

Cambridge AS & A Level · Business 9609 · Notes

Inventory management AS

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What you need to know

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

1. **Explain why businesses hold inventory**, and tell apart the three kinds: **raw materials**, **work in progress** and **finished products**.
2. **Explain the costs and the benefits of holding inventory**, and so why one business keeps a lot while another keeps very little.
3. **Define and use buffer inventory, re-order level and lead time**, and show how they fit together.
4. **Read a simple inventory control chart**: pick out the maximum level, the re-order level, the buffer, the lead time and the order quantity, work out how much was used or sold, and say what an unusual shape on the chart means.
5. **Explain why supply chain management matters** to a business, and judge how important it is compared with other things a business must get right.
6. **Explain the purpose of Just in Time (JIT) and Just in Case (JIC)**, the two opposite ways of managing inventory.
7. **Analyse and judge the impact on a business of adopting JIT**: what it gains, what it risks and when it suits.

Working out inventory turnover and the value of inventory belongs to finance and accounting; lean production as a whole, of which JIT is one part, is in operations strategy at A Level.

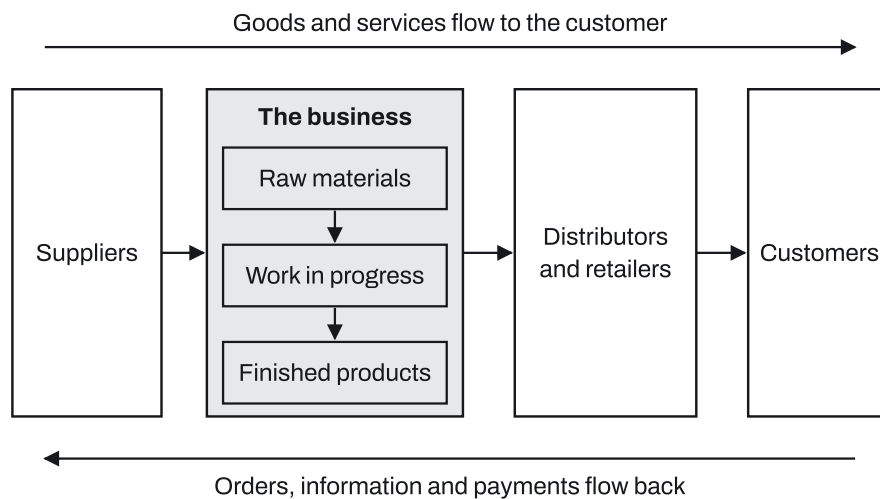
Understand it

What inventory is and why businesses hold it

Inventory (also called stock) is the goods a business has on hand: materials waiting to be used, products part-way through being made, and products waiting to be sold. It is the goods themselves, not the room or warehouse where they sit.

Inventory lets production and selling carry on smoothly even though deliveries arrive in batches while use is continuous: a factory cannot stop each time one component runs out, and a shop cannot sell what is not on its shelves. The management question is "**how much, of what, and for how long?**"

The three kinds of inventory



Kind	What it is	Example: a chocolate maker
Raw materials (and components)	Inputs bought from suppliers that have not yet been worked on	Sacks of cocoa beans and sugar, rolls of wrapping foil
Work in progress	Partly made products, somewhere inside the production process	Liquid chocolate being mixed and cooled, unwrapped bars
Finished products	Completed goods waiting to be sold or sent to customers	Wrapped, boxed bars ready to send to supermarkets

Raw materials protect production against late deliveries; work in progress builds up because some stages are slower than others; finished products let orders be met straight away. Service businesses hold inventory too: a cinema keeps popcorn kernels and paper cups.

The costs of holding inventory

Holding inventory is never free. The main costs:

- **Opportunity cost and working capital.** Money spent on goods that sit on shelves is cash that is not available for anything else: paying suppliers and wages, marketing, or new equipment. The more inventory, the more **working capital** is tied up and the weaker the business's **liquidity**. If the business borrows to fund it, it also pays interest.
- **Storage costs.** Rent of the warehouse or store, heating, cooling or lighting, shelving and the wages of the staff who receive, move and count the goods. The space itself has an opportunity cost: it could hold more production or more selling space.
- **Insurance and security.** Valuable inventory must be insured and protected against theft.
- **Waste, damage and deterioration.** Food and medicines pass their use-by dates; goods get broken when moved.
- **Obsolescence.** Goods go out of fashion or are overtaken by a newer model, and must be sold off cheaply or thrown away. Electronics and clothing are most at risk.

Each cost ends in the same places: **higher costs** → **lower profit**, or **less cash** → **difficulty paying bills**. For a public limited company lower profit can also mean lower dividends and a falling share price.

