

Candidate 7 evidence

Total marks — 90
Attempt ALL questions

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1. Graphics of a new blender are shown below in Figures 1 and 2.

Figure 1

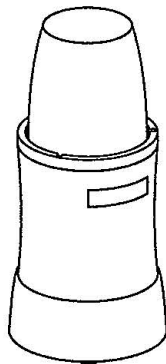


Figure 2



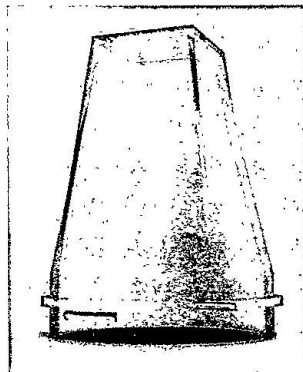
- (a) Describe two illustration/3D rendering techniques applied to produce the realistic looking graphic shown in Figure 2.

2

Texture/material - makes object shine if
metallic like on base of blender

Lighting - adding lighting to create a shadow
to make object look more realistic

- (b) An alternative design is shown below for the plastic cup component. The CAD technician decides to produce this component in two stages.



Alternative cup design

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1. (b) (continued)

- (i) You must use the additional information provided on the supplementary sheet for use with question 1 (b) (i) to answer this question.

Describe, using 3D CAD modelling techniques, how the technician would complete Stage 1 as shown in the working drawings.

6

You may use sketches to support your answer.

A diameter 113 profile would be sketched and be extruded 4mm up

On the new extruded surface a diameter 105 circle would be sketched & be extruded 10mm up

A new working plane would then be offset 110mm from the new extruded $\varnothing 105$ circle and a 50x50 square would be sketched on it.

Lofts would then be used to connect the $\varnothing 105$ & the 50x50 square. *

A shell of 4mm would then be used on the base of the component, hollowing out the inside.

*(Before the shell) a $\varnothing 46$ circle would be sketched on the base of the ~~sketch~~ component & then extruded 4mm, subtracting from the component.

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1. (b) (continued)

- (ii) You must use the additional information provided on the supplementary sheet for use with question 1 (b) (ii) to answer this question.

The CAD technician adds additional features to allow the lid to lock into position, shown in red in Stage 2.

Describe how, using only the 'revolve' 3D modelling technique, the CAD technician created the additional features.

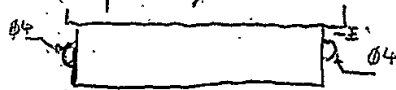
5

A 14 by 4 rectangle would be sketched on the vertical plane at the edge of the component.



This would then be revolved around 360° around the centre axis.

On the vertical plane a ~~circle~~ semi-circle of diameter ~~4~~ 4 would be drawn off on either side of the component, (from below the original component).

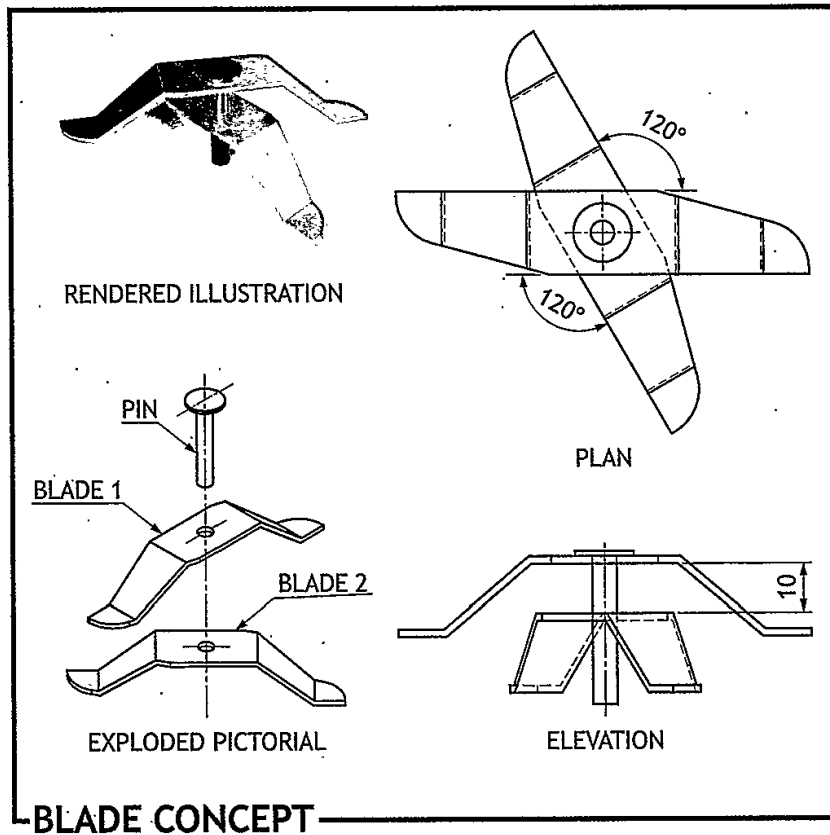


Both of these would be revolved 30° around the centre axis in a clockwise direction.

