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Design & Technology
AQA A-Level

Efficient use of materials

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. Why is bulk production often cheaper per unit than one-off production?

A Lower labour skill requirements

B Economies of scale

C Reduced need for quality control

Q2. Which manufacturing strategy reduces inventory storage costs by producing goods only as needed?

A Just In Time (JIT)

B Batch Production

C Vertical In-house Production

Q3. A car manufacturer selects aluminium over steel to reduce weight without compromising strength. This reflects consideration of:

A Material cost alone

B Material characteristics and economy

C Aesthetic preferences

Q4. Automated assembly lines improve accuracy and reduce waste by:

A Increasing manual labour

B Standardising processes and minimising human error

C Using cheaper raw materials

Q5. Explain the importance of the efficient supply of materials and components in a Just In Time (JIT) manufacturing process **(9 marks)**

Q6. Explain how the use of Just In Time manufacture can improve efficiency within production **(6 marks)**

Answers

Q1. B
Q2. A
Q3. B
Q4. B

Q5.

- Components are not stockpiled so scheduled deliveries must be on time to minimise disruption to manufacture
- Delay in deliveries will affect the productivity of the manufacture, in severe cases
- Limited storage is available so stock piles must be regularly topped up and maintained
- JIT manufacture allows for flexibility on the production line so customers' orders must arrive on time and consistently in order to prevent down time
- Suppliers can be selected by proximity to the assembly plant to reduce travel time and disruption
- Machinery and layout in the factory should be optimised to allow for efficient delivery of components
- Stock is managed by computer systems
- RFID identification is used to track products through the factory and automatically select the correct parts to install and order stock when necessary

Q6.

- Just in Time production refers to a system of manufacture where components and materials are delivered to the production/assembly line just as they are needed. Possible improvement in efficiency:
- Just in Time production improves efficiency as excess stock is not kept on site reducing associated costs such as; warehouse rental, security, heating etc.
- Just in Time production improves efficiency by only producing stock to order removing the risk of stored products going out of date.
- Just in time production reduces the risk of stored goods being damaged while in storage.

- Just in time production allows manufacturers to react quickly to changes in customer demand as no excess stock is held, which may then need to be sold at a reduced price.
- Just in Time production also increases flexibility in production due to production to specific customer order