These costs are also the **reasons a business might choose to hold low levels of inventory**: to cut storage, insurance and waste; to keep cash free for other uses; because it uses JIT; because its storage space is small or must be specially controlled; because it is new and simply cannot afford much stock; or because it makes products to order, so there is little point keeping finished goods.

The benefits of holding inventory

- **No stockouts.** A **stockout** happens when the business runs out of something. With enough inventory, production keeps going and customers are served.
- **Meeting sudden or large demand.** An unexpected large order, a heatwave, a competitor's product failure: the business can take the extra sales instead of turning customers away to rivals.
- **Seasonal demand.** Making a seasonal product steadily all year and storing it means the business does not need the capacity to make everything in the busy weeks.
- **Protection against supply problems.** If a delivery is late, a supplier has a strike or a ship is delayed, production carries on using the stock already held.
- **Covering forecast errors and damaged goods.** If sales were forecast too low, or some stock is spoiled, there is still enough.
- **Bulk-buying discounts.** Buying in large quantities often lowers the price per unit, and fewer orders mean less ordering and delivery work.

The chain for the most common benefit: enough inventory → orders met straight away → no lost sales and satisfied customers → customers stay loyal instead of trying a rival → revenue protected.

Buffer inventory, re-order level and lead time

- **Buffer inventory** (safety stock) is the lowest level of stock the business plans to keep at all times. It is a cushion: in normal weeks it is never used, but it covers a late delivery or a sudden rise in demand.
- **Lead time** is how long it takes from the moment the business **places an order** with its supplier until the goods **arrive** and can be used.
- **Re-order level** is the quantity of stock on hand at which the business sends off its next order. It is a **quantity**, not a time or a process.

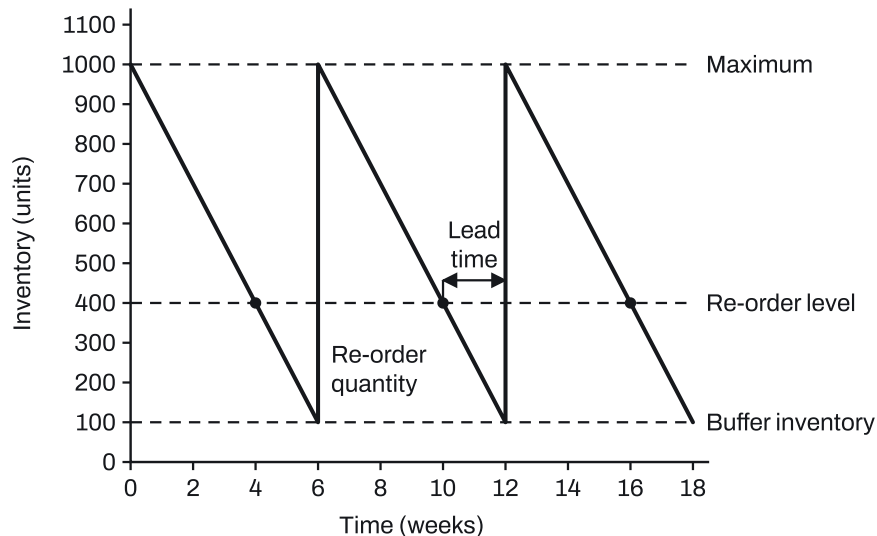
The order must go out early enough for the delivery to arrive just as stock reaches the buffer, and stock keeps being used while the business waits. So:

$$\text{Re-order level} = \text{buffer inventory} + (\text{usage per period} \times \text{lead time})$$

For example, a business that uses 150 units a week, has a lead time of 2 weeks and keeps a buffer of 100 units should re-order when inventory falls to $100 + 150 \times 2 = 400$ units. The **re-order quantity** (order size) is how much it orders each time; if each order is 900 units, inventory goes back up to $100 + 900 = 1000$ units, its **maximum** level, when the delivery arrives on time.

Reading an inventory control chart

An **inventory control chart** shows the stock level over time. With steady use it has a saw-tooth shape: stock falls as it is used, then jumps up when a delivery arrives.



What to read from it:

- **Maximum inventory:** the top of each jump (1,000 units here).
- **Re-order level:** the horizontal line at which orders are placed (400 units).
- **Buffer inventory:** the lowest planned level (100 units). In a normal cycle stock reaches it just as the delivery comes.
- **Lead time:** the horizontal distance between the order being placed and the delivery arriving (2 weeks).
- **Re-order quantity:** the height of each vertical jump (from 100 up to 1,000 is 900 units).
- **Rate of use:** the slope of the falling line. Here stock falls 600 units in 4 weeks, so 150 units a week.