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1. (continued)

- (c) A concept design for the blade sub-assembly for the blender is produced. The two blades shown have been constrained to the pin using 3D CAD modelling software.



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1. (c) (continued)

Describe the steps required to constrain the blades and pin to each other. You may annotate Figure 1 to help with your answer.

4

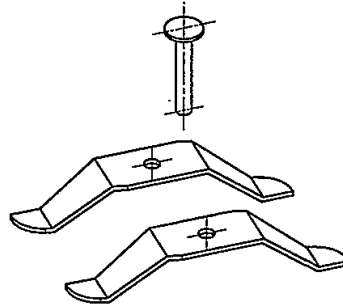


Figure 1

Both blade ~~one~~ 2 holes would be aligned with the pin. Blade 1 would then be ~~with~~ ^{matched} with the underside of the pin. A dimension constraint could then be ~~add~~ ^{used} to ~~add~~ ^{the blade 2 10mm} constrain blade 2 10mm below Blade 1. Blade 2 would also be constrained 120° around from blade 1

3. A graphic designer is producing content for Scotrock, a new Scottish music festival. The logo designs below are exported as vector files.

Version 1



Version 2



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- (a) (i) Describe two advantages of exporting the logo shown in the vector format, as opposed to raster.

2

The image can be scaled with no
loss of quality.
Smaller file size so will take up less
virtual storage space

- (ii) State the name of a vector file extension which the logo could be exported as.

1

.svg

- (iii) The graphic design company operate a paperless office. Describe two advantages for the company of operating a paperless office. Do not include environmental benefits from reduced paper.

2

Takes up less actual storage space
Files can be easily shared and
accessed digitally

[Turn over

3. (continued)

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A draft graphic for the festival security passes is shown above.

- (b) (i) Describe two instances where the designer has used line to enhance the layout of the graphic. 2

The line ^(column Rule) between occupation/pass type & the general ~~information~~ ^{details} splits the pass up making it easier to read. Also in the details the double underline emphasises & splits up the text

- (ii) Describe two instances where the designer has used alignment in the graphic. 2

Aligned all the details on the r-hand side with each other

Aligned the "Pass"/"Artist" with the symbol underneath with the upward triangle.

- (iii) Explain how the designer has used balance in the graphic. 2

Used an slightly offset vertical line to split page and make it seem more balanced. Also having the centre in the middle of the page splitting the title evenly "SCT" "RCK"

3. (b) (continued)

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- (iv) Describe two instances where the designer has created contrast in the graphic.

2

Reverse text, white text on coloured background
 makes text stand out

Using very different typefaces to make
 certain words stand out

- (c) The designer presents a proposal for a bus timetable design as shown below.



- (i) State two advantages of using a sited environment when presenting desktop publishing work to clients.

2

To show what the product will look like
 when in place

Creates a perfect world with no imperfections,
 making the ~~copy~~ product more appealing.

- (ii) The festival organisers decide to use digital screens to display the bus timetable instead of printing them. Describe three advantages to the festival organisers of using digital screens over traditional printed timetables.

3

- Saves on paper & printing costs.
- Any changes can be made easily.
- Many graphics can be used to draw
 peoples attention.

3. (continued)

MARKS	DO NOT WRITE IN THIS MARGIN

(d) You must use the graphic provided on the supplementary sheet for use with question 3 (d) to answer this question.

- (i) Describe how the designer has used texture to enhance the impact of the graphic.

2

Used metallic texture, to make the graphic to appeal to rock fans as metal could be associated with heavy metal & rock.

- (ii) Describe two ways the designer has used depth within the publication.

2

- Using a drop shadow on sub headings for shuttle services ("VIP shuttle services")
- By also having the "VIP shuttle services" overlap the metal behind creating depth.

- (iii) Describe two ways the designer has used emphasis within the publication.

2

By using the purple colour for "You're here" which only appears in the top graphic making it stand out. By using varying shades of blue to emphasize certain "packages" (where the Bronze Silver Gold packages are being described).

- (iv) Describe two ways the designer has used unity within the publication.

2

By using the same colour scheme; Blue Black & Purple.
By repeatedly using triangular shapes throughout the graphics.

