

Design & Technology
AQA A-Level

Performance characteristics of woods

Materials required for questions

- Pencil
- Rubber
- Calculator

Instructions

- Use black ink or ball-point pen
- Try 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
- Try to answer every question
- Don't spend too much time on one question

Good luck!

Q1. PSE stands for 'Planed square edge'

A True

B False

Q2. PAR stands for 'Planed all round'

A True

B False

Q3. Rough sawn wood is more expensive than PAR

A True

B False

Q4. Which of the following is a softwood?

A Beech

B Birch

C Spruce

Q5. Explain why teak is an appropriate material for the manufacture of an outdoor sun lounger **(6 marks)**

Q6. Describe and explain the stages that timber undergoes from felling through to the creation of the planed square edge (PSE) stock form. **(6 marks)**

Q7. Explain why cedar is commonly used in outdoor cladding for houses **(6 marks)**

Q8. Give three reasons why a kitchen work surface may have a melamine formaldehyde layer applied **(3 marks)**

Answers

Q1. A

Q2. A

Q3. B

Q4. C

Q5.

- Teak has a naturally occurring oil that makes it resist damage and degradation associated with the sun lounger being used and left outside.
- Teak has a good level of hardness meaning it will resist the scratching and abrasion associated with it being used, moved and stored.
- The natural oils in the timber provide a good level of chemical resistance preventing the accelerated degradation of the sun lounger that may be caused by bird droppings or cleaning products.
- Teak is a naturally attractive aesthetic material that requires no additional surface finish for the sun lounger.
- Teak has a close grain pattern making the sections and profile of timber used in the chair strong enough to be suitable for accommodating the weight of the user.
- The natural oils in the teak remove the need for additional preservatives at point of manufacture to be added to the timber, reducing both production and ongoing maintenance costs.
- Teak can be successfully steam bent to create the shallow radiused sections of the sun lounger
- Teak is less prone to splinter or crack over time in the same way that alternative timbers might.

Q6.

Debarking

- The felled timber is debarked and cut into manageable lengths which are then transported to a saw mill for further processing.

Conversion

- The logs are then cut into planks in the most economical way to maximise the usable timber. This can be through and through, quarter sawn or radially sawn, depending on the intended use of the timber.

Seasoning

- The planks are then seasoned to remove the 80–90% excess moisture stored in the timber. Without the removal of this moisture, the timber is prone to splitting and warping.
- The seasoning can be either air seasoning or kiln dried seasoning.
- The air seasoning is a traditional inexpensive method where the timber is stacked outdoor but under cover with stickers placed between the planks to allow for air to circulate and the slow removal of moisture.
- Kiln dried seasoning is more expensive, where the planks are spaced and stacked on a trolley and placed in a kiln for a short period of time. Kiln dried seasoning is more controlled and produces timber particularly suitable for indoor use.

Planing

- The seasoned plank is then further processed by planing into the stock form (PSE), where the rough sawn edges are removed and a piece of timber with dimensional accuracy is produced.

Q7.

- Cedar is a quick growing softwood so very sustainable to use in building applications. Sustainability and the environmental impact used plays a significant role in most planning applications.
- Cedar has an attractive red/brown colouration when installed and as it becomes weathered it changes to a grey/silver colouration. It is chosen by many for its aesthetic qualities.
- Cedar is an excellent insulator of both sound and heat and as such makes it a suitable material to clad the exterior of buildings where heat loss and acoustic consideration are factors.
- Cedar contains natural oils which make it resistant to moisture and weathering, meaning that the cladding will be durable in an outdoor application.
- Cedar also has excellent resistance to insect attack and decay meaning that the cladding would require limited ongoing maintenance in contrast to other timbers.
- Cedar is an easy material to shape and cut. This allows cladding to be cut to size quickly and easily on site.
- Cedar has a low mass compared to other timbers. This makes the cladding easier to lift and hold when being installed.

Q8.

- Hardwearing and durable which means it resists scratching and abrasion
- Heat resistant with a high melting point so not affected by hot pans or dishes
- Can be pigmented or a printed pattern laminated beneath the surface
- Has good chemical resistance which allows it to be cleaned with detergents.