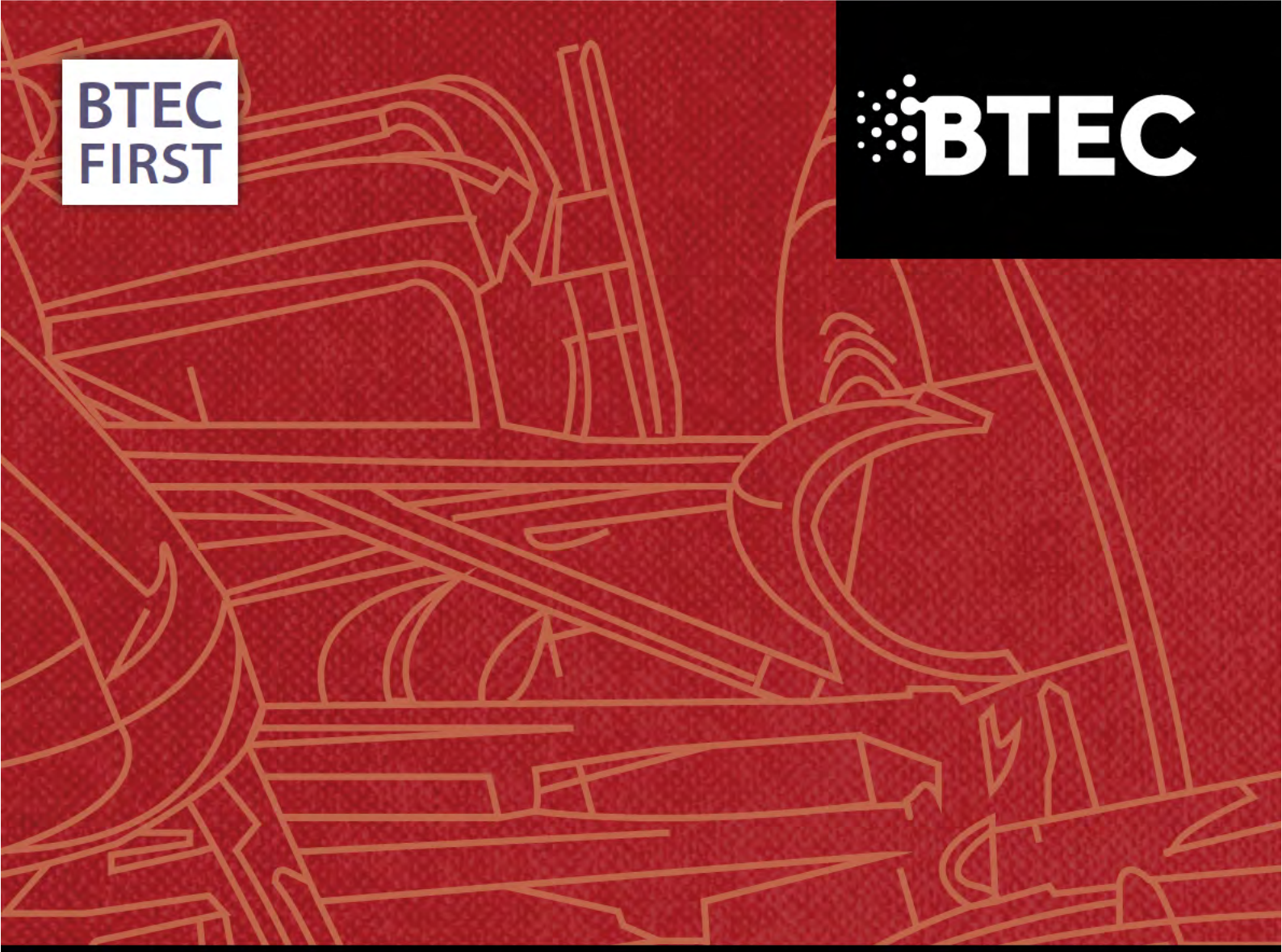
BTEC FIRST

BTEC



Sample Assessment Materials (SAMs)

ENGINEERING

From September 2013

Pearson BTEC Level 1/Level 2 First Award in Engineering
Pearson BTEC Level 1/Level 2 First Certificate in Engineering
Pearson BTEC Level 1/Level 2 First Extended Certificate in Engineering
Pearson BTEC Level 1/Level 2 First Diploma in Engineering

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Introduction

Sample assessment materials (SAMs) provide learners and centres with specimen questions and mark schemes. These are used as the benchmark to develop the external assessment learners will take.

Unit 1: The Engineered World

The SAMs for this external unit have been provided for the following qualifications:

- BTEC Level 1/Level 2 First Award in Engineering
- BTEC Level 1/Level 2 First Certificate in Engineering
- BTEC Level 1/Level 2 First Extended Certificate in Engineering
- BTEC Level 1/Level 2 First Diploma in Engineering.

The sample test demonstrates some of the mechanisms used within an onscreen test.

Unit 9: Interpreting and Using Engineering Information

The SAMs for this external unit have been provided for the following qualifications:

- BTEC Level 1/Level 2 First Certificate in Engineering
- BTEC Level 1/Level 2 First Extended Certificate in Engineering
- BTEC Level 1/Level 2 First Diploma in Engineering.