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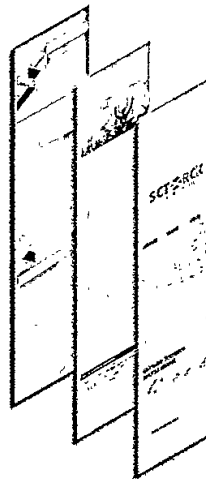
3. (d) (continued)

- (v) Explain two ways the designer has used grid structure within the publication.

2

By splitting the ^{"Packages"} ~~pages~~ up into columns with
gutters in between.
They will be text and the text will
align with each other

The layout was produced using layers in desktop publishing software.



- (vi) Describe two advantages to the graphic designer of using layers to produce this layout.

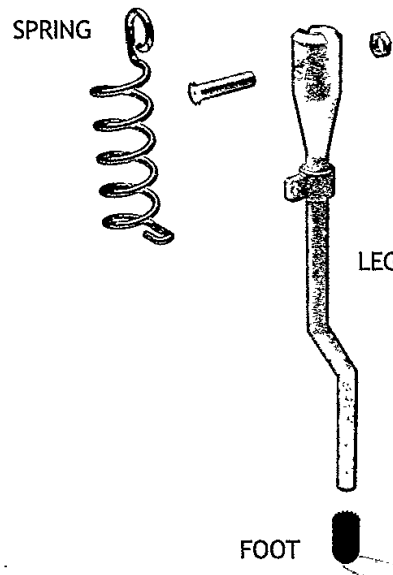
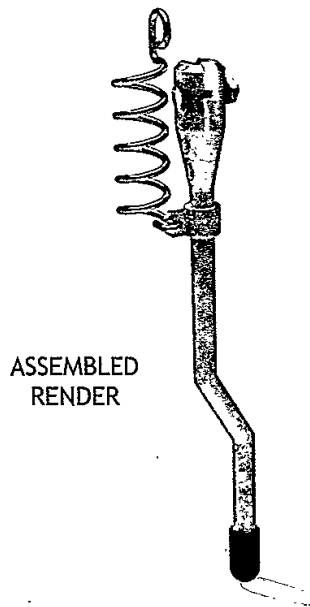
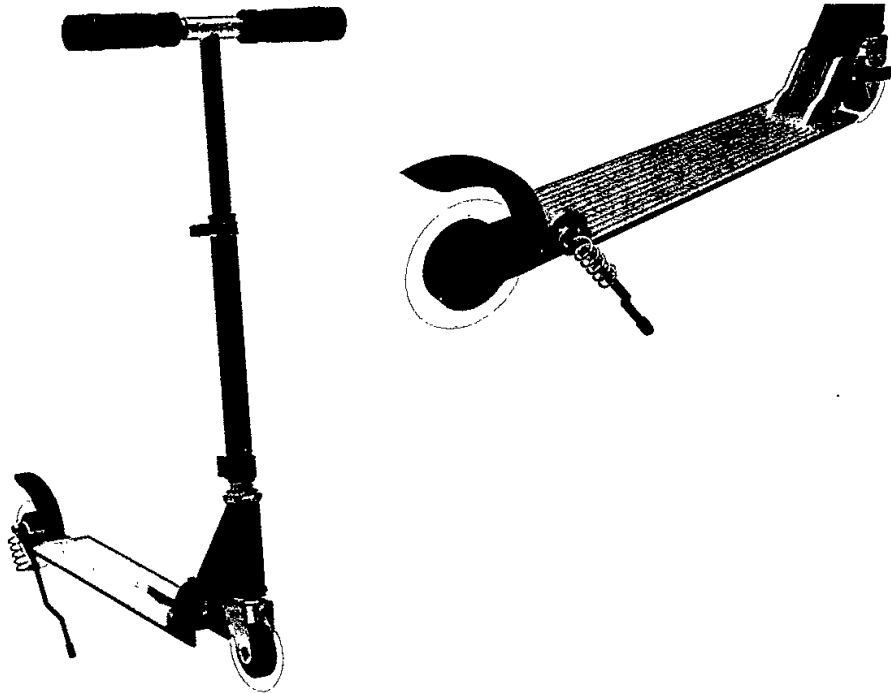
2

• can easily create depth
• if a change is needed it won't affect
the other layers on the graphic.

