

NCFE Level 1/2 Technical Award in Engineering (603/7006/3)**Examined Assessment**Paper number: **Past paper**Time allowed: **1 hour 30 minutes**Assessment date: **Wednesday 21 May 2025**Time: **1.30pm – 3.00pm****Learner instructions**

- Use black ink.
- Answer **all** questions.
- Read each question carefully.
- You **must** write your responses in the spaces provided.
- You may do rough work in this answer book. Cross through any work you do not wish to be marked.
- If you use a supplementary answer booklet, you must add your learner name, learner number and centre number to the front cover of the booklet. Insert your supplementary answer booklet inside this question paper at the end of your test.
- All of the work you submit **must** be your own.

Learner information

- The marks available for each question are shown in brackets.
- The maximum mark for this paper is **80**.
- You may use a calculator.

Do not turn over until the invigilator tells you to do so.

Please complete / check your details below

Learner name:

Centre name:

Learner number:

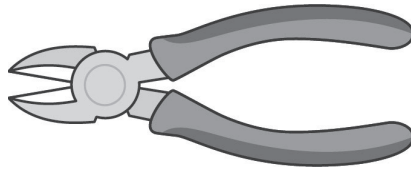
Centre number:

Section A

This section has a possible **33** marks.

Answer **all** questions in the spaces provided.

1



Which **one** of the following tools is shown in the image above?

[1 mark]

- A** Long nose pliers
- B** Open-ended spanner
- C** Ratchet spanner
- D** Side cut pliers

Answer _____

- 2** Which **one** of the following relates to the transfer of heat from one surface to another?

[1 mark]

- A** Combustion
- B** Conductivity
- C** Flammability
- D** Plasticity

Answer _____

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3 Which **one** of the following is a thermoplastic?

[1 mark]

- A Acrylic
- B Neoprene
- C Silicone
- D Thermoset

Answer _____

4 Name **three** non-ferrous alloys.

[3 marks]

- 1 _____
- 2 _____
- 3 _____

5 (a) MDF is an example of a manufactured board.

Identify **one** other type of manufactured board.

[1 mark]

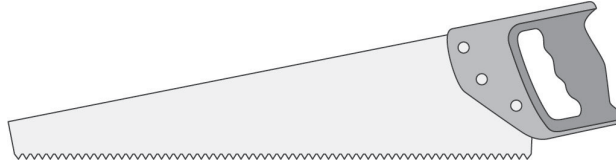
5 (b) Give **two** reasons why MDF is suitable for shelving.

[2 marks]

- 1 _____

- 2 _____

6



Name the type of saw shown in the image above.

[1 mark]

7 (a) A hydraulics system is a type of mechanical device.

Name **two** other mechanical devices an engineer might use.

[2 marks]

1

2

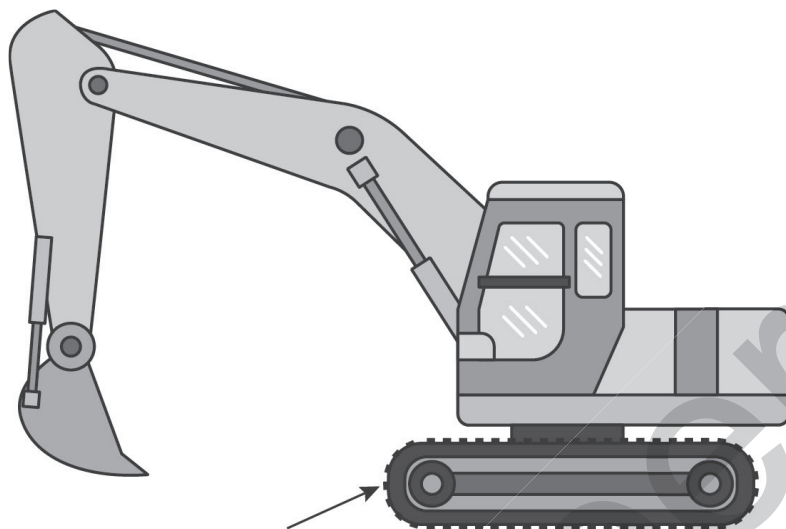
7 (b) State **one** use of hydraulics.

[1 mark]

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- 7 (c) Rubber is an elastomer used to form part of the outside of the caterpillar track shown in the image below.



Explain why rubber is suitable for a caterpillar track.

[2 marks]

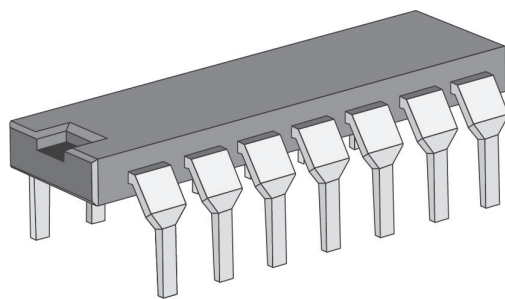
- 8 Which **one** of the following would be the most efficient for demolition work?

[1 mark]

- A Band saw
- B Jigsaw
- C Mechanical hacksaw
- D Reciprocating saw

Answer _____

- 9 The image below shows an integrated circuit (IC).



Describe the function of an IC within **two** types of devices.

