

1. Planning For Accuracy And Efficiency

Be able to discuss and demonstrate, the importance of planning for accuracy when making prototypes and making recommendations for small, medium and large scale production

1	One-off/Job Production	Involves producing custom work , such as A one-off product for A specific customer or A small batch of work in quantities usually less than those of mass-market products
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Skilled workforce, Specialist machines, High quality products manufactures, Expensive to buy / make, High standard of quality control, Made for a specialist client / market.

2	Batch Production	A method of manufacturing where the products are made to specified amounts, within a time frame.
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A production line is set up (one task for each stage) semi-skilled / unskilled workers (Flexible – can be redeployed to make another product), Production lines run for a limited period of time.

3	Mass Production	Also known as flow production or continuous production , is the production of large amounts of standardized products, including and especially on assembly lines.
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The emphasis in mass production is on keeping manufacturing costs low by producing uniform products using repetitive and standardized processes. As products became more complicated to produce, mass production also became more complex.

2. Quality assurance

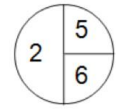
The maintenance of a desired level of **quality** in a product, by means of attention to every stage of the production process.

1	Total Quality Management (TQM)	Every member of staff must be committed to maintaining high standards of work in every aspect of a company's operations to ensure customer satisfaction. A project management system focusing on QA through the full involvement of the workforce in continual improvements.
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2	Scrum	A project management method which focuses on the organisation of workforce teams to reduce the lead times of projects.
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3	Six Sigma	A set of management techniques intended to improve business processes by greatly reducing the probability that an error or defect will occur in manufacturing.
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4	Critical Path Analysis	Critical Path Analysis is a widely used project management technique for scheduling projects. Use it to see which actions impact the overall schedule.
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Component	Description
Node	<p>A circle that represents a point in time where an activity is started or finished. The node (circle) is split into three sections:</p>  <p>The left half of the circle is the unique node (activity) number – the network diagram draws these in order The top right section shows the earliest start time (EST) that an activity can commence based on the completion of the previous activity The bottom right section shows the latest finish time (LFT) by which the previous activity must be completed</p>

Key words

1	Lead Time	The period of time between a customer order being placed and an order being fulfilled and completed. A short lead time is better than a long production lead time.
2	Tolerance	Tolerance equals the difference between lower and upper limit sizes. + / -
3	CAD	Computer Aided Design
4	NDT	Non-Destructive Testing; Acoustic Emission Testing (AE) Electromagnetic Testing (ET) Laser Testing Methods (LM) Leak Testing (LT) Magnetic Flux Leakage (MFL) Microwave Testing Liquid Penetrant Testing (PT) Thermal/Infrared Testing (IRT) Ultrasonic Testing (UT)
5	Defect	An imperfection
	QA	Attention to every stage of the process
7	QC	Testing a sample of the output against the specification
8	Gauges	To gauge is to measure or test. The noun gauge is a tool you can use to make such a measurement
9	CAM	Computer Aided Manufacture

3. Quality control

Quality control involves testing of products and determining if they are within tolerance for the final product.

1	Monitoring, Checking And Testing	Manual inspections are typically based on sampling. It can be a slow process and opens up the chance for error. An automated system can inspect the all products / parts.
2	Acceptable Tolerances	Tolerance is the allowable variation for any given size in order to achieve a proper function. Tolerance equals the difference between lower and upper limit sizes.
3	'Go-no Go' Gauges	A go/no-go gauge refers to an inspection tool used to check a workpiece against its allowed tolerances via a go/no-go test. Its name is derived from two tests: the check involves the workpiece having to pass one test (go) and fail the other (no-go)
4	Laser Measuring	Laser measures are alternatives to traditional metal rules or tape measures. They're used to calculate lengths, widths and heights from a thousand of a millimeter (micron) up to 198 meters.
5	Probe Scanning	Touch-probes gather discrete points on the surface of a component, acquiring surface data to providing a picture of the form and shape of the workpiece in a CAD format. Scanning provides a fast way to capture form and profile data from complex components.
6	Vernier Callipers	Is a measuring device used to precisely measure linear dimensions. It measures a straight line between two points.
7	Micrometers	A micrometer , is a device incorporating a calibrated screw widely used for accurate measurement of components in mechanical engineering to a very high degree of accuracy.
Methods of NDT		
8	Non-destructive Testing; X rays – Crack testing	A slow and expensive NDT method, it is a dependable way to detect cracks and voids in weld interiors. Makes use of X-rays or gamma rays .
9	Non-destructive Testing; Ultrasound	A method of measuring the thickness or internal structure of a test piece through the use of high frequency sound waves. A common example is to test the thickness of the object, for example, to monitor pipework corrosion.

Tolerances

A **tolerance** is an acceptable amount of dimensional variation that will still allow an object to function correctly.