[Turn over

4. Parts for a retractable kickstand for a scooter are shown below.

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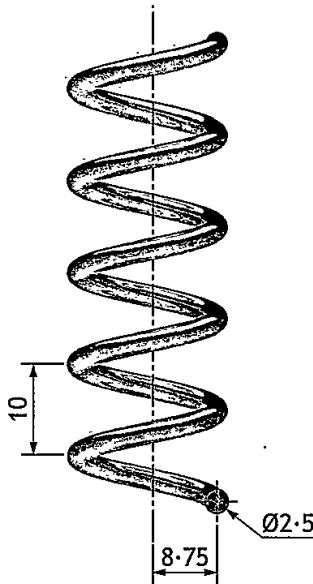


4. (continued)

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- (a) The spring was modelled as a separate component using 3D CAD.
Describe the 3D CAD modelling technique used to model the spring:
You must make reference to the dimensions given.
You may use sketches to illustrate your answer.

3



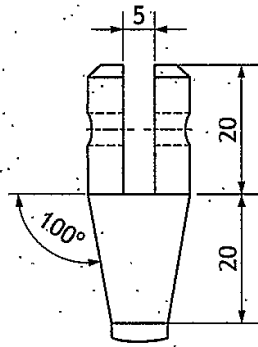
A diameter 17.5 ~~mm~~ circle would be sketched
A Helix would then be created with the parameters of it having 5 revolutions, a height of 50mm and a radius of 2.5 for the Helix coil.

4. (continued)

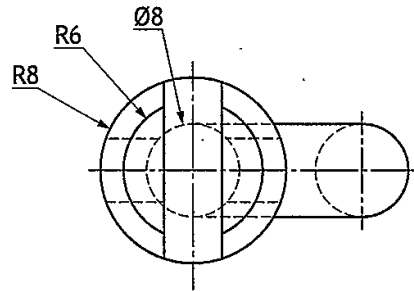
- (b) The leg was 3D CAD modelled as a single component.
 Describe the modelling techniques used to generate the component.
 You may use sketches to illustrate your answer.

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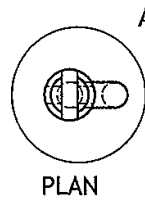
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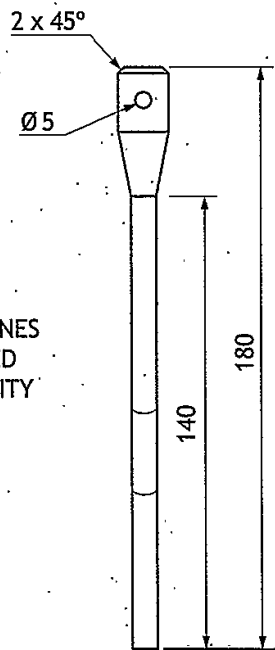
DETAIL VIEW B
 (1:1)



DETAIL VIEW A
 (2:1)

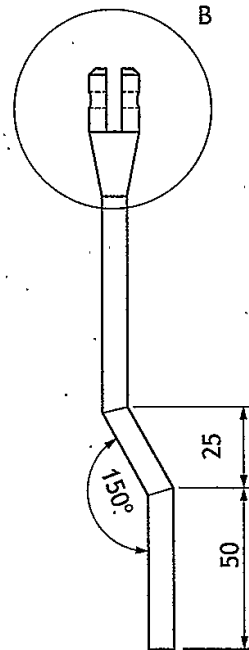


PLAN



CENTRE LINES
 REMOVED
 FOR CLARITY

END ELEVATION



ELEVATION

SCALE 1:2

4. (b) (continued)

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A diameter 8 circle would be sketched a path perpendicular to the centre of this circle would then be drawn up 50mm then at an angle of 30 degrees from the vertical of a ~~50mm~~ ^{28.67mm} line would be drawn (vertical distance of 25mm at 30°)



- A 65mm line would then be drawn vertically from this
- Extrude along a path could then be used to create the leg. From the top of the extruded leg a ~~new~~ ^{new} plane would be offset 20mm and a $\phi 16$ circle would be drawn.
- Igher would be used between the top of the leg and the new ~~new~~ $\phi 16$ circle
- The $\phi 16$ circle would then be extruded 20mm, & a 2mm chamfer applied to the top of it.
- A 5x20 section would be subtracted from this top part
- Finally a $\phi 5$ circle would be ~~subtracted~~ ^{subtracted} ~~removed~~ ^{perpendicularly} to the 5x20 section

4. (continued)

