **two** other disadvantages of engineers handling a paper drawing for these activities.

(4)

1 .....

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2 .....

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(Total for Question 4 = 6 marks)

5 Engineers use working drawings when designing components and assemblies.

(a) Drawings often feature standard components and symbols.

(i) Name **two** mechanical component symbols.

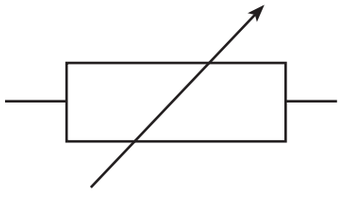
(2)

1 .....

2 .....

(ii) Name the component shown by the circuit symbol.

(1)



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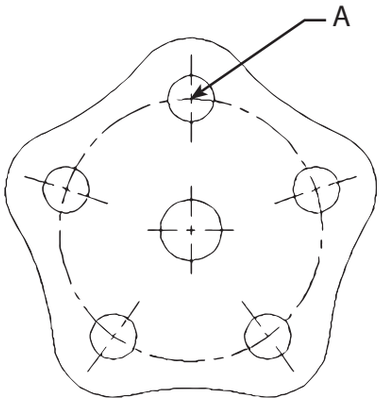
(iii) The image shows an incomplete drawing of part of a clutch housing, which is to be connected to a gearbox housing.

The designer is considering using point A as a fixed reference point when adding dimensions.



Explain **one** reason for using a fixed reference point when dimensioning the clutch housing.

(2)

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(b) The designer is thinking of placing linear toleranced dimensions on the drawing.

(i) If the holes are to have a diameter of 25 ±0.4mm, state the upper and lower limits of diameter.

(2)

Upper limit diameter .....

Lower limit diameter .....

(ii) The designer is thinking of adding a geometric tolerance to the drawing.

Explain **one** reason for using a geometric tolerance on this drawing.

(2)

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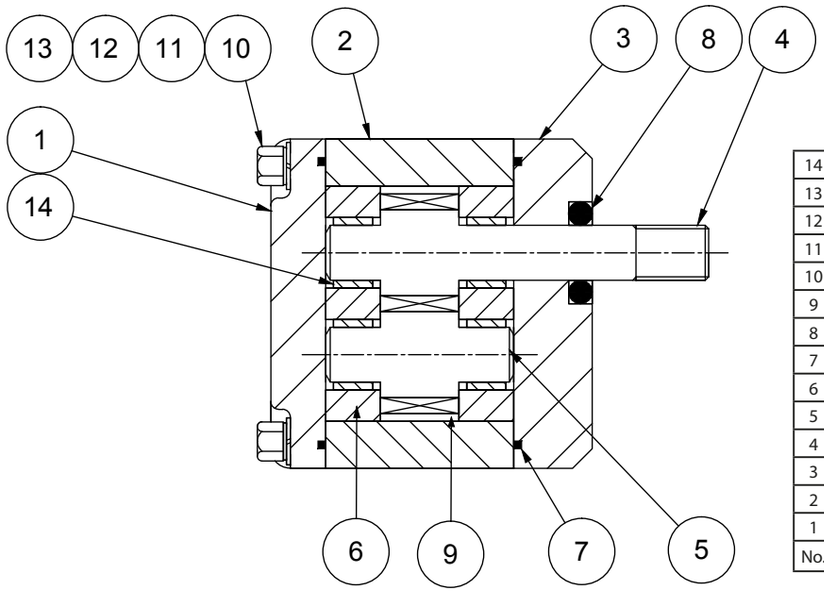
(Total for Question 5 = 9 marks)

6 Pardpumps is a volume manufacturer of hydraulic pumps for the agricultural engineering sector. It designs and manufactures a standard range of pumps and also specialist pumps for specific pieces of agricultural equipment.

The diagram shows an assembly drawing for a pump.



Notes

A.
B.
C.
D.

No.	Part	Quantity
14	Bush	4
13	Thread locking compound	0.5cc
12	Flat washer	4
11	Spring washer	4
10	Screw	4
9	Grease	2cc
8	Shaft seal	1
7	Seal	2
6	Bearing	2
5	Driven gear	1
4	Drive gear	1
3	Front cover	1
2	Body	1
1	Cover	1

(a) Assembly drawings are used by engineers on the production line to build these pumps. As well as using balloon referencing and parts lists on these drawings, notes are also added.

Explain **two** advantages to Pardpumps of using notes on the assembly drawing when manufacturing the pump.

(4)

1 .....

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2 .....

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(b) Pardpumps is considering producing a schematic diagram of the specialist pump it designs for each customer.

Discuss the implications of producing a schematic diagram in this situation.

(8)

(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 50 MARKS

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