Working out how much was sold or used. Over any period, each falling stretch is stock used. So:

Units used = sum of the levels at the top of each fall – sum of the levels at the bottom of each fall

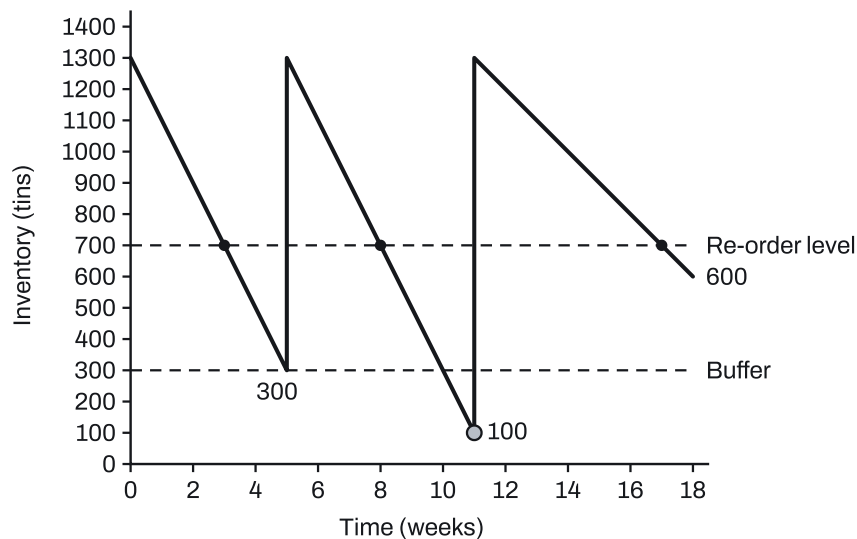
Count the final stretch too, ending at the closing level. A second way gives the same answer: units used = opening inventory + all deliveries – closing inventory. For the chart above, weeks 0 to 18: the falls go from 1,000 to 100 three times, so $3 \times 1000 - 3 \times 100 = 2700$ units, which is 150×18 .

When the chart is not neat. Real charts tell a story:

- **Stock falls below the buffer:** either demand was higher than expected (the line gets steeper after the order is placed) or the delivery came late (the line keeps falling past the planned delivery week). Both mean the buffer did its job.
- **Stock reaches zero:** a stockout. Production stops or customers go without; sales are lost.
- **Stock never gets near the buffer:** demand was lower than planned, so the business is holding (and paying for) more than it needs. It might lower its re-order level or order less each time.

- **A jump smaller or larger than usual:** the order quantity changed.

The chart below, for one colour of paint at a wholesaler, shows a late delivery and a fall in demand; Worked example 2 reads it.



Just in Case (JIC)

Just in Case is a way of managing inventory in which the business deliberately keeps **more stock than it expects to need**, so it can carry on if demand suddenly rises or a supply problem hits. Its **purpose** is security: never running out, never stopping production, never sending a customer away. Its weakness is all the costs of holding inventory listed above.

Just in Time (JIT)

Just in Time is the opposite: inventory is ordered so that it **arrives exactly when it is needed** in production (or just as the finished product is due to be sent out), so that little or **no stock has to be stored**.

The **purpose** of JIT is to cut the cost and waste of holding inventory and make the business more efficient. It is one part of **lean production**.

What JIT needs to work:

- **Reliable suppliers**, usually close by, willing to make frequent small deliveries at short notice.
- **Accurate forecasting and careful planning**, so that the right quantities are ordered at the right moments.
- **High quality** at every stage: with no spare stock, one faulty batch stops production.

Advantages of JIT:

- **Lower storage costs:** less warehouse space, rent, insurance, security and staff.
- **Less working capital tied up:** cash that would sit in stock can be used elsewhere, so liquidity improves.
- **Less waste and obsolescence:** nothing sits long enough to spoil or go out of date.

- **Space freed** for production or selling.
- **No overproduction:** products are made to match orders, so there is no pile of unsold finished goods.

Disadvantages of JIT:

- **Exposure to supply problems:** if a delivery is late or faulty there is nothing to fall back on, so production stops, workers and machines stand idle and customer orders are late.
- **Dependence on suppliers:** the business needs suppliers it can trust; a new or distant supplier is a risk.
- **Higher ordering and delivery costs:** many small deliveries mean more transport and more paperwork.
- **No bulk-buying discounts:** small orders lose the lower prices of large ones, which raises unit costs.
- **Difficulty meeting sudden demand:** with no finished goods in reserve, an unexpected rise in orders cannot be met at once, so sales may be lost.
- **Set-up cost:** new ordering systems, new suppliers and staff training cost money and time.