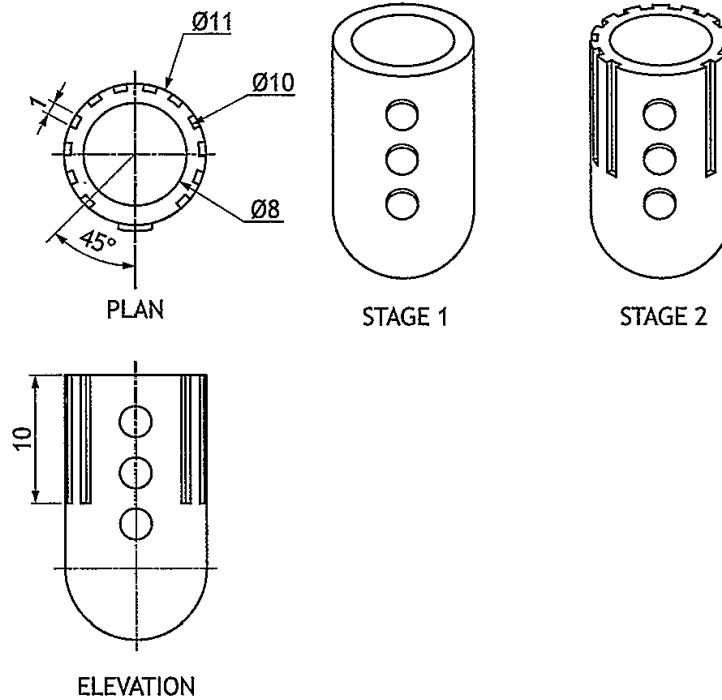
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(c) The foot was 3D CAD modelled using the revolve command.

Describe the modelling edit used to complete the component from Stage 1 to Stage 2.

You may use sketches to illustrate your answer.

3

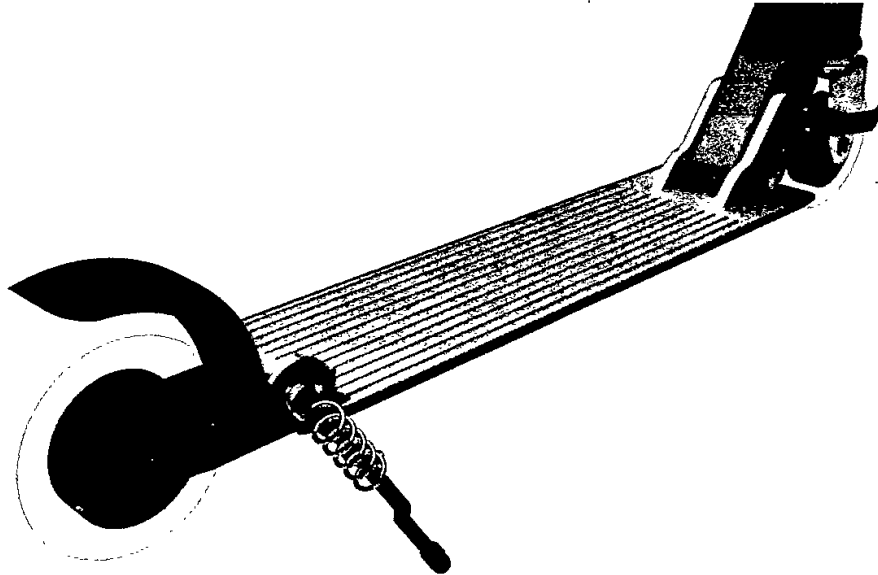


Radial array would be used by sketching a $\phi 10$ circle and creating 1x1 boxes between the $\phi 10$ and $\phi 11$ (this box would be drawn at 45° away from the 3 vertical holes). This box would then be extended down 10mm subtractively from the original component. A radial array would then be used to repeat this 12 times around 360° of the component. (Around centre point)

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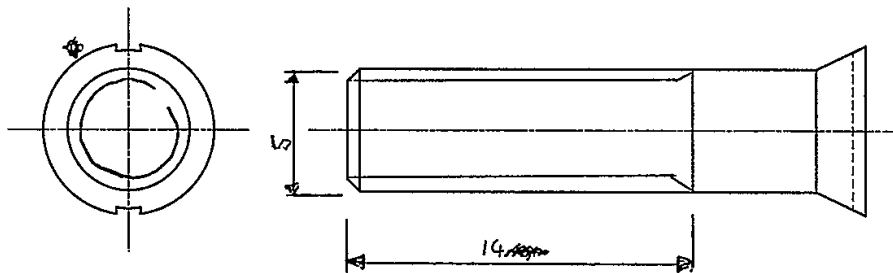
4. (continued)

The kickstand is connected to the scooter by an M5 countersink head screw. The length of the thread is 14mm.



