Instructions

- Use black ink or ball-point pen.
- If pencil is used for diagrams/sketches it must be dark (HB or B). Coloured pens, pencils and highlighter pens must not be used.
- Fill in the boxes at the top of this page with your name, centre number and candidate 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 80.
- The marks for each question are shown in brackets – use this as a guide as to how much time to spend on each question.
- Questions labelled with an asterisk (*) are ones where the quality of your written communication will be assessed – you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.

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.
Answer ALL the questions.

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 Which one of the following materials is most suitable for use as a fruit juice container?

☐ A Tetra Pak™
☐ B Corrugated board
☐ C Solid white board
☐ D Folding box board

(Total for Question 1 = 1 mark)

2 Which one of the following pieces of personal protective equipment (PPE) should be worn when using Tensol® cement?

☐ A Safety boots
☐ B Leather apron
☐ C Goggles
☐ D Ear defenders

(Total for Question 2 = 1 mark)
3 Which one of the following methods has been used to join together the pages of the booklet shown below?

- A Spiral/comb binding  
- B Perfect binding  
- C Hard-binding  
- D Saddle-wire stitching  

(Total for Question 3 = 1 mark)

4 Which one of the following processes has been used to make the one-off plastic photo frame in the school workshop?

- A Blow moulding  
- B Vacuum forming  
- C Line bending  
- D Injection moulding  

(Total for Question 4 = 1 mark)
5. Which piece of technical drawing equipment should be used to construct an isometric drawing?

- [ ] A Circle template
- [ ] B A 30 / 60 degree set square
- [ ] C A 45 degree set square
- [ ] D A flexicurve

(Total for Question 5 = 1 mark)

6. Thermochromic film will respond to which one of the following conditions?

- [ ] A Changes in light
- [ ] B Changes in sound
- [ ] C Changes in heat
- [ ] D Changes in a magnetic field

(Total for Question 6 = 1 mark)

7. Which one of the following statements describes the process of laminating?

- [ ] A Makes paper more flexible
- [ ] B Heat seals paper with clear plastic
- [ ] C Cleans paper ready for printing
- [ ] D Inserts a watermark into paper

(Total for Question 7 = 1 mark)

8. Which one of the following statements describes stereolithography?

- [ ] A The enlarging of a photograph
- [ ] B The cutting of MDF
- [ ] C A type of rapid prototyping
- [ ] D A two colour printing technique

(Total for Question 8 = 1 mark)
9 Which one of the following would be most suitable for printing images on a batch of 100 mugs?

- A Offset lithography
- B Flexography
- C Gravure
- D Screenprinting

(Total for Question 9 = 1 mark)

10 Which one of the following statements about e-paper (electronic paper) is NOT true?

- A Easily read at an angle
- B Uses very little power
- C Can be read in bright light
- D Produces electricity from the Sun

(Total for Question 10 = 1 mark)
11 (a) The table below shows some tools, components and equipment.

Complete the table below by giving the missing names and uses.

<table>
<thead>
<tr>
<th>Tools/Components</th>
<th>Name</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>French curve</td>
<td></td>
<td>(1) Used to draw any angle between 0° and 90°</td>
</tr>
<tr>
<td>RFID Tag</td>
<td></td>
<td>(1) Rapid removal of soft materials</td>
</tr>
</tbody>
</table>
(b) The drawings below show two acrylic signs for the changing rooms in a school.

![Acrylic sign diagram]

(i) Give two reasons why acrylic is a suitable material for the signs.

1. ..........................................................
2. ..........................................................

(ii) Give three reasons why signs often have graphic symbols rather than words.

1. ..........................................................
2. ..........................................................
3. ..........................................................

(iii) One method of producing the graphic symbols for an acrylic sign is by using a vinyl cutter.

Give two other methods of producing the graphic symbols for an acrylic sign.

1. ..........................................................
2. ..........................................................
(iv) Explain two advantages of making the graphic symbols on a vinyl cutter rather than producing them by hand.

1. ..........................................................................................................................
2. ..........................................................................................................................

(c) The manufacturer of the door signs uses the internet for marketing and sales, which allows customers to design their own door signs.

Describe two advantages for the customer of using the internet to design their own door signs.

1. ..........................................................................................................................
2. ..........................................................................................................................

(Total for Question 11 = 19 marks)
The hollow chocolate egg shown below is to be promoted with a new package. The egg will be wrapped in plain foil for protection and hygiene.

The specification for the package is that it must:

• hold the egg upright
• allow the egg to be seen
• have a closable lid
• show a graphic image to reflect an egg theme
• allow it to be hung up on display in a shop
• use a recyclable material
• use a commercial method of printing
• use a commercial finishing technique.

In the spaces opposite, use sketches and, where appropriate, brief notes to show two different design ideas for the promotional material that meet the specification points above.

Candidates are reminded that if a pencil is used for diagrams/sketches it must be dark (HB or B).

Coloured pens, pencils and highlighter pens must not be used.

PLEASE DO NOT WRITE OR DRAW IN THIS SPACE.
PLEASE USE THE SPACES OPPOSITE FOR YOUR DESIGNS.
Design idea 1

(8)

Design idea 2

(8)

(Total for Question 12 = 16 marks)
13 The drawing below shows a hand held collection container made from polyvinyl chloride (PVC).

(a) Give two properties of PVC that make it suitable for the collection container.

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

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

(b) Describe one reason why PVC is a better choice of material for the collection container than steel.

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(c) The collection container was designed using CAD software.

Describe one advantage of using a CAD system to design the hand held collection container.

(2)

(d) Explain why the container is successful in meeting the following specification points:

(i) keeping the money inside secure

(2)

(ii) fitting comfortably in the hand.

(2)
(e) The drawings below show two different types of charity collection container.

container A
Injection moulded in PVC

container B
Carton board flat pack box
Evaluate **container A** and **container B** in terms of form and performance requirements.

(Total for Question 13 = 16 marks)
14 The drawing shows a pictorial view of an architectural model.

The walls have been made from jelutong.

(a) (i) Give **two** advantages of using jelutong to make the walls of the model.  

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

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

(ii) Styrofoam™ is often used for modelling 3D graphic products.

   Explain **two** advantages of using Styrofoam™ to model 3D graphic products.  

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

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

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(b) Architectural models are made as a one-off.

(i) Give **three** disadvantages of making an architectural model as a one-off. (3)

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

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

3. ..........................................................................................................................

(ii) Architectural models can now be 3D printed.

Explain **two** advantages of using 3D printing to make architectural models. (4)

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

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

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*(c) Discuss the advantages for architects of producing 3D virtual models when designing new buildings. (6)*

(Total for Question 14 = 19 marks)

TOTAL FOR PAPER = 80 MARKS