**Design & Technology**

**Lamination**

**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 one of the following processes involves the use of heat?

**A** Lamination

**B** Vacuum forming

**C** Turning

**Q2.** Which one of the following statements is true about lamination?

**A** It is cheap to use

**B** It has a good quality finish

**C** It comes in small sheets

**Q3.** Which one of the following statements is true about lamination?

**A** It can be recycled

**B** It is lighter than solid wood

**C** It can’t be damaged by water/moisture

**Q4.** Which one of the following statements is true about lamination?

**A** It can be shaped into a curve

**B** It is a weak material

**C** Layers are not visible

**Q5.** Describe the process of forming a timber product using lamination **(6 marks)**

**Q6.** A prototype of a bridge has curved beams, which have been produced by laminating. Give **two** benefits of using lamination to manufacture the curved beam **(2 marks)**

1.

2.

**Answers**

**Q1.** B **Q2.** A **Q3.** B

**Q4.** A

**Q5.**

* Several thin layers of veneer or thin plywood (1.2mm – 3mm thickness) can successfully be combined to the required thickness (1)
* Adhesive is placed between each layer (1)
* A two part former is used and pressure applied with clamps or a press while the lamination dries (1)
* Excess adhesive from the moulding process can be removed (1)
* A bag press or vacuum bag can be used with a styrofoam mould or equivalent former (1)
* Simple curved shapes can be achieved (1)
* Cross linked adhesive or ‘cascamite’ can be used to create a stronger glued joint (1)
* Lamination can be trimmed to size once formed (1)
* Laminated products ca also be achieved by combining several sheets of kerfed flexible MDF (1)

**Q6.**

Any **two** from the following:

* Sections have increased strength / adhesive is generally stronger than timber (1)
* Thinner / shorter sections can be used / do not need long lengths (1)
* Sections can be bent more easily (1)
* Laminated curved sections require less wood than cutting the beam from solid timber (1)
* Less prone to natural faults (splits, knots, waney edge) (1)
* Beams are more stable (1)
* Beams can be made as deep as needed / not limited by timber sizes (1)
* Formers can be re-used to produce identical beams (1)
* The beam resists natural tendency to straighten (1)