(d) Apply to the views below the correct British Standard conventions for

- (i) the diameter of the bolt 1
- (ii) the length of the thread 1
- (iii) the convention for a thread. 2



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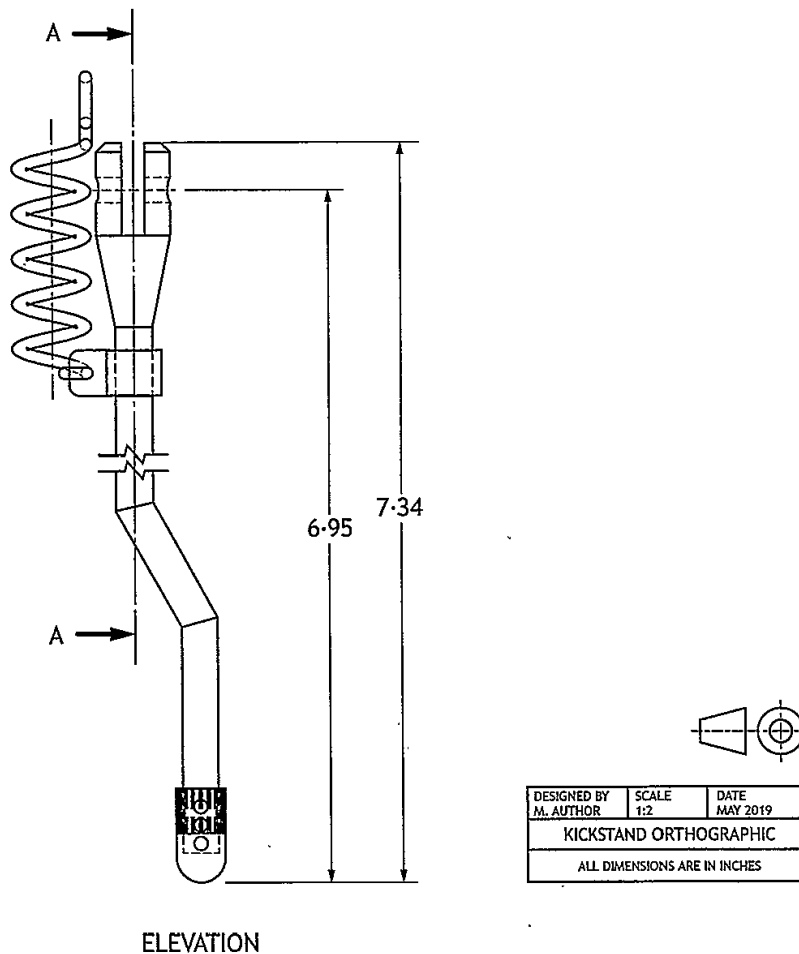
4. (continued)

(e) The assembly technician downloads an orthographic drawing from the company network. The technician immediately notices some issues with the drawing.

Identify from the drawing, five errors which are not correct to British Standard conventions.

5

- Bottom of stand fully black, cant see detail
- Dimensions are in inches
- ~~Shortened~~ Shortened lengths on dimensioned surfaces
- 3rd angle projection symbol not in box
- Not all circular parts have centre lines



5. A design company has produced a range of graphics for a music festival.
During the planning process three of the graphics were submitted.

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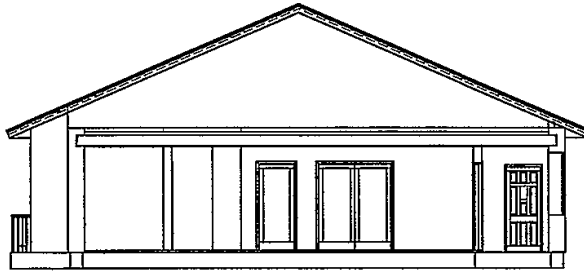


Figure 1

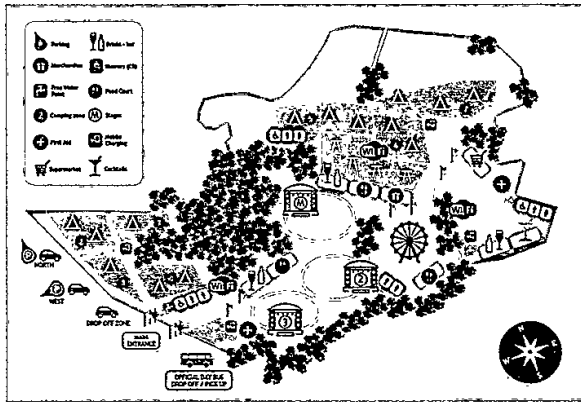


Figure 2

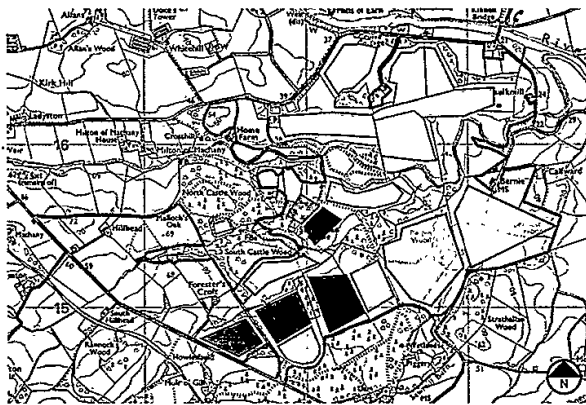


Figure 3

5. (continued)

- (a) Explain, with reference to preliminary, production and promotional graphics, the purpose of Figures 1, 2 and 3.

