**Design & Technology**

**AQA A-Level** Logo

Description automatically generated with low confidence

**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