

Cambridge AS & A Level · Business 9609 · Notes

Quality management A2

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What you need to know

By the end of this topic you should be able to:

1. **Explain quality as meeting customer expectations:** a product is good quality when it does what its buyers expect of it at the price they pay, not only when it is expensive or luxurious.
2. **Explain why quality matters** to a business: its reputation, sales, prices, costs and legal safety.
3. **Analyse the impact of quality control methods** (inspecting and testing finished products or samples) on a business.
4. **Analyse the impact of quality assurance methods** (setting standards for, and checking, every stage of production) on a business.
5. **Analyse the impact of Total Quality Management (TQM):** making quality the responsibility of every employee in every part of the business.
6. **Explain why benchmarking is important in quality management:** comparing the business's performance with the best and using what it learns to improve.

Labour productivity, labour turnover, capacity utilisation and contribution often appear in the same Paper 3 question; how to calculate them is in the human resource management, capacity utilisation and costs topics. Lean production, kaizen as a production method and just-in-time are in operations strategy.

Understand it

What quality means

A product or service is **quality** when it meets the expectations of the customers who buy it. Those expectations depend on what they paid and what they need it for: a 3-dollar umbrella that keeps a commuter dry through a rainy season meets its buyers' expectations, and so is good quality, even though it is not a 90-dollar designer umbrella.

What customers usually expect:

- the product works and does its job (**fit for purpose**), safely and reliably, for as long as it should;
- it is the same every time they buy it (**consistent**);

- the design, finish or taste matches what was promised in the advertising;
- for a service: it starts and finishes on time, the staff are helpful, and problems are put right quickly;
- after-sales service, such as repairs and guarantees, works;
- it is **value for money**: the benefits are worth the price.

Because quality is judged by customers, a business has to find out what its customers expect before it can set its standards.

Why quality matters

Good quality:

- **builds a reputation and brand loyalty**: satisfied customers buy again and recommend the business, so sales rise without extra promotion;
- **allows a higher price**: customers pay more for a product they trust, which raises the profit margin;
- **is a competitive advantage (USP)**: in a crowded market it gives customers a reason to choose this business;
- **cuts costs**: fewer faulty products to scrap or repair (**waste** and **rework**), fewer returns, refunds and complaints to handle;
- **keeps the business within the law**: products that break safety or consumer laws can lead to fines, recalls and legal claims;
- **wins business customers**: firms that buy components or services want suppliers they can rely on, and may only sign contracts with suppliers that meet their standards.

Poor quality does the opposite. A fault found by a customer costs far more than one found in the factory: a refund or replacement, delivery both ways, staff time on the complaint, and bad reviews that put off future customers. A faulty product that is dangerous may have to be recalled from every shop.

Quality control

Quality control means **finding faults by checking the product after it has been made**. Specialist **quality control inspectors** check finished products before they leave the business, and faulty ones are reworked or thrown away. It is a **detection** approach: it catches mistakes, but does not stop them being made.

Methods:

- **Inspecting every item**, which suits expensive, made-to-order or safety-critical products (an aircraft part, a wedding cake).
- **Sampling**: checking a few items from each batch, such as 1 in every 100, and rejecting or rechecking the whole batch if too many samples are faulty. It is cheaper and quicker than checking everything, but faulty items in the unchecked part can still reach customers.
- **Testing**: running a product to see if it works (switching on a phone, pressure-testing a pipe), or testing a sample to destruction to check its strength.

- For services: managers watching staff at work, **mystery shoppers** posing as customers, and customer feedback.

Impact on the business:

- **Benefits:** fewer faulty products reach customers, so the business protects its reputation; the system is simple to understand and to run; inspectors are trained specialists, so checks are thorough and consistent.
- **Drawbacks:** faults are found only at the end, after all the materials, labour and time have been spent, so waste and rework costs are high; paying inspectors adds to costs; production workers may feel quality is "the inspector's job", so they take less care; the cause of a fault may not be found, so it keeps happening; sampling can miss faults.

Quality assurance

Quality assurance builds quality checks into the whole process instead of leaving them to the end. The business sets clear **standards for each stage** of production, from the materials coming in to the finished product going out, and the people doing each stage make sure their work meets those standards before passing it on. The aim is **prevention**: to stop faults happening at all.