Which approach suits which business

No approach is best for every business, and many use a mixture: JIT for bulky or perishable items, and a buffer of anything that is cheap to store or hard to get. The choice depends on:

- **The suppliers:** how close, how reliable, how long they have worked with the business.
- **The product:** perishable, fashion or fast-changing technology products favour low stock; durable, cheap, standard items can safely be stored.
- **Demand:** steady and predictable demand suits JIT; seasonal, uncertain or sudden demand suits a buffer.
- **What customers expect:** if customers want a product or service immediately, the business needs stock on hand; if they are happy to wait for a made-to-order product, it does not.
- **Storage space and its cost,** and how much cash the business has.
- **The business's objectives:** cutting costs and raising efficiency point towards JIT; reliability and customer service may point towards keeping a buffer.
- **External risks:** transport disruption, extreme weather or a pandemic can break supply chains.

Supply chain management

A **supply chain** is every stage a product passes through, from the suppliers of materials, through the business, to distributors and the final customer (the first diagram on this page). **Supply chain management (SCM)** means coordinating that whole flow of goods, services and information, so that customers get what they ordered, when they were promised it, without the business wasting money along the way. It covers three parts:

- **Inbound:** choosing suppliers, agreeing prices and quality, ordering and receiving materials.
- **Inside the business:** moving materials through production, controlling inventory at each stage, storing finished goods.
- **Outbound:** packing, transport, warehousing and delivery to customers, and handling returns.

Inventory management is one part of SCM: how much stock to hold, where and when depends on how well the rest of the chain works. A business with a fast, dependable supply chain can hold far less inventory.

Why SCM matters:

- **Reliability and reputation:** a break anywhere in the chain means the customer's order is late, and customers who are let down go elsewhere.
- **Speed:** when every stage is planned to hand on smoothly to the next, products reach buyers sooner than rivals' do, and buyers who are served quickly come back.
- **Cost:** fuller lorries, fewer wasted journeys and smaller stockpiles all save money, and a business that buys a large share of a supplier's output can win better terms.
- **Quality:** checking suppliers' standards and handling goods carefully reduces faults and returns.
- **Ethics:** customers judge a business by how its suppliers treat workers and the environment.

Limits. SCM costs money: software, specialist staff, monitoring suppliers. It matters most where the chain is long and complex and where speed of delivery is part of what the customer buys. For a service business the chain may carry information or content rather than materials, but it still runs from inputs to the customer. And the product, the people, marketing and technology all affect success too.

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
Three kinds of inventory: raw materials (and components), work in progress, finished products	Learn it
Buffer inventory: the minimum stock level kept at all times as a safety margin against late deliveries or unexpected demand	Learn it
Lead time: the time from placing an order with a supplier to receiving the goods	Learn it
Re-order level: the quantity of stock at which a new order is placed	Learn it
Re-order level = buffer inventory + (usage per period × lead time)	Learn it
Maximum inventory = buffer inventory + re-order quantity (when deliveries arrive on time)	Learn it
Units used or sold from a chart = sum of the tops of each fall – sum of the bottoms of each fall	Learn it
Units used or sold = opening inventory + deliveries – closing inventory	Learn it

Fact or formula	Status
JIT: inventory arrives just when it is needed, so little or none is stored	Learn it
JIC: extra inventory is kept deliberately, in case demand rises or supplies fail	Learn it
Supply chain management: coordinating the flow of goods, services and information from suppliers, through the business, to the customer	Learn it

How to do it

We have tagged 23 questions on this topic (2021–2026), on Papers 1 and 2. 7 of them have parts of more than one type, so the counts add up to 30.

Question type	Questions
Define an inventory term	6
Explain or analyse the costs of holding inventory or reasons for low inventory	5
Explain or analyse the advantages, disadvantages or impacts of JIT	5
Explain or analyse the benefits of holding inventory	4
Evaluate the importance of supply chain management	4
Evaluate an inventory approach for a business	3
Explain the term supply chain management	2
Calculate from an inventory control chart	1

The marks are for four skills: **K** (knowledge: a correct point or definition), **App** (application: using the business or industry 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. Define an inventory term (6 questions)

Paper 1 "Define the term ..." [2], or the same on Paper 2 Question (a)(i). Two marks for a full definition; one for a part of it. Every term has two elements, and you need both:

Term	Element 1	Element 2
Buffer inventory	it is stock (inventory)	the minimum level kept as a safety cushion, to cover delays or extra demand
Lead time	the time from placing the order	until the goods are received
Re-order level	a quantity of stock	at which a new order is placed with the supplier

Term	Element 1	Element 2
JIT	a way of managing inventory so that supplies arrive just when needed	so little or no stock is stored
JIC	a way of managing inventory that keeps extra stock	in case of unexpected demand or supply problems

1. Write one clear sentence that contains both elements.
2. Don't give an example instead of a definition, and don't define a word using itself. A JIT definition that says only "low inventory" is partial; a lead time with no starting point is partial.