[4 marks]

1 _____

2 _____

10 (a) State **two** properties of magnets.

[2 marks]

1 _____

2 _____

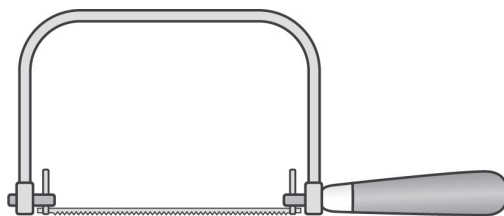
10 (b) Magnets can be used on fridges to keep the door securely closed.

Explain how magnets are used in the door seals on fridges.

[2 marks]

Please turn over for the next question.

- 11 (a) The image below shows a coping saw.



State **one** way that a coping saw can be adjusted.

[1 mark]

- 11 (b) Explain why a coping saw would be used to cut detailed shapes on a cabinet door.

[2 marks]

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- 12 Discuss why nails are used in some products, but **not** in others.

Give **one** example to support your answer.

[3 marks]

Please turn over for the next question.

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- 13** Which **one** of the following adhesives needs hardener added to it before it can be used?

[1 mark]

- A** Contact adhesive
- B** Epoxy resin
- C** Polyvinyl acetate (PVA)
- D** Super glue (cyanoacrylate)

Answer _____

- 14** Name **two** types of screwdrivers.

[2 marks]

- 1 _____
- 2 _____

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Section B

This section has a possible **14** marks.

Answer **all** questions in the spaces provided.

- 15** Which **one** of the following metal manufacturing processes uses heat?

[1 mark]

- A** Bolting
- B** Casting
- C** Drilling
- D** Filing

Answer _____

- 16** Which **one** of the following is a production planning tool?

[1 mark]

- A** BS 8888
- B** Control measures
- C** Equipment checklist
- D** Flow chart

Answer _____

- 1 _____

-

- The distance between these two stations is 195 miles and the journey time is 2 hours.

speed (s) = distance (d) ÷ time (t)

[2 marks]

Prac

- 20** A minibus has a mass of 3500 kg and travels north at a speed of 25 m/s.

Use the formula:

$$\text{momentum (p)} = \text{mass (m)} \times \text{velocity (v)}$$

Calculate the momentum of the minibus.

[2 marks]

- 21** State what amperes (amps) are used to measure.

[1 mark]

- 22** Convert 650 milliamps to amps.

[2 marks]

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- 23** State **two** activities that need to be completed to prepare materials for processing.
[2 marks]

1 _____

2 _____

Please turn over for the next question.

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Section C

This section has a possible **15** marks.

Answer **all** questions in the spaces provided.

- 24** An engineer is working on the design of an office building.

Give **two** reasons why an engineer might use isometric drawings in the design process.

[2 marks]

1 _____

2 _____

- 25** An engineer is using computer-aided design (CAD) software to design an aircraft.

The design needs to be safe, reliable and able to carry heavy loads.

The engineer is considering using finite element modelling (FEM) to help with the design.

Discuss **two** advantages of using FEM for this design.

[4 marks]

1 _____

2 _____

- 26 (a)** Orthographic projection drawings should include a range of information.



Identify what is shown by the image above.

[1 mark]

- 26 (b)** The tolerance for the value of 15 shown in the image is ± 0.1

State the minimum value that will be within tolerance.

[1 mark]

- 27** Designers often use freehand sketches when generating ideas.

These sketches may include additional elements to help designers develop the design.

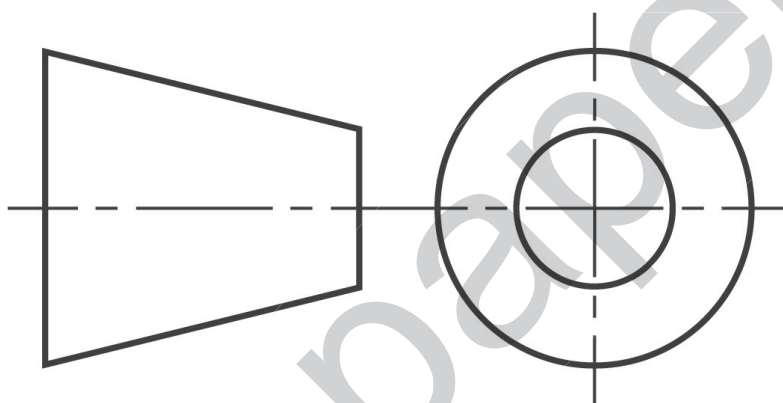
Discuss why designers might include **one** of the following additional elements:

- rendering
- annotation.

[3 marks]

- 28** Explain why it is important to use scale in an automotive engineering drawing. **[2 marks]**

- 29** The image below shows a projection symbol used in a third angle orthographic drawing of a new car.



Explain why an automotive engineer would use this projection symbol in a third angle orthographic drawing.

[2 marks]

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- [9 marks]**

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31 The modern world relies heavily on telecommunications.

This helps with almost every aspect of our lives but it can also create problems.

Analyse the advantages and disadvantages of telecommunications networks.

Support your answer with examples of how telecommunications are used.

[9 marks]

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This is the end of the examined assessment.

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