Methods:

- written standards and procedures for each stage, and training so that every worker knows them;
- **self-checking**: workers check their own work, so separate inspectors are needed less, or not at all;
- checking **supplies** as they arrive, and agreeing quality standards with suppliers;
- recording where and why faults happen, so the process can be changed;
- gaining certification to a recognised quality standard from an outside body, which shows customers, especially business customers, that the business's system has been checked.

Impact on the business:

- **Benefits:** a fault is found at the stage where it happens, so less material and time are wasted and it is easier to trace and fix the cause; fewer or no final inspectors are needed, cutting wage costs; workers given responsibility for their own quality may be more motivated and take more care; consistent quality keeps customers satisfied, so repeat sales rise; certification can win contracts.
- **Drawbacks:** training costs money and takes workers off the line; output can fall at first while workers get used to checking their work; workers may resist the extra responsibility, or ask for higher pay for it; writing procedures and keeping records takes time; it only works if every stage is done properly.

Total Quality Management (TQM)

Total Quality Management goes further than quality assurance. It makes **quality part of every employee's job, in every department** (production, sales, accounts, delivery, cleaning), so that quality becomes the culture of the whole business, not a system run by one department. Quality assurance is one part of TQM.

Features of TQM:

- **Every employee is responsible** for the quality of their own work, and is trained and trusted to put problems right (**empowerment**).
- **Internal customers**: whoever receives your work next inside the business is your customer, and their needs must be met. The warehouse is the internal customer of the production line; the sales team is the internal customer of the accounts office that sends out invoices.
- **Quality chain**: the business is a chain of internal customers ending with the external customer, and one weak link lets the final customer down. Each stage refuses to accept substandard work from the stage before.
- **Zero defects** and **getting it right first time**: the target is no faults at all, not an "acceptable" number of them.
- **Continuous improvement (kaizen)**: small improvements made all the time, often suggested by employees in **quality circles**, small groups of workers who meet regularly to find and solve problems in their own area.
- **Commitment from the top**: managers lead the change and listen to employees' ideas.

Impact on the business:

- **Benefits**: fewer faults and less waste, so lower costs; no need for quality control inspectors; better quality everywhere, including service, delivery and paperwork, so customers are more satisfied and the brand is stronger; employees with responsibility and a voice may be more motivated, so productivity rises and labour turnover falls; ideas from the people who do the work keep improving the business.
- **Drawbacks**: training every employee is expensive and takes time; it needs a **change of culture**, which is hard where managers are used to making every decision or employees are used to just following instructions; some employees resist, or feel more pressure, or want more pay for more responsibility; inspectors may have to be redeployed or made redundant, with redundancy costs and worried staff; quality and output can get **worse in the short term** while people adjust; it is harder to build commitment among temporary or seasonal staff who stay only a short time; benefits come slowly, over years.

TQM is most likely to work when managers are committed and have the skills to lead change, employees are skilled and willing, the business can afford the training, and the quality problems really come from the way people work. If faults come from old machinery, poor supplies or problems outside the business, TQM alone will not solve them.

Quality control, quality assurance and TQM compared

	Quality control	Quality assurance	TQM
When are checks made?	At the end, on finished products or samples	At every stage of production	At every stage, in every department
Who is responsible?	Inspectors	The workers at each stage	Every employee, led by managers

	Quality control	Quality assurance	TQM
Aim	Detect faults before customers get them	Prevent faults happening	Zero defects and continuous improvement across the business
Main cost	Inspectors' wages, waste and rework	Training, setting up procedures	Training everyone, culture change
Main risk	Faults keep happening; waste	Workers resist or check carelessly	Culture never changes; slow results

Measuring quality

A business can measure whether it meets customer expectations in two ways.

From customers:

- **Feedback surveys** after a purchase or service, often scored out of 5 or 10.
- **Online reviews and star ratings**, which also show what other customers will read.
- **Complaints**: the number and the reasons. Each one shows exactly where something went wrong, but many unhappy customers never complain; they just do not come back.
- **Repeat customers**: the proportion who buy again. Customers who return were satisfied.
- **Returns and refunds**: the proportion of products sent back.

Feedback is most honest when it is anonymous and collected away from the staff who served the customer.