As the Award is nested within the Certificate and Extended Certificate, we have adopted the convention of titling external assessments for the smallest award for which they are available across the whole BTEC first suite. This is the same convention used for AS/GCE which is also a nested qualification.

Unit 1: The Engineered World – sample assessment test and mark scheme

This sample assessment test and mark scheme is for the following qualifications:

- BTEC Level 1/Level 2 First Award in Engineering
- BTEC Level 1/Level 2 First Certificate in Engineering
- BTEC Level 1/Level 2 First Extended Certificate in Engineering
- BTEC Level 1/Level 2 First Diploma in Engineering.

The sample assessment test is available online at www.btec.co.uk/engineering2012

General marking guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than be penalised for omissions.
- Examiners should mark according to the mark scheme, not according to their perception of where the grade boundaries may lie.
- All marks on the mark scheme should be used appropriately.
- All the marks in the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgment is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.

Question Number	Answer	Mark
1	Turning Drilling 1 mark for **each** correct answer	**(1)** **(1)**

Question Number	Answer	Mark
2	Jet engine – Aerospace Motorbike – Automotive 1 mark for **each** correct answer	**(1)** **(1)**

Question Number	Answer	Mark
3	Any **two** from the following: • They could be considered to be visually unattractive (1) • They must be positioned correctly [south facing] (1) • They could have a detrimental effect on the structural stability of the roof (1) • They need sunshine/bright daylight to operate efficiently (1) • They require an initial cost outlay that is substantial (1) • It takes a long time to recover the initial cost outlay through savings on energy bills (1) **Accept any other appropriate alternatives.**	**(2)**

Question Number	Answer	Mark
4	To meet the high demand for products (1) To reduce the cost to make products (1) 1 mark for **each** correct answer	**(1)** **(1)**

Question Number	Answer	Mark
5	Bullet proof vest – Kevlar Canoe – Glass reinforced plastic 1 mark for **each** correct answer	**(1)** **(1)**

Question Number	Answer	Mark
6	Any **three** from the following: • Guard in position (1) • Hold work in a machine vice and not in hand (1) • Do not remove swarf by hand (1) • Wear safety glasses (1) • Long hair tied back (1) • Do not distract others whilst using machinery (1) • Secure loose clothing (1) • Use a hand vice (1) **Accept any other appropriate alternatives.**	**(3)**

Question Number	Answer	Mark
7	Any **two** from the following: • They need to be reprogrammed for different products (1) • They include high set up/maintenance costs (1) • Small manufacturing errors are likely to lead to substantial downtime (1) • Small manufacturing errors are likely to lead to substantial rework (1) **Accept any other appropriate alternatives.**	**(2)**

Question Number	Answer	Mark
8	Any **two** from the following: • Strong (1) • Lightweight (1) • Durable (1) • Flexible (1) • Suitable for mass production (1) **Accept any other appropriate alternatives.**	**(2)**

Question Number	Answer	Mark
9	Any explained advantage from, for example: • Smaller components (1) results in a smaller PCB/low energy consumption (1) • Components can be soldered on both sides of a circuit board (1) so that it maximises the space (1) • Components are mechanically stronger (1) so that they don't detach under shake or vibrate conditions (1) • Easy to automate (1) so placement errors can be automatically corrected (1) **Accept any other appropriate alternatives. Accept any reasonable explanation provided it relates to the advantage identified.**	**(2)**

Question Number	Answer	Mark
10	(a) Chuck on diagram identified (b) Table 1 mark for **each** correct answer	**(1)** **(1)**

Question Number	Answer	Mark
11	Any **two** advantages from, for example: • Highly accurate/consistent quality (1) • Can work continuously, 24/7 (1) • Labour costs will be reduced (1) • Can operate in extreme/dangerous conditions (1) **Accept any other appropriate alternatives.**	**(2)**

Question Number	Answer	Mark
12	(a) Titanium (b) Casting 1 mark for **each** correct answer	**(1)** **(1)**

Question Number	Answer	Mark
13	Detection	**(1)**

Question Number	Answer	Mark
14	Sintering	**(1)**

Question Number	Answer	Mark
15	(a) Colour (b) Heat 1 mark for **each** correct answer.	**(1)** **(1)**

Question Number	Answer	Mark
16	Riser is correctly identified.	**(1)**

Question Number	Answer	Mark
17	Alloy wheel	**(1)**

Question Number	Answer	Mark
18	Any **one** explained advantage from, for example: • Energy absorption/metallic foams will improve sound dampening (1) so the driver is cushioned from excessive noise at high speeds (1) • Energy absorption/metallic foams will improve safety (1) so the driver is less likely to be injured if a crash/impact occurs (1) • Energy absorption/metallic foams will generate a dampening effect over rough ground (1) thereby improving the vehicle ride (1) **Accept any other appropriate alternatives. Accept any reasonable explanation provided it relates to the advantage identified.**	**(2)**