2. Explain or analyse the costs of holding inventory or reasons for low inventory (5 questions)

Forms: "Explain one cost for [case business] of holding inventory" [3]; "Analyse one reason why a business might hold low levels of inventory" [5]; "Analyse two costs (or disadvantages) to [case business] of holding inventory / a high level of inventory" [8].

1. **K**: name the cost precisely: opportunity cost, working capital tied up, storage, insurance and security, waste and damage, obsolescence, interest on borrowing. A reason for low stock is often the same cost seen from the other side ("to avoid storage costs"), or JIT, limited space, a new business's limited cash, or making to order.
2. **App**: use the case: what the business stores and where, how much stock it has and what it is worth, any figures in the case, what has happened to its sales or cash.
3. **An**: carry the cost through to its consequence. Useful chains:
 - rent, insurance and storeroom wages → higher fixed costs → lower profit → less to reinvest (or, in a plc, smaller dividends and a weaker share price);
 - cash locked in stock → less working capital → bills or wages paid late, or an overdraft with interest;
 - goods kept too long → out of date or out of fashion → sold cheaply or scrapped → the money spent on them is lost.

Mark structures: [3] = 1 K + 2 App (an explanation and the case); [5] = 1 K + 2 App + 2 An, all on **one** reason (a second reason earns nothing); [8] = for each of two points, 1 K + 1 App + 2 An. A two-sided point ("this cost is high, but it is lower than the profit lost from a stockout") also counts as developed analysis.

Variations you will meet: a case where sales have fallen and stock has piled up: build the chains from the case's own consequences, such as weaker cash flow or a falling share price.

3. Explain or analyse the advantages, disadvantages or impacts of JIT (5 questions)

Forms: "Explain one disadvantage of JIT" [3]; "Analyse two benefits / disadvantages / possible impacts on [case business] of adopting JIT" [8].

1. **K**: name the advantage or disadvantage (the lists in "Understand it").

2. **App**: what does the business store now, and in what conditions? Who are its suppliers and how reliable are they? Does it make to order or for stock? What do its customers expect (speed, variety)?
3. **An**: the chain to the end result. For example: no spare components → one late delivery stops the line → workers paid while idle and customer orders missed → lost revenue and reputation. Or: less cash held in stock → more working capital → suppliers paid promptly and money available for new equipment.

"Impacts" means you may choose good or bad ones, or one of each. An answer that weighs both sides of one impact ("storage costs fall, but delivery costs rise") counts as developed analysis.

Variations you will meet: a business that already uses JIT (analyse the benefits it gets) or one thinking of switching (analyse what changes for it). On [3] Paper 1 questions, one point explained in two steps is enough: "Supplies must arrive exactly on time (K); if a lorry is delayed there are no spare parts, so production stops (App) and orders are delivered late (App)."

4. Explain or analyse the benefits of holding inventory (4 questions)

Forms: "Explain one (or two) advantages of holding buffer inventory" [3]; "Explain one purpose of JIC" [3]; "Analyse two benefits to a business of holding high levels of inventory" [8].

1. **K**: the benefit: no stockouts, production continues if supplies are late, sudden or seasonal demand met, large orders accepted, forecast errors covered, bulk discounts, fewer orders to process.
2. **App**: on Paper 1 there is no case, so choose a kind of business and use its goods: a sunscreen maker building stock before summer, a builders' merchant that must always have cement, a pharmacy that cannot run out of common medicines.
3. **An**: develop to sales, customers and profit: extra demand met → more sales → customers do not switch to rivals → loyalty; bulk discount → lower cost per unit → higher profit margin.

For "the purpose of JIC", the knowledge is what JIC is for (security against running out); the explanation is how the extra stock protects production or customers.

5. Evaluate the importance of supply chain management (4 questions)

Usually Paper 1 Section B (b) [12]: "Supply chain management is the most important operations factor to the success of [a kind of business]. Evaluate this view." Or Paper 2 (d) [12]: "Evaluate the importance to [case business] of effective supply chain management." Marks: 2 K, 2 App, 2 An, 6 Eval.

1. **K**: define SCM (the whole flow from suppliers to the customer) and say what success means for this business.
2. **App**: name what the supply chain of **this kind of business** actually contains: its inputs, how they arrive, how the product reaches customers. An online seller: suppliers' stock, warehouses, picking and packing, courier delivery, returns. A service or information business: its inputs, the staff who create it and the channels that carry it to customers.
3. **An**: chains both ways:
 - one missing input → the product cannot be finished or sent → orders cancelled while staff are still paid;

- stock tracked across the whole chain → less inventory needed at each stage → lower costs and cash freed;
- suppliers chosen for quality and ethics → fewer faulty goods and scandals → the brand is protected;
- against: SCM systems and specialist staff are expensive, and a business with one or two local suppliers gains little; a fast chain cannot rescue a product nobody wants.

