**Design & Technology**

**Machining**

**Materials required for questions**

* Pencil
* Rubber
* Calculator

**Instructions**

* Use black ink or ball-point pen
* Try to answer all questions
* Use the space provided to answer questions
* Calculators can be used if necessary
* For the multiple choice questions, circle your answer

**Advice**

* Marks for each question are in brackets
* Read each question fully
* Don’t spend too much time on one question

**Good luck!**

**Q1.** Which type of drill is shown below?

Shape

Description automatically generated

**A** Countersink

**B** Twist

**C** Masonry

**Q2.** Which turning process is shown in the diagram below?

Diagram

Description automatically generated with medium confidence

**A** Parting off

**B** Facing off

**C** Taper turning

**Q3.** Which one of the following tools is an abrading tool?

**A** Plane

**B** File

**C** Twist drill

**Q4.** Which piece of safety equipment should be worn when using a pillar-drilling machine?

**A** Ear defenders

**B** Goggles

**C** Heat protective gloves

**Q5.** A screw thread M8 x 1.2 is to be cut in a metal block. What size hole must be drilled before the thread can be cut?

**A** 9.2mm

**B** 8mm

**C** 6.8mm

**Q6.** Which one of the following processes involves the use of heat?

**A** Vacuum forming

**B** Laminating

**C** Turning

**Q7.** In which order would you drill a hole with a countersink profile for a screw?

**A** Drill, screw, countersink

**B** Countersink, screw, drill

**C** Drill, countersink, screw

**Q8.** The figure below shows the machining method of pressing, there is a label missing in the figure.

Diagram

Description automatically generated

Which one of the following is the correct label?

**A** Drill

**B** Drive centre

**C** Punch

**Q9.** Mild steel weights are turned on a centre lathe. Give **three** risks associated with turning on a centre lathe **(3 marks)**

1.

2.

3.

**Q10.** An aluminium component has been machined as part of a small batch of 50 using a milling machine. Explain **two** advantages of milling the aluminium component from a solid piece of material rather than making it from two separate pieces **(6 marks)**

1.

2.

**Q11.** A mass-produced steel front wing panel is produced using an automated machine process. The steel is supplied in roll form. Outline the process used to form the front wing panel from the steel roll **(6 marks)**

**Answers**

**Q1. A  
Q2. B  
Q3. C  
Q4. B  
Q5. C  
Q6. A  
Q7. C  
Q8. C**

**Q9**.

A maximum of **three** risks given from:

* Chuck key/work flying out (1)
* Bits flying off into your eyes / work coming out (1)
* Tie / hair /clothing getting caught (1)
* Tool banging into chuck (1)
* Cuts from swarf / waste material (1)
* Hot bits of metal / work burning you (1)
* Fingers/ hands caught/trapped/injuries (1)

**Q10**.

Any **two** of the following explanations that include identification of an advantage (1) and linked justifications of that advantage (1) + (1):

* An extra process is required (joining / welding) (1) which takes more time / more labour / more equipment / costs more (1)
* Welding produces a fillet / visible joint (1) which may compromise the shape / aesthetics / need removing (1)
* It gives a stronger component / less likely to break (1) as there is no joint / no weak point (1)
* More likely to be accurate (1) as parts do not need aligning (1)

**Q11**.

An outline covering **six** of the following:

* Steel is straightened (1)
* Steel is cut to required blank size (1)
* Blank passes through an automated feeder (1)
* Blank loaded into press / former / die (1)
* Press is activated (1)
* High pressure forces sheet steel to take the shape of the former (1)
* Die cuts / stamps out any apertures / openings / holes / outline shape (1)
* Finished pressing is removed from the machine (1)