Question Number	Answer	Mark
19	Up to 2 marks per explained advantage. **Advantages** likely to be identified include: • Flexibility (1) can be used in large-scale wind farms for national grid/small individual turbines for rural or isolated locations (1) • Use of wind turbines is non-polluting/ environmentally friendly/sustainable (1) • Produce 50x more energy over its lifetime as is consumed by its construction and installation (1) • Produces low-cost power (1) involves low running and maintenance costs (1) • Can be installed off-shore (1) which minimises visual impact/takes advantage of the constant breezes over open water **Accept any other appropriate alternatives** Up to 2 marks per explained disadvantage. **Disadvantages** likely to be identified include: • Can only provide a small amount of the total energy (1) due to the small amount of turbines available • Infrastructure (1) required for wind farms causes some damage to landscape e.g. access roads for maintenance (1) • Controversial (1) as noise and vibration of moving turbine has potential to affect local community and livestock • Affects environmentally sensitive coastal sites (1) e.g. those with lots of nesting birds (1). Also turbines spoil picturesque landscapes (1) **Accept any other appropriate alternatives.**	**(2)** **(2)**

Question Number	Answer	Mark
20	Composite	**(1)**

Question Number	Answer	Mark
21	Any **two** explained advantages from, for example: • Environmentally friendly (1) as it has low/no emissions (1) / as only water vapour is emitted (1) • Small amounts of fuel required to travel long distances (1) therefore, highly efficient technology (1) / cost of vehicle fuel reduced (1) • Very simple construction (1) due to few moving parts (1) / low mass production costs (1) **Accept any other appropriate alternatives.** **Accept any reasonable explanation provided it relates to the advantage identified.**	**(4)**

Question Number	Indicative content	Mark
22	Advantages, e.g.: • Reduces the cost of inventory [storing raw materials/finished goods] • Reduces work in progress/working capital • Can reduce the occurrence of accidental damage • Balances worker inputs on a production line/reduces worker downtime • Regular production patterns/downtime can be more easily planned (i.e. maintenance) • Pull system/reduces overproduction • Emphasis placed on 'getting it right first time' • Allows specialisation/increases throughput Disadvantages, e.g.: • No room for mistakes • Minimal stock is kept for spikes in production • No inventory if unexpected orders arise • Heavy reliance on suppliers Judgement, e.g.: • The 'Just-in-Time' method reduces waste if - suppliers can be trusted/demand for a product is reasonably consistent • The 'Just-in-Time method could increase waste if - Push production replaces pull/ quality control procedures are not rigorous Apply the levels mark scheme below.	**(8)**

Level	Marks	Descriptor
	0	No rewardable material.
1	1-3	Basic arguments on both sides identified, **or** only one side considered. The answer is likely to be in the form of a list. Points made will be superficial/generic and not applied/directly linked to the situation in the question. No conclusion produced or the conclusion a consequence of only one side of the argument being considered.
2	4-6	Arguments for and against are described, but there will be more emphasis on one side than the other. The answer will be unbalanced. A conclusion is present, but this is either implicit or as a result of unbalanced consideration of the arguments. There is little or unfocused justification of the conclusion. Most points made will be relevant to the situation in the question, but the link will not always be clear.
3	7-8	Balanced explanation of both sides for and against. A conclusion is produced which is justified clearly linked to the consideration of arguments for and against, and their relative importance to the situation. The majority of points made will be relevant and there will be a clear link to the situation in the question.

Unit 9: Interpreting and Using Engineering Information - sample assessment test and mark scheme

The SAMs for this external unit have been provided for the following qualifications:

- BTEC Level 1/Level 2 First Certificate in Engineering
- BTEC Level 1/Level 2 First Extended Certificate in Engineering
- BTEC Level 1/Level 2 First Diploma in Engineering.

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

Sample Assessment Material

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 ▶

S45227A

S 4 5 2 2 7 A 0 1 1 6

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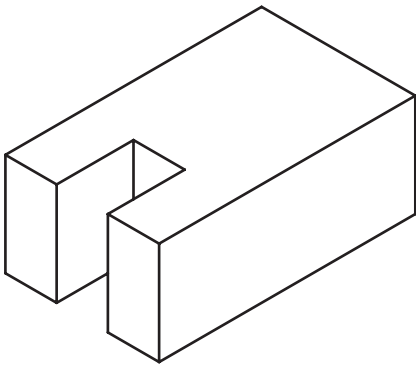
Some questions must be answered with a cross in a box ☒. If you change your mind about an answer, put a line through the box ☒ and then mark your new answer with a cross ☒.

Answer ALL questions.

1 Engineers use different types of drawing to convey information effectively.



(a) What type of drawing is this?

(1)

- ☒ **A** Isometric
- ☒ **B** Oblique
- ☒ **C** 1st angle projection
- ☒ **D** Exploded diagram

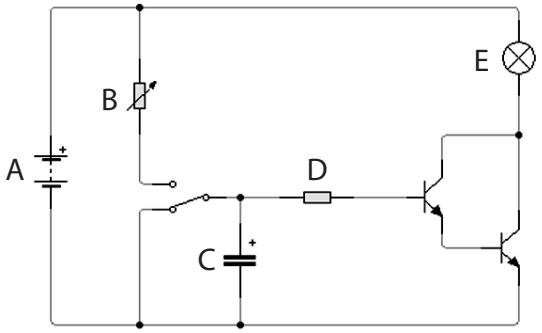
(b) Identify the most appropriate application for each of these drawing types.