4. **Eval**: weigh SCM against the other factors that drive success for this business: its people (skills, recruitment, motivation), marketing and branding, technology (the website or app, the equipment), quality, finance. Then judge, **for this kind of business**, and say what it depends on: how much of the value customers see is the delivery itself; how long and complex the chain is; the size of the business; how fierce competition is; external events that break chains.

6. Evaluate an inventory approach for a business (3 questions)

Forms: "Evaluate whether [case business] should introduce JIT" (Paper 2 (d) [12]); older Paper 1 essays: "Discuss the benefits of buffer inventory compared with JIT for [a kind of business]" or "Discuss the importance of effective inventory control to [a kind of business]".

1. **K** (2): define JIT (or inventory control, or buffer inventory) accurately.
2. **App** (2): use the case: what inventory the business holds now and why, its suppliers and how long it has used them, what customers value (speed, variety, freshness), its objectives, its storage.
3. **An** (2): chains for and against: lower holding costs → higher profit; cash freed → used to repay borrowing or buy equipment; against: late supplies → customers kept waiting → reputation lost; more deliveries → higher costs; no stock to meet sudden demand.
4. **Eval** (6): a clear decision **for this business**, justified by its facts, and what the decision depends on (the factors in "Which approach suits which business": supplier reliability, demand pattern, customer expectations, the product, objectives, external risks). A partial answer is often strongest: JIT for some items, a buffer for others, or a trial period with one supplier.

For "importance of effective inventory control", weigh what poor control would cost this business (stockouts, waste, cash tied up) against other things that could matter more for that business, such as its location, its prices or its brand.

7. Explain the term supply chain management (2 questions)

Paper 2 (a)(ii) [3]: 1 K + 2 App.

1. **K**: SCM is organising how products, materials and services **move** from one stage to the next. Don't explain it with its own words; say what moves.
2. **App**: show the movement through **two or more** parts of the chain: from suppliers to the business, through the business's production, and out to customers. One part only earns 1 App; two or more earn 2.

8. Calculate from an inventory control chart (1 question)

Paper 2 (b)(i) [3]: usually the total sold or used over a period. 1 mark for the method (written in words or figures), 1 for the correct totals, 1 for the answer; a wrong total used correctly still earns the method and own-figure marks.

1. List the stock level at the **top of every fall** (the opening level and each level just after a delivery).
2. List the level at the **bottom of every fall** (each level just before a delivery, and the closing level).
3. Units sold = sum of tops – sum of bottoms. Check with opening + deliveries – closing.

Variations you will meet: reading the re-order level, buffer, maximum and lead time off the chart; a usage rate from a slope; why stock fell below the buffer; using the chart's figures as application in a later part.

Worked examples

Example 1

(a) Define the term lead time. [2]

(b) Explain one advantage to a business of using Just in Time (JIT). [3]

(a) Lead time is the time between a business placing an order with its supplier (1) and the goods being delivered and ready to use (1).

(b) With JIT, materials arrive only when they are needed, so the business needs to store little or no inventory (K). For a maker of phone cases, whose designs change with each new phone model, this means it never holds thousands of cases for a phone that has just been replaced (App), so it avoids having to sell old stock at a loss or throw it away, which protects its profit margin (App).

Example 2

Harbour Paints (HP) is a paint wholesaler. Its inventory control chart for one colour of paint over 18 weeks is the last chart in "Understand it". HP's supplier normally delivers 2 weeks after an order is placed.

(a) State HP's re-order level and buffer inventory. [2]

(b) Use the chart to find how many tins of this paint left HP's warehouse over the 18 weeks. Show your working. [3]

(c) Explain what the chart shows about HP's supplier and HP's customers. [4]

(a) Re-order level: 700 tins (1). Buffer inventory: 300 tins (1).

(b) Tins out = sum of the tops of each fall – sum of the bottoms (1).

Tops: $1300 + 1300 + 1300 = 3900$. Bottoms: $300 + 100 + 600 = 1000$ (1).

$$3900 - 1000 = 2900 \text{ tins (1).}$$

Check: deliveries were 1000 and 1200 tins, so opening + deliveries – closing = $1300 + 2200 - 600 = 2900$.

(c) The second order went out in week 8, at the re-order level, and should have arrived in week 10, when stock would have been at the 300-tin buffer (1). The line kept falling at the usual 200 tins a week until week 11, so the delivery was a week late: the lead time was 3 weeks instead of 2 (1). The buffer did its job, since HP still had 100 tins and never ran out (1). After week 11 the line is half as steep, 100 tins a week instead of 200, so customers were buying less of this colour; HP may now be holding more than it needs and could order smaller quantities (1).