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Figure 1.

Production - to accurately show how the building will be built with dimensions & hatched details

Figure 2

Promotional - to show off & promote what's there, not necessarily accurately or to scale

Figure 3

Preliminary - To roughly plan where things will be, to get a rough idea of what it will look like

- (b) State three features which should be shown on a British Standards location plan.

3

North sign

Contours

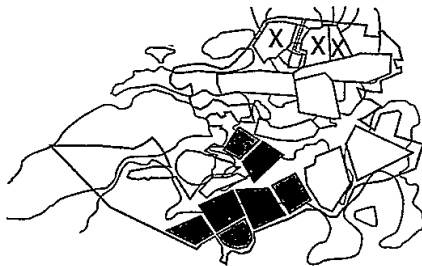
Existing trees

5. (continued)

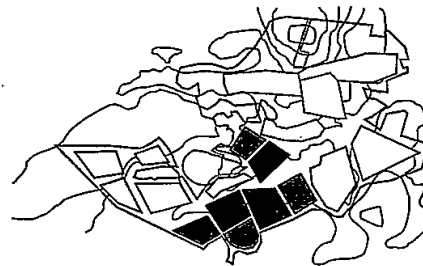
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(c) Changes, shown in the Proposed Plan and Final Plan, were made during the planning stage. With reference to the graphics below, identify two reasons the camping areas marked with an X have been relocated.

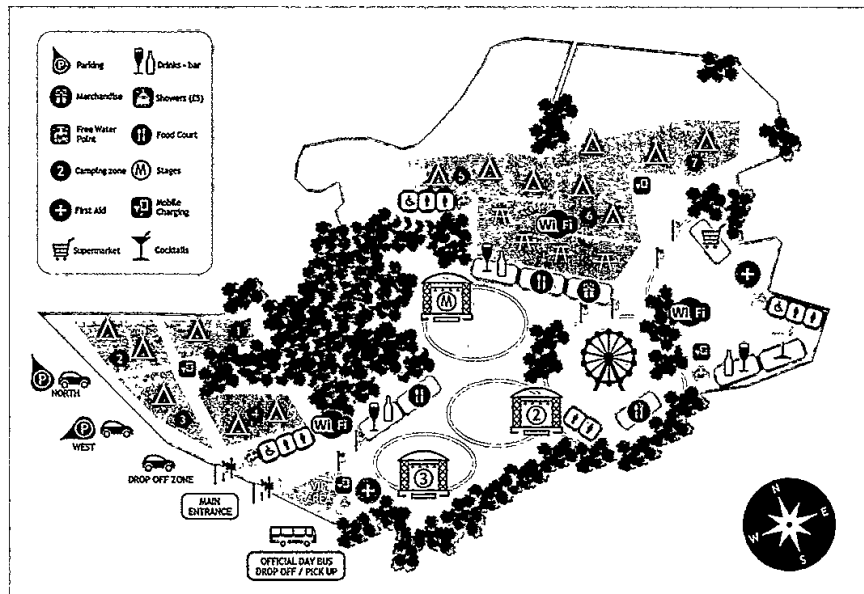
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PROPOSED PLAN