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

(2)

Drawing type	**Application**
	Monitoring production
Third angle projection	Producing a PCB
	Presenting to a client
Isometric	Showing how parts are assembled
	Manufacturing a product

(c) This simple schematic diagram shows an electronic circuit.



(i) Which component is the **variable resistor**?

(1)

Component	Please tick
A	
B	
C	
D	
E	

(ii) Which component is the **capacitor**?

(1)

Component	Please tick
A	
B	
C	
D	
E	

(iii) Explain **one** advantage of a schematic diagram.

(2)

.....

.....

.....

.....

(Total for Question 1 = 7 marks)

2 Sound Sure Ltd is an engineering company that employs installation engineers.

(a) Installation engineers visiting different buildings need to be aware of what safety signs mean.

(i) What does this safety sign mean?

(1)

The circle is blue

.....

(ii) This is a common symbol seen in buildings.

The triangle is yellow

Give **two** rules that installation engineers must follow when this symbol is displayed.

(2)

1 .....

.....

2 .....

.....

(b) The installation engineers use component data sheets.

Which **two** of these would be shown on an electronic component data sheet?

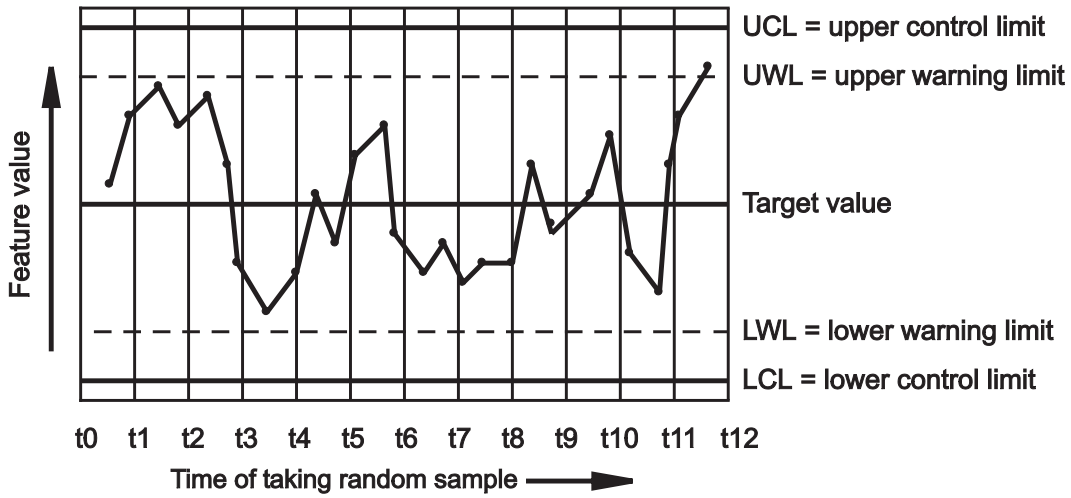
(2)

- ☒ **A** Replacement date
- ☒ **B** Power consumption
- ☒ **C** Bend allowance
- ☒ **D** Supply voltage
- ☒ **E** Order analysis

(Total for Question 2 = 5 marks)

3 Launch Engineering Ltd has project teams that use statistical process control flow charts when producing sub-assemblies for aircraft wings. Each team must meet deadlines for its sub-assemblies to ensure the wings are produced on time.

The engineers are considering using statistical process control flow charts. Here is an example.



(a) Explain how using statistical process control can help to achieve quality in manufacture.

(2)

.....

.....

.....

.....

(b) Explain **two** limitations of using statistical process control in the manufacture of components.

(4)

1 .....

.....

.....

.....

2 .....

.....

.....

.....

The engineering team must keep documents correctly and interpret them accurately to complete work effectively.

(c) Engineers use a drawing title block to provide accurate information about a drawing.