Example 3

SolarSmart (SS) is a private limited company that sells and installs solar panels on homes. It keeps 1,800 panels in a rented warehouse; each panel cost SS 150 dollars. The rent is 6,000 dollars a month. SS installs about 300 panels a month. Its manufacturer will launch a more efficient panel next year. SS has an overdraft on which it pays interest of 9% a year.

Analyse two costs to SS of holding a high level of inventory. [8]

Opportunity cost of cash tied up. Money spent on inventory cannot be used for anything else, and SS's working capital is reduced (K). SS has $1800 \times 150 = 270,000$ dollars tied up in panels, six months of installations ($1800 \div 300 = 6$), while it is borrowing on an overdraft (App). If this cash were freed, SS could cut its overdraft and save up to $0.09 \times 270,000 = 24,300$ dollars a year in interest (An), which would go straight to profit, or it could spend the money on advertising to win more installations (An).

Obsolescence. Inventory can lose value when a newer product appears (K). With a more efficient panel arriving next year, homeowners will want the new model, and SS holds six months of the old one (App). SS may have to sell the old panels at a discount, cutting the margin on each installation (An), and anything still unsold may never be sold, so the 150 dollars a panel already paid becomes a loss that lowers the profit available to reinvest in the business (An).

Each cost earns K + App + a developed chain, so $2K + 2App + 4An = 8$.

Example 4

Coastline Kayaks (CK) makes 4,000 plastic kayaks a year by batch production, each from 20 kg of plastic granules. 65% of its kayaks are sold in the four summer months, often to shops that order at short notice. CK keeps 20,000 kg of granules, costing 1.50 dollars per kg, in a store it leases for 2,500 dollars a month; the lease ends this year. CK's managers are considering JIT for granules. A supplier with a depot 30 km away, which has delivered CK's packaging on time 47 times out of its last 50 deliveries, would deliver twice a week, but at 5% more per kg. When CK's moulding machines stop for lack of granules, restarting them takes two hours.

Evaluate whether CK should introduce JIT for its plastic granules. [12]

Knowledge. JIT means ordering inventory so that it arrives just as it is needed for production, so that little or none is stored (K). The aim is to cut the costs of holding stock (K).

For JIT. CK uses $4000 \times 20 = 80,000$ kg of granules a year, so its 20,000 kg store is three months' supply worth $20000 \times 1.50 = 30,000$ dollars (App). With JIT, CK would not renew the lease and would save $2500 \times 12 = 30,000$ dollars a year in rent (App), lowering its fixed costs and raising profit (An); the 30,000 dollars of cash now in granules would be freed to spend on new moulds or marketing (An).

Against JIT. The 5% price rise costs $80000 \times 1.50 \times 0.05 = 6,000$ dollars a year, because CK loses the low price of large orders. More serious is reliability: 47 on-time deliveries out of 50 is 94%, so about one delivery in every seventeen is late. With no stock, a late lorry stops the moulding machines, and each stop costs two hours of output even after the granules arrive (An). In summer, when shops order at short notice, a stopped line means orders missed, and shops may switch to a rival kayak brand for the season (An).

Judgement. On cost alone, JIT looks clearly better: about 30,000 dollars saved against 6,000 dollars extra (Eval). But CK's success depends on the summer, when 65% of its kayaks sell and a missed order may lose a shop for the whole season, and the supplier's record, though good, is with packaging, not granules (Eval). So CK should adopt JIT, but not in its pure form: it should keep a small buffer, about one week of summer production (around $2600 \div 17.3 \approx 150$ kayaks a week, so about 3,000 kg), which needs far less space than the current store (Eval). It should also agree in the contract what happens when a delivery is late, and review the supplier's record for granules after the first season before running the buffer down further (Eval). The decision depends most on how reliable the supplier proves to be in peak season; if late deliveries become common, the savings will not cover the lost summer sales (Eval).

The marks: 2 K, 2 App, 2 An, and 6 Eval for a supported judgement in CK's context that weighs costs against the risk to summer sales and says what it depends on.

Common mistakes

- **Mixing up JIT and JIC, or buffer inventory and JIT.** Examiners report this in the reports for June 2021 and March 2026. JIC and buffer inventory both mean **holding extra** stock; JIT means holding **as little as possible**. Check the term before you write a word.
- **Half a definition.** A lead time with no starting point, or a buffer with no mention of inventory (November 2021, June 2022). Each definition has two elements; write both.
- **Treating re-order level as a time or a routine.** It is a **quantity** of stock that triggers an order (June 2021). On a chart it is a horizontal line, read off the vertical axis.
- **Calling inventory the place where goods are kept** (March 2026). Inventory is the goods; the warehouse is where they are stored.
- **Generic answers on a case.** Points about storage or JIT that would fit any business stay at the bottom of the application marks. Use what the business stores, its suppliers, its customers and its numbers.
- **Writing more points than asked for.** Only two count on an "analyse two" question (November 2021); extra points use up time that should go into developing the two.