FINAL PLAN

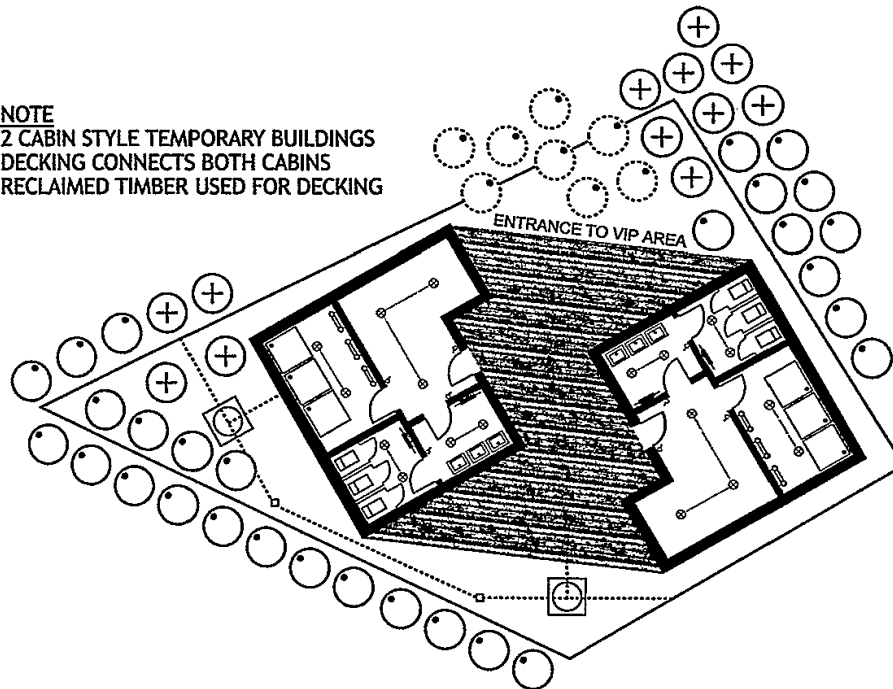


• They were on a steep slope
 • Next to a large river that could potentially flood

5. (continued)

The site plan for the VIP area is shown below.

NOTE
2 CABIN STYLE TEMPORARY BUILDINGS
DECKING CONNECTS BOTH CABINS
RECLAIMED TIMBER USED FOR DECKING



Architects had to plan around the existing environment, to create two temporary buildings and an outdoor wooden decking area.

- (d) State how many existing trees are within the VIP boundary.

1

5

- (e) The site plan shows some existing trees had to be removed.

State a reason why this was necessary.

1

Because they were ~~obstructing~~ in the way of
the entrance.

- (f) Describe how the architect has considered the environmental aspect of the site.

2

They have fitted the buildings as best they
could around the existing trees. Any trees
being cut down 1:5x the amount cut have
been replanted. ^{decaying} Cabins are also made from reclaimed timber

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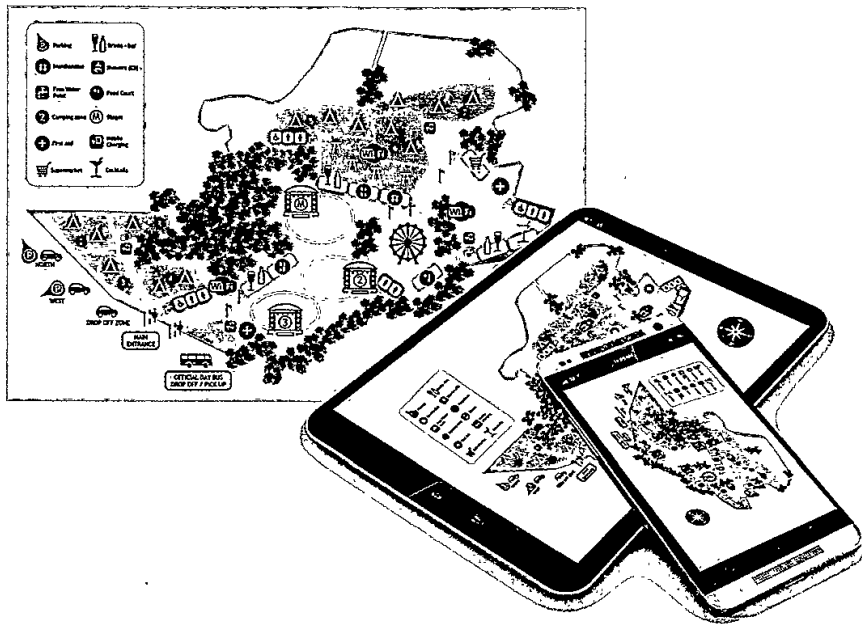
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5. (continued)

(g) State two factors that influence the choice of scale in a floorplan.

2

• Size of paper / page that its on
• How detailed the plan needs to be



(h) The company plans to have both a hardcopy and electronic version of the festival site plan as shown above.

2

State two things that the designer would have to consider when making the site plan suitable for a range of electronic devices.

How the plan will scale on different devices of different sizes
That different operating systems may only open certain file types

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5. (continued)

- (i) The company has set up a website and social media link for the event, allowing festival goers to connect with fellow attendees and those not in attendance.

Describe why the companies promoting and advertising the event may like this live link.

Adverts can say you can always keep in touch with people at the festival, to make sure they're safe.

Makes it easier for people to find their friends while at the festival, making festival seem more attractive.

[END OF QUESTION PAPER]