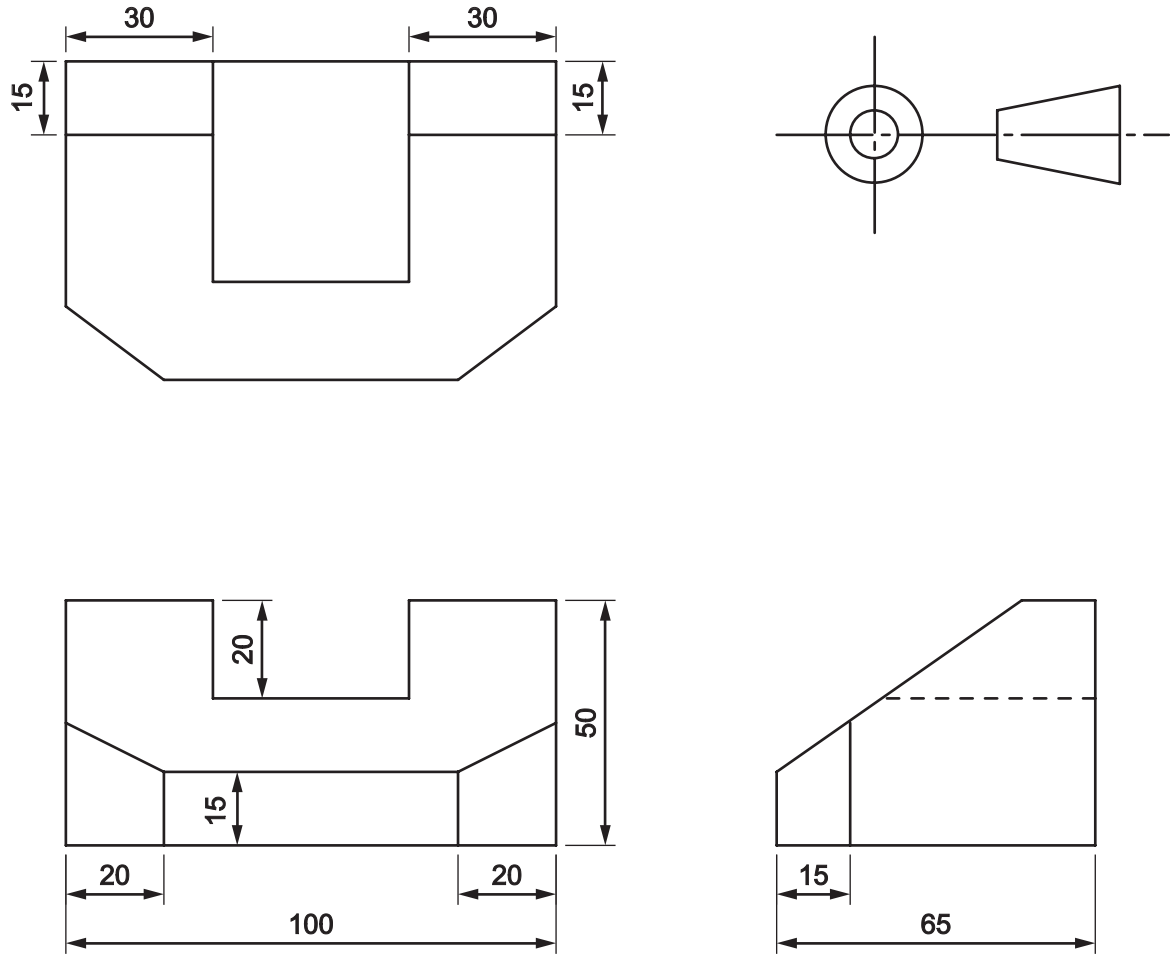
Give **two** pieces of information about a drawing that would be included in a drawing title block.

(2)

1 .....

2 .....

(d) One of the sub-assembly teams at Launch Engineering Ltd uses this working drawing for a new aircraft component.

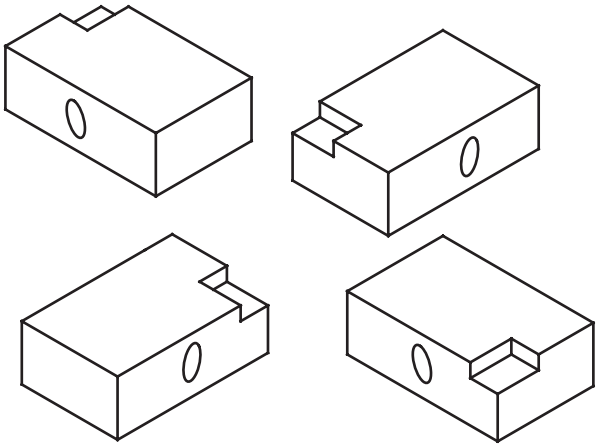


What is the overall height of the component in mm?

(1)

.....

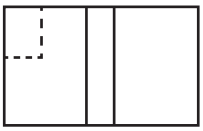
(e) These are views of a component used by Launch Engineering Ltd in the manufacture of aircraft.



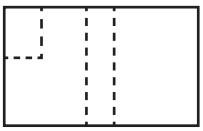
Which is the correct plan view?

(1)