- **Stopping at the first link.** "JIT reduces storage costs" is knowledge; carry it on to costs, profit and what the business does next.
- **Supply chain management as inbound only** (March 2023). Show the flow from suppliers, through the business, and out to the customer.
- **Not answering "most important"** (June 2023). Explaining why SCM is useful is analysis; the evaluation marks need a comparison with other factors and a judgement for the named kind of business.
- **A one-line judgement** (March 2025). A bare verdict at the end earns little. Give the reason that settles it for this business and the condition that could change it, and don't use the last paragraph to repeat your analysis.
- **Short answers to 5-mark questions** (June 2022). Five marks need one reason explained in full, with application and a chain of consequences, not a sentence.

How to get the marks

- **Command words.** *Define*: the precise meaning, both elements. *Explain*: a point, then why or how, using the case if there is one. *Analyse*: points developed through chains of cause and effect, no judgement needed. *Evaluate* or *Discuss*: both sides, then a supported judgement.
- **[2] define**: one sentence with both elements. Partial definitions earn 1.
- **[3] explain one ... (Paper 1)**: 1 K for the point, then 2 for explaining it in two developed steps; one vague sentence earns 1 or 2.
- **[3] explain the term (Paper 2)**: the term (K), then application. For supply chain management, show movement through at least two parts of the chain.
- **[3] calculate**: method, totals, answer with units; a wrong total used correctly still earns marks.
- **[5] analyse one reason**: no marks without a valid reason; then application (2) and a developed chain (2) on that one reason.
- **[8] analyse two**: exactly two points, each with knowledge, a case fact and a chain of two or more links. No definitions of the term and no judgement are needed.
- **[12] evaluate**: 2 K, 2 App, 2 An, 6 Eval. The top band needs a **judgement in context**: a clear decision for this business, supported by its facts, and what it depends on. Judgements can come anywhere in the answer, not only at the end. A judgement that would fit any business stays below the top band.
- **Use the numbers.** A short calculation from the case (inventory value, months of stock, a supplier's on-time rate) is strong application.

Quick check

1. A guitar maker holds: (a) planks of spruce; (b) guitar bodies glued but not yet varnished; (c) boxed guitars waiting to be sent to shops; (d) packets of strings to fit at the last stage. Name the kind of inventory each one is.

2. A hardware shop sells 60 bags of cement a day. Its supplier's lead time is 4 days and it keeps a buffer of 90 bags. (a) Calculate its re-order level. (b) Each order is for 600 bags. What is its maximum inventory when deliveries arrive on time?
3. Define the term Just in Case (JIC), and state one way it differs from JIT. **[2]**
4. Explain the term supply chain management, using a flower-delivery business as an example. **[3]**
5. Explain one reason why a mobile-phone retailer might choose to hold low levels of inventory. **[5]**

Answers

1. (a) Raw materials. (b) Work in progress. (c) Finished products. (d) Raw materials (components bought in, not yet used).
2. (a) $\text{Re-order level} = 90 + 60 \times 4 = 330$ bags. (b) $\text{Maximum} = 90 + 600 = 690$ bags.
3. JIC is a way of managing inventory in which a business keeps extra stock (1) so that it can cope with unexpected demand or a late delivery (1). JIT is the opposite: stock arrives only when it is needed, so very little is held.
4. Supply chain management is coordinating the movement of goods and services from suppliers to the final customer (K). For a flower-delivery business, it means arranging for fresh flowers to arrive from growers each morning (App) and then organising the drivers and routes so that bouquets reach customers' homes on the day they were ordered, while the flowers are still fresh (App).
5. A reason: to avoid losses from obsolescence (K). New phone models are launched several times a year, and when they arrive the older models lose much of their value (App), so a retailer holding large stocks of an older model would have to cut its price heavily (App). Each discounted phone earns a lower margin, or even a loss, on money that was spent months earlier (An), so by keeping inventory low and ordering often the retailer protects its profit and keeps cash available to stock the new models customers want (An).

Past questions to try

- **9609/13/M/J/22 Q3:** why a business might hold low levels of inventory.
- **9609/11/M/J/23 Q5:** part (a), two benefits of holding high levels of inventory; part (b), whether supply chain management is the most important activity for a car maker.
- **9609/22/O/N/23 Q2:** part (c), two possible impacts of adopting JIT.
- **9609/12/M/J/22 Q5:** part (b), the importance of effective inventory control to a hotel.