From inside the business:

$$\text{Percentage of output failing quality standards} = \frac{\text{number of units that fail}}{\text{total output}} \times 100$$

$$\text{Cost of correcting faulty output} = \text{number of faulty units} \times \text{cost of correcting one unit}$$

and the number of faulty units is often found as $\text{output} \times \text{fault rate}$. Other measures include the scrap or waste rate, the number of jobs done again, on-time delivery rate and warranty claims. Tracking these over time shows whether a new quality system is working.

Benchmarking

Benchmarking means comparing a business's products, processes or performance with those of the **best performers**, usually rival businesses in the same industry or the best in any industry at a particular task, and then setting targets and changing methods to match or beat them.

The steps:

1. Choose what to compare (fault rate, delivery time, waiting time, complaints per 1,000 customers).
2. Find the businesses that do it best, and collect their figures and, where possible, find out how they do it.
3. Compare, and work out the size of the gap.

4. Set targets and change the business's own methods to close the gap.
5. Check the results and repeat, because the best performers keep improving too.

A business can also benchmark **internally**, comparing its own branches or factories and spreading the methods of the best one.

Why benchmarking matters in quality management:

- it shows **where** the business is falling behind and **by how much**, so it knows which quality problems to tackle first;
- targets based on what another business already achieves are **realistic**, so employees accept them;
- the business **learns proven methods** instead of inventing them;
- it keeps quality improving all the time, which supports TQM's aim of continuous improvement;
- it shows whether the business's quality meets what customers will compare it with.

Limitations: rivals may not share their data or methods, so the information can be incomplete; collecting it costs time and money; a method that works for one business may not suit another with a different size, workforce or customers; copying others can stop a business finding new ideas of its own; and matching the best is not the same as meeting this business's own customers' expectations.

Key facts and formulas

There is no formula list for this subject in the exam. "Learn it" means you must remember it.

Fact or formula	Status
Quality: how well a product meets the expectations of the customers who buy it, at the price they pay	Learn it
Quality control: finding faults by inspecting or testing finished products or samples (detection)	Learn it
Quality assurance: standards set for every stage of production, with checks at each stage (prevention)	Learn it
TQM: every employee in every department responsible for quality; internal customers, zero defects, continuous improvement	Learn it
Internal customer: the person or department inside the business that receives your work next	Learn it
Benchmarking: comparing performance with the best performers, then setting targets and changing methods to match them	Learn it
Percentage of output failing quality standards = $\frac{\text{units that fail}}{\text{total output}} \times 100$	Learn it
Cost of correcting faulty output = output $\times$ fault rate $\times$ cost of correcting one unit	Learn it

How to do it

We have tagged 11 questions on this topic (2021–2025), all on Paper 3. 2 of them have parts of more than one type, so the counts add up to 13.

Question type	Questions
Evaluate whether TQM is the best or a sufficient way to solve a business's problems	5
Calculate quality figures from case data	3
Analyse two benefits of quality assurance	2
Evaluate whether introducing quality assurance will benefit the business	1
Analyse two problems of introducing TQM	1
Analyse two ways to measure whether customers' expectations are met	1

The marks are for four skills: **K** (knowledge: a correct point or definition), **App** (application: using the business in the question), **An** (analysis: a chain of causes and consequences) and **Eval** (evaluation: a supported judgement). Below, (K), (App), (An) and (Eval) after a sentence show the mark it earns.

1. Evaluate whether TQM is the best or a sufficient way to solve a business's problems (5 questions)

The case describes a business with a quality problem (faulty output, rejects, complaints, high waste) and asks you to judge TQM: whether it is the best way to fix the problem, whether it is enough, how far it will cut costs, or whether the business should introduce it. Since 2024 it is worth **[12]**: 2 K, 2 App, 2 An, 6 Eval. In 2021 it was worth 12 (2 K, 2 App, 4 An, 4 Eval) or, as a "Discuss" question, 16 (2 K, 2 App, 6 An, 6 Eval).