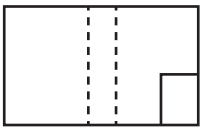
☒ **A**



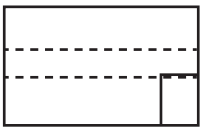
☒ **B**



☒ **C**



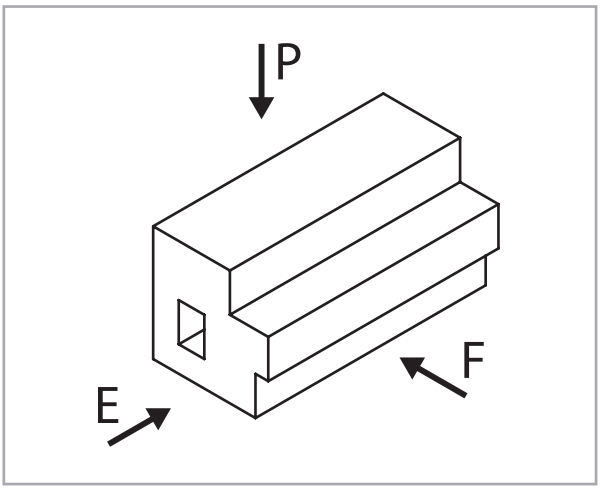
☒ **D**



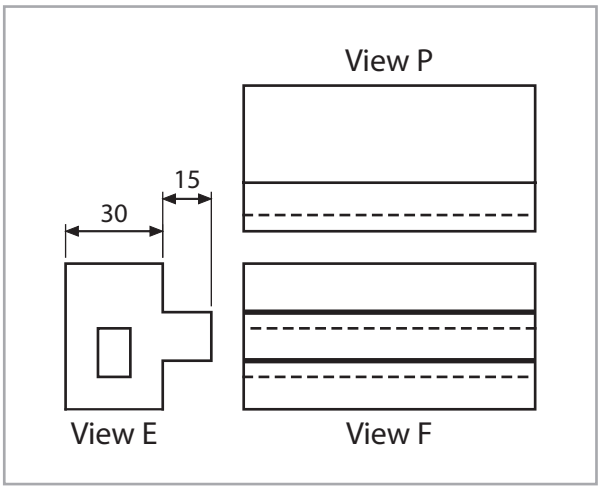
Members of a sub-assembly team need to check drawings carefully to make sure they are complete and accurate.

(f) Drawing A and Drawing B show the same aircraft component but Drawing B has errors and omissions. For example, some of the dimension lines are missing.

Drawing A



Drawing B



Other than missing dimension lines, identify **two** other errors in Drawing B.

(2)

1 .....

.....

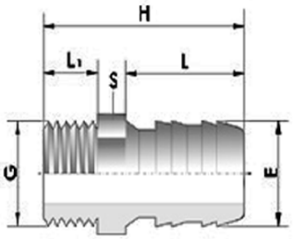
2 .....

.....

(Total for Question 3 = 12 marks)

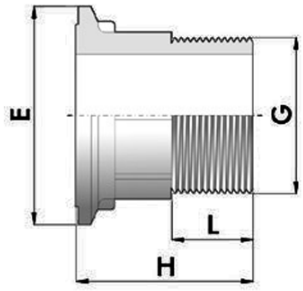
4 Product manufacture often involves male and female components. These dimensional drawings show a male and female component.

Male spigot



10mm
+ 0.00, – 0.05

Female bush



10mm
+ 0.05, – 0.00

(a) What is the minimum diameter of the male component?

(1)

.....

(b) Tolerances show the maximum and minimum acceptable measurements in manufacture.

Explain **two** other considerations an engineer must take into account with tolerances in the production of male and female components.

(4)

1 .....

.....

.....

2 .....

.....

.....

(Total for Question 4 = 5 marks)

5 Boxcam Ltd manufacture gearbox cranks for surveillance cameras.

Teams in Boxcam Ltd use production plans. Here is an extract from a production plan.

Part No: 14	**Part name: Gearbox Crank**		**Material: Aluminium**		**Number Off: 1**	
Sequence	**Process**	**A**	**Speeds and Feeds**	**B**	**Quality Control Checks**	**Time**
10	Mark out material to correct length	Scriber, Engineers square, Steel rule	N/A	Be aware of sharp edges of scriber when marking out	Use steel rule to check marked lines	5 mins
20	Cut material to rough length	Hacksaw, Vice	N/A	Part could be hot, Hacksaw has sharp teeth	Check to see marked lines are still visible	5 mins
30	Mill to the correct length	Milling Machine, 10mm end mill	750RPM	Wear safety goggles and ensure guard is in position	Use verifier calipers to check measurements	8 mins

(a) What titles should be given to labels A and B in the production plan?

(2)

A .....

B .....

(b) Explain **one** advantage to Boxcam Ltd of using production plans.

(2)

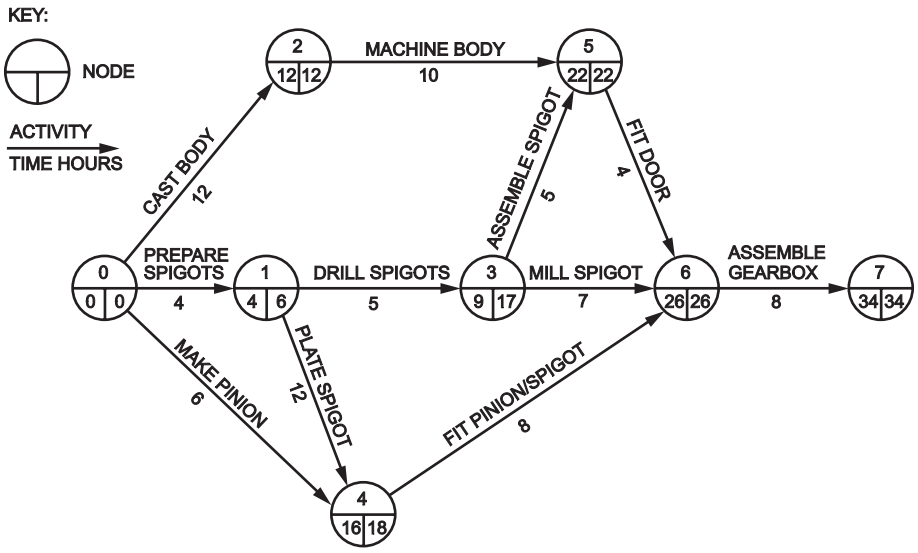
.....

.....

.....

.....

Boxcam Ltd uses critical path analysis. Here is an example of a diagram relating to the manufacture of a component in a gear box.



(c) State what is meant by the critical path.

(1)

.....

(d) State the latest start time for the process 'MACHINE BODY'.

(1)

..... hours

(e) The process 'PREPARE SPIGOTS' overruns by 3 hours.

Analyse the diagram.

Explain the impact of the overrun on the manufacturing processes for the gearbox assembly.

Your answer should make reference to the other processes in the diagram.

(3)

.....

.....

.....

.....

.....

.....

(Total for Question 5 = 9 marks)

6 Boxcam Ltd has a system of document control. Effective document control will reduce manufacturing errors and their impact.

(a) Explain **two** ways in which document control can be applied effectively.

(4)

1 .....

.....

2 .....

.....

(b) The engineering team at Boxcam Ltd are reviewing how they use GANTT charts in the production process.

Discuss the use of GANTT charts for the team of engineers.

(8)

(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 50 MARKS

General marking guidance

- All candidates must receive the same treatment. Examiners must mark the first candidate in exactly the same way as they mark the last.
- Mark schemes should be applied positively. Candidates must be rewarded for what they have shown they can do rather than be penalised for omissions.
- Examiners should mark according to the mark scheme, not according to their perception of where the grade boundaries may lie.
- All marks on the mark scheme should be used appropriately.
- All the marks in the mark scheme are designed to be awarded. Examiners should always award full marks if deserved, i.e. if the answer matches the mark scheme. Examiners should also be prepared to award zero marks if the candidate's response is not worthy of credit according to the mark scheme.
- Where some judgement is required, mark schemes will provide the principles by which marks will be awarded and exemplification may be limited.
- When examiners are in doubt regarding the application of the mark scheme to a candidate's response, the team leader must be consulted.

Question	Answer	Mark
1 (a)	A - Isometric	**(1)**

Question	Answer	Mark
1 (b)	Award 1 mark for **each** drawing type matched to the correct application. Third angle projection - Manufacturing a product (1) Isometric - Presenting to a client (1)	**(2)**

Question	Answer	Mark
1 (c) (i)	B 	**(1)**

Question	Answer	Mark
1 (c) (ii)	C 	**(1)**

Question	Answer	Mark
1 (c) (iii)	A linked response, award 1 mark for identifying the advantage and 1 mark for the explanation, up to a maximum of 2 marks: Any **one** from: • Shows universally recognised symbols (1) so that they are in an easy to follow format (1) • Shows a simplified diagram in sufficient detail (1) so that it can be constructed easily/built accurately time and time again (1) • Shows all the electronic parts (1) and how they are interconnected in an easy to follow format (1) • Allows anyone who knows how to interpret the diagram (1) has the information to construct it in its practical form (1) **Accept any other appropriate alternatives.**	**(2)**

Question	Answer	Mark
2 (a) (i)	Award 1 mark for any of the following responses: Any **one** from: • Eye protection must be worn (1) • Must wear safety glasses/goggles (1) **Accept any other appropriate alternatives.**	**(1)**

Question	Answer	Mark
2 (a) (ii)	Award 1 mark for **each** of the following responses, up to a maximum of 2 marks: Any **two** from: • Extinguish any naked flames (1) • Ensure awareness of where fire fighting equipment is situated (1) • Wear clothing/shoes that won't spark (1) **Accept any other appropriate alternatives.**	**(2)**

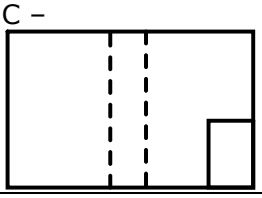
Question	Answer	Mark
2 (b)	Award 1 mark for **each** of the following responses: B - Power consumption (1) D - Supply voltage (1)	**(2)**

Question	Answer	Mark
3 (a)	A linked response that makes reference to the following points. Up to 2 marks for **an** explanation. • To monitor performance of machine/ to check that components will be within tolerance/so that trends in performance/sudden variations can be easily seen/detected (1) so that any problems or trends can be rectified (1) **Accept any other appropriate alternatives.**	**(2)**

Question	Answer	Mark
3 (b)	A linked response, award 1 mark for identifying the limitation and 1 mark for the explanation. Up to 2 marks for **each** response, up to a maximum of 4 marks. • SPC relies on spot check sampling / SPC is not an ongoing automated process (1) because it does not measure all the time quality deviations may be missed/ because human error may occur in recording /because of the lag time deviation may get worse before being identified(1) • If processes fluctuate without showing a clear trend then SPC would not require intervention (1) but components may be outside required tolerances between samples (1) **Accept any other appropriate alternatives.**	**(4)**

Question	Answer	Mark
3 (c)	Award 1 mark for **each** of the following, up to a maximum of 2 marks: Any **two** from: • Date (1) • Version number (1) • Drawing title (1) • Owner of drawing (1) • Company name (1)	**(2)**

Question	Answer	Mark
3 (d)	50mm	**(1)**

Question	Answer	Mark
3 (e)	C – 	**(1)**

Question	Answer	Mark
3 (f)	Award 1 mark for **each** error identified from the following errors, up to a maximum of 2 marks: Any **two** from: • Line drawn underneath the protrusion is showing incorrect length on view E (1) • Hidden detail of the hole missing in view P (1) • Incorrect line thickness used on view F (1)	**(2)**