- K**: define TQM accurately (every employee responsible for the quality of their own work) and use its features: internal customers, the quality chain, zero defects, right first time, continuous improvement, quality circles, empowerment, culture change. One mark scheme limits an answer to the bottom level in every skill if it shows knowledge of quality or quality control but not of TQM, so the definition matters.
- App**: use the case: what the business makes, how it checks quality now (inspectors at the end, or no system at all), its figures (fault rate, cost of rework, complaints, labour turnover), its workforce (skilled or unskilled, permanent or temporary), how its managers lead, and its finances. Two different uses of the case give both App marks.
- An**: chains on **both** sides.
 - For: each stage refuses faulty work from the one before → faults are stopped where they start → less scrap and rework → lower unit cost → higher profit.
 - For: employees given responsibility and a say → more motivated → more care, higher productivity, lower labour turnover → lower recruitment and training costs.
 - For: inspectors no longer needed → lower wage costs.
 - Against: every employee needs training → a large cost now, and a cash outflow the business may struggle with if its liquidity is weak.

- Against: a culture of managers deciding everything → employees not used to responsibility → resistance → TQM takes years to work, and quality can dip at first.
- Against: the cause of the problem lies elsewhere (old machines, unreliable supplies, power cuts, low pay) → TQM does not touch it → the problem continues.

4. **Eval:** decide **for this business**, and say what the answer depends on. Useful judgements:

- Which causes of the problem TQM fixes, and which need something else. The wording "the **best** way" or "**sufficient**" needs a comparison with other approaches (new equipment, new suppliers, better pay, permanent contracts, targets for fault rates, quality assurance alone).
- Short term against long term: costs and a possible dip now, savings and a better reputation later.
- Whether the managers have the skills and commitment to lead a culture change, whether the workforce is willing and stable enough, and whether the business can afford the training.
- A staged approach (start in one department, or with quality circles) can be a justified recommendation.

One mark scheme warns that the question is **not** asking why fewer quality problems would be good; it asks whether TQM is the way to get there.

2. Calculate quality figures from case data (3 questions)

Short parts worth [2] or [3], before an evaluation part. Write the formula first: it earns 1 mark if the rest goes wrong.

1. **Percentage of output failing quality standards** = $\frac{\text{units that fail}}{\text{total output}} \times 100$. Read the table carefully: if it gives several months, add them up first.
2. **Cost of correcting faulty output:** find the number of faulty units (output × fault rate), then multiply by the cost of correcting one. The marks are cumulative: one for the number of faulty units, one for multiplying by the unit cost, one for the answer.
3. **"Assume TQM (or quality assurance) is introduced successfully":** the case says what will change, such as output rising by a percentage or the variable cost per unit falling. Apply the change, then use the formula the question asks for. One question asked for the new capacity utilisation ($\frac{\text{output}}{\text{maximum output}} \times 100$) and the change in contribution per unit (price minus variable cost per unit).

Give a percentage to 1 or 2 decimal places unless told otherwise, and units where they help. Your answers become application in the evaluation part: if your figure is wrong, using it consistently still earns credit.

3. Analyse two benefits of quality assurance (2 questions)

[8]: 2 K, 2 App, 4 An, for **two** benefits. Only benefits are rewarded, and only the best two count.

1. **K** (2 in all): a definition of quality assurance earns one at most; each relevant benefit named can earn one. Benefits: less waste and rework, faults found early and easier to trace, no or fewer inspectors, employees responsible for their own quality and more motivated, consistent quality and more satisfied customers, lower costs, greater competitiveness.

2. **App** (1 for each benefit): tie each benefit to the case: what the business makes and from what, who its customers are, how its employees are paid and trained, what it is known for, any safety issue with its product.
3. **An** (up to 4): a chain of **two or more links** from each benefit to costs, sales or profit. A developed chain on both benefits earns 4; a developed chain on one earns 3.
 - checks at each stage → a fault is found where it starts → fewer finished products scrapped → less waste of materials → lower unit costs → higher profit;
 - quality checked by the workers → inspectors not needed → lower wage costs → lower prices or higher margin;
 - responsibility for quality → more motivated workers → more effort and productivity → more output from the same workforce;
 - consistent quality → satisfied customers → repeat orders and recommendations → higher sales.

Do not evaluate: there are no marks for it here, and it takes time from your chains.

4. Evaluate whether introducing quality assurance will benefit the business (1 question)

[12]: 2 K, 2 App, 2 An, 6 Eval. The same plan as type 1, with quality assurance in place of TQM.

1. **K**: define quality assurance and contrast it with quality control. Developed knowledge shows how quality assurance would affect this business.
2. **App**: the case's figures (a rising failure rate, falling productivity, a past product failure), its market (business customers, leased or safety-critical products, a competitive industry) and its workforce.
3. **An**: benefits (less waste, faults traced to their stage, no final inspection, motivated workers, satisfied customers) against drawbacks (training cost, an early fall in output, wage demands, more pressure, resistance to change).
4. **Eval**: weigh short-term costs against long-term gains in reputation and costs. Say what it depends on: how much its customers value quality compared with price, how costly a fault is for this business (a safety failure, a lost contract), the skills and willingness of the workforce, and whether it fits with what the other departments are doing.

5. Analyse two problems of introducing TQM (1 question)

[8]: 2 K, 2 App, 4 An, for **two** problems; only problems are rewarded, and the best two count. One fully developed problem can reach 3 analysis marks.

1. **K**: define TQM (1 mark at most), and name problems: training cost, resistance from employees, a short-term fall in productivity or quality, managers lacking the skills to delegate and lead, the culture change needed, redundancy of inspectors, the time it takes, a product that is hard to check at each stage.
2. **App**: the case: the kind of contracts its staff are on (temporary and seasonal staff need training again every season and may feel little commitment), how it checks quality now, how busy the factory is, how skilled the staff are.

3. **An:** chain each problem to costs, output, sales or profit: "seasonal staff leave after a few months → every new group must be trained in TQM → training costs are paid again each year → higher costs and lower profit".

6. Analyse two ways to measure whether customers' expectations are met (1 question)

[8]: 2 K, 2 App, 4 An, for **two** ways; the best two count.

1. **K:** what meeting customers' expectations means (customers get what they expected for the price) and ways to measure it: feedback surveys, online reviews and ratings, complaints, repeat customers, returns, a change in bookings or sales.
2. **App:** fit each way to the business: when and how its customers could be asked, whether it already collects reviews, whether customers come back often.
3. **An:** explain why the measure is reliable (or what it misses) and how the results lead to improvements and future sales: "an anonymous online survey sent the day after → customers give honest answers away from the staff → the business sees which part of the service disappoints → it retrains staff in that area → more satisfied customers → more repeat bookings and revenue".

Write one paragraph for each way.

Worked examples

Example 1

Orbit Appliances (OA) makes electric kettles. Every finished kettle is tested by an inspector. In March, OA produced 24,000 kettles; 1,080 failed the test and were repaired, at an average cost of 9 dollars each.

(a) Calculate the percentage of OA's output that failed the test in March. [2]

(b) OA expects quality assurance to cut the failure rate to 2% of output. Assuming output stays at 24,000 kettles a month, calculate the monthly saving in repair costs. [3]

(a) Percentage failing = $\frac{1080}{24000} \times 100$ (1) = 4.5% (2).

(b) Faulty kettles at 2%: $24000 \times 0.02 = 480$ (1). Repair costs: now $1080 \times 9 = 9720$ dollars; with quality assurance $480 \times 9 = 4320$ dollars (2). Monthly saving = $9720 - 4320 = 5400$ dollars (3).

The saving is before the cost of training OA's workers in quality assurance, so in an evaluation you would compare it with that cost: 5,400 dollars a month is 64,800 dollars a year.

Example 2

Lumen Print (LP) prints books for publishers. Each job goes through four stages: checking the publisher's files, printing, folding and binding. At present one inspector checks a sample of finished books at the end of each job. Last year 6 of LP's 150 jobs had to be reprinted in full because pages were found in the wrong order, and two publishers moved their work to other printers after the reprints made their books arrive late. The price of LP's paper has risen by 15% this year.

Analyse two benefits to LP of using quality assurance. [8]

Benefit 1: less waste. Quality assurance sets a standard for each stage and checks work as it is done, so faults are prevented rather than found at the end (K). An operator who checks the page order as the first sheets come off the folding machine finds a mistake after a few sheets, instead of after the whole job has been printed and bound (App). LP would no longer need to reprint whole jobs, like the 6 last year (An), so much less paper would be wasted just as paper has become 15% dearer, which cuts the cost of each job and protects LP's profit margin (An).

Benefit 2: reliable delivery, so publishers stay. Fewer faults mean jobs leave LP on schedule (K). Publishers need their books by a launch date, and LP has already lost two publishers whose books were late because of reprints (App). With fewer reprints holding up the presses, LP's jobs finish on time (An), so publishers keep sending their work and recommend LP to others, raising its revenue (An).