Question	Answer	Mark
4 (a)	9.95mm	**(1)**

Question	Answer	Mark
4 (b)	A linked response, award 1 mark for identifying the consideration and 1 mark for the explanation. Up to 2 marks for **each** response, up to a maximum of 4 marks. Any **two** from: • The type of inspection technique that would need to be used (e.g. no go/go gauge) (1) because a narrow tolerance will require a very accurate inspection technique (1) • The type of manufacturing technique necessary/surface finish (1) because a narrow tolerance will need a manufacturing process that can be very accurate/produce a very smooth surface finish (1) • The type of fit required (e.g. interference, pipe) (1) because a narrow tolerance will indicate that a resistance fit is the method of fitting (1) • The manufacturing time (1) because a narrow tolerance will take a long time to achieve as machines would need to produce the finish in stages/allow time to cool down between phases (1) **Accept any other appropriate alternatives.**	**(4)**

Question	Answer	Mark
5 (a)	Award 1 mark for **each** label provided: A – Equipment and tools (1) B – Health and Safety (1) **Accept any other appropriate alternatives.**	**(2)**

Question	Answer	Mark
5 (b)	A linked response, award 1 mark for identifying the advantage and 1 mark for the explanation, up to a maximum of 2 marks: Any **one** from: • Ensures operator follows the correct procedure (1) as machining operations are usually in a logical order (1) • Speeds up manufacturing process (1) as processes/tools/equipment/materials can be prepared earlier(1) • provides safety guidance (1) as PPE and risks are identified on the plan (1) • It gives quality engines to the customer (1) as the engines go through scheduled quality checks (1) • It tells the engineer what materials and processes to use (1) to ensure the part of the engine is made to the specification (1) • Allows machine use to be scheduled (1) to allow for better utilisation (1) **Accept any other appropriate alternatives.**	**(2)**

Question	Answer	Mark
5 (c)	Award 1 mark for definition along the lines of: The longest necessary path through a network of activities when respecting their interdependencies **Accept any other appropriate alternatives.**	**(1)**

Question	Answer	Mark
5 (d)	12 hours	**(1)**

Question	Answer	Mark
5 (e)	Up to 3 marks in total for a full explanation which covers the following **three** areas: Award 1 mark for identifying the **two** activities immediately impacted upon: • 'DRILL SPIGOT' and 'PLATE SPIGOT' would also overrun (for 3 hours). (1) Do **not** accept answers such as: • All processes are delayed • 'ASSEMBLE GEARBOX' is delayed Award 1 mark for justification of how the critical path is affected: Any **one** from: • "Drill Spigot " is not on the critical path and is not affected (1) • The critical path is Cast Body, Machine body, and Fit Door (1) Award 1 mark for extension on how the critical path has altered (time might be indicated) • The critical path would change to include 'MILL SPIGOT' and the overall additional time required is 35 hours/1 hour more (1) **Accept any other appropriate alternatives.**	**(3)**

Question	Answer	Mark
6 (a)	A linked response, award 1 mark for identifying the application and 1 mark for the explanation. Up to 2 marks for **each** response, up to a maximum of 4 marks. Any **two** from: • To ensure everyone is using the correct version of documents/to quarantine obsolete documents /so the master list of documents is always current (1) so that the company can maintain quality assurance accreditation / so that all the stages of production are conducted correctly without errors being passed on to the next stage (1) • To ensure access to all previous versions of documents (1) so that corrective action can be identified and taken /for product recalls or quality checks (1) • To ensure that all relevant or responsible persons are consulted during version changes (1)/ so that processes can be improved /so that changes are only introduced when fully authorised (1) **Accept any other appropriate alternatives.**	**(4)**

Question	Indicative Content	Mark
6 (b)	Reasons for the use of Gantt charts: • Can show simultaneous activity • Has date lines • Effective in resource allocation • Allows accurate monitoring of process • Highlights areas that are a risk to the overall completion • Critical path can be monitored (but see below) Reasons against the use of Gantt charts: • They can remain static and therefore out of date • They can be very complex • Critical path is difficult to establish without reference to other documents • To the untrained eye can be difficult to interpret information contained and therefore is difficult to communicate to others **Accept any other appropriate alternatives. Apply the levels mark scheme below.**	**(8)**

Level	Mark	Descriptor
	0	No material deserving of reward
1	1-3	Basic argument on both sides identified, or only one side considered. The answer is likely to be in the form of a list. Points made will be superficial/generic and not applied/directly linked to the situation in the question. No conclusion produced or conclusion a consequence of only one side of the argument being considered.
2	4-6	Arguments for and against are described, but there will be more emphasis on one side that the other. The answer will be unbalanced. A conclusion is present, but this is either implicit or as a result of unbalanced consideration of the arguments. There is a little or unfocused justification of the question, but the link will not always be clear.
3	7-8	Balanced explanation of both sides for and against. A conclusion is produced which is justified and clearly linked to the consideration of arguments for and against, and their relative importance to the situation. The majority of points made will be relevant and there will be a clear link to the situation in the question.

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ENGINEERING

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