$2 K + 2 App + 4 An$ (a chain of two links on each benefit) = 8. A definition alone would earn one K mark; both K marks need the benefits as well. No judgement is needed, so none is given.

Example 3

Kestrel Parcels (KP) delivers parcels for online shops from one depot, handling 40,000 parcels a day. In 2025, 2.4% of its parcels led to a complaint, against an industry average of 0.9%. A manager found that about half of the complaints come from parcels loaded into the wrong van, a quarter from parcels damaged when loaded, and a quarter from parcels whose tracking is lost because the seven-year-old handheld scanners keep failing. Sorting staff are set targets for speed only. Most of KP's employees are permanent and labour turnover is low, but managers make every decision and staff are never asked for ideas. New scanners would cost 250,000 dollars. KP's two largest customers, worth 35% of its revenue, have said they will leave if complaints have not fallen within 12 months.

Evaluate whether total quality management (TQM) is the best way for KP to reduce its customer complaints. [12]

Knowledge. TQM makes every employee responsible for the quality of their own work (K). Each stage treats the next one as its internal customer and does not pass on faulty work, aiming for zero defects (K).

The size of the problem. KP has $40000 \times 0.024 = 960$ parcels a day leading to complaints; at the industry average it would have $40000 \times 0.009 = 360$, so it is 600 a day worse (App). Half of the 960, about 480 a day, are loading errors; 240 are damage and 240 are lost tracking (App).

For TQM. If loaders become the sorters' internal customers, a sorter is judged on accuracy, not just speed, and a loader refuses a parcel meant for another van, so wrong-van errors fall (An). Asking staff for ideas through quality circles gives employees a voice for the first time, which can motivate them to take more care in handling, cutting the damage complaints (An). Together these causes are about 720 of the 960 complaints a day.

Against TQM. It does nothing for the 240 complaints a day caused by failing scanners: that is an equipment problem, and only new scanners fix it (An). TQM also needs a change of culture: KP's managers make every decision, so they must learn to hand over responsibility, which takes time and training, and complaints may not fall quickly enough to keep customers worth 35% of revenue (An).

Judgement. TQM is the best way to tackle KP's two staff-caused problems, wrong vans and damage, about three-quarters of its complaints, because both come from how staff work, and a stable, permanent workforce is a good base for the training (Eval). But it is not enough on its own: KP should also buy the scanners for 250,000 dollars, which removes the lost-tracking quarter quickly, and change sorters' targets from speed alone to speed and accuracy straight away, since TQM's full effect takes longer than the 12 months its largest customers have given it (Eval). Whether TQM works depends most on KP's managers: if they will not share decisions with staff, quality circles will produce no real change, so KP should start with the loading area and widen TQM once it has cut those errors (Eval).

The marks: 2 K, 2 App, 2 An, and 6 Eval for a judgement in KP's context that weighs TQM against other approaches and says what its success depends on.

Common mistakes

- **Confusing quality assurance with quality control.** Describing inspectors checking finished products as quality assurance gets the whole answer wrong (June 2023). Quality control is checking at the end; quality assurance is checking at every stage by the people doing the work.
- **Saying TQM needs more inspectors.** Even candidates who knew TQM spreads quality across the business sometimes claimed the business would need to hire extra inspectors (June 2021). Under TQM every employee checks their own work, so inspectors are needed less or not at all.
- **Not knowing what TQM is.** Writing only about quality in general, or about quality control, earns little (June 2021, November 2021); one mark scheme limits such answers to the lowest level in every skill. Learn a precise definition and its features.
- **Stopping halfway through a cost calculation.** Many candidates worked out how many units were faulty and then did not multiply by the cost of correcting each one (November 2021). Read what the question asks for and finish it.
- **Analysing more than two benefits, or adding evaluation to an "Analyse two" question.** Only the best two are marked, and judgements earn nothing there; both take time away from developing the two chains (June 2023).
- **Writing about "materials" in general instead of applying.** Name the business's actual material when you say quality assurance cuts waste, or link the benefit to what the business is known for, such as its reputation for quality (June 2023).

- **Forgetting the other side: what TQM cannot fix.** Many candidates rightly pointed out that TQM would not solve problems with suppliers or with power and water supplies, which need other action; this gives the counter-argument an evaluation needs (November 2021).
- **Answering "why reducing quality problems is good" when asked whether TQM is the best way.** The question is about whether TQM will work better than other approaches.

How to get the marks

- **Command words.** *Calculate*: formula, working, answer. *Analyse*: two points (when asked for two), each developed through a chain of two or more links to a consequence for costs, sales or profit; no judgement. *Evaluate* and *Discuss*: both sides, then a decision for this business with reasons and what it depends on.
- **[2]–[3] calculations**: write the formula, show the substitution, give the answer. Each step usually earns a mark, and the formula alone earns 1 if the rest fails.
- **[8] analyse two**: 2 K (a definition earns at most one), 2 App (one for each point), 4 An (a developed chain on each point). One paragraph per point.
- **[12] evaluate**: 2 K, 2 App, 2 An, 6 Eval. The top band needs a judgement **in context**: a decision for this business, supported by its figures and facts, that weighs both sides and says what the result depends on. A conclusion that would fit any business is capped below the top band.
- **Define precisely.** Quality control = checking at the end, detection; quality assurance = standards and checks at every stage, prevention; TQM = everyone responsible for quality, a whole-business culture. These are the K marks and the base for everything else.
- **Use the numbers.** A failure rate, the cost of rework or a gap with the industry average is strong application; use your own answers from the calculation parts.
- **Think about "depends on".** Managers' skills and commitment, the workforce's willingness and stability, the cost of training against the cost of faults, short term against long term, and whether the problem has other causes are the judgements examiners reward.

Quick check

1. State two differences between quality control and quality assurance.
2. A sock factory made 250,000 pairs of socks in three months. 6,000 pairs did not meet its standards and were sold as "seconds", at 1.50 dollars less than a perfect pair. Calculate the percentage of output that failed the standards and the revenue lost by selling the seconds at the lower price.
3. Say whether each is an example of quality control, quality assurance, TQM or benchmarking: (a) at the end of the line, a supervisor tests 1 in every 50 batteries; (b) each worker on a sandwich line checks the filling against a standard photo before passing the tray on; (c) the maintenance team asks the production workers whose machines it repairs to score each repair, and changes how it works to raise the scores; (d) a hotel compares its check-in times with those of the fastest hotel chain in the country.
4. A chain of car-repair garages finds that a rival repairs the same faults in 30% less time. Explain one benefit and one limitation for the chain of benchmarking itself against this rival.

5. A cinema wants to know whether it meets its customers' expectations. Analyse one way it could measure this.

Answers

1. Any two: quality control checks finished products at the end, quality assurance checks at every stage; quality control is done by inspectors, quality assurance mainly by the workers themselves; quality control detects faults, quality assurance aims to prevent them.
2. Percentage failing = $\frac{6000}{250000} \times 100 = 2.4\%$. Revenue lost = $6000 \times 1.50 = 9000$ dollars.
3. (a) Quality control (sampling). (b) Quality assurance (a standard and a check at that stage, by the worker). (c) TQM (production workers are maintenance's internal customers, and it keeps improving). (d) Benchmarking.
4. Benefit: the chain learns exactly how far behind it is and can find out which methods (tools, layout, training) make the rival faster, so it sets realistic targets and repairs more cars a day with the same mechanics, raising revenue. Limitation: the rival is unlikely to explain its methods, so the chain may know the gap but not how to close it; or speed may come at the cost of quality, so copying it could mean more cars coming back.
5. For example: an online rating sent by email the morning after the film, with a score for seats, sound, food and staff (K). Customers answer at home, away from staff, so the scores are more honest (An); the cinema sees which part scores lowest, such as long queues for food, and adds staff at busy times (An), so more customers enjoy the visit and come back, raising ticket sales (An).

Past questions to try

- **9609/31/O/N/24 Q5**: how far TQM would cut a manufacturer's costs.
- **9609/32/O/N/21 Q4**: the monthly cost of correcting faulty output, then whether TQM is enough.
- **9609/33/M/J/23 Q2**: two ways a service business can measure whether it meets customers' expectations.
- **9609/31/M/J/23 Q1**: two benefits of quality assurance to a manufacturer.