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THE MEANING OF PRODUCTION

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Learning Outcomes

1. Managing resources effectively to produce goods and services
2. Difference between production and productivity
3. Benefits of increasing efficiency and how to increase it.
4. Calculation of productivity
5. Why businesses hold inventories (stocks)
6. Concept of lean production
7. Examination practice



Operations Management

Producing and providing goods and services to customers (business and individual). Used to be known as Production management.

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Key roles:

Designing product to meet customer needs

Establishing a supply chain

Working with suppliers

Managing quality

Using technology effectively to ensure the whole process runs smoothly.

Productivity

In pairs, produce a suitable definition of PRODUCTIVITY

How would you measure the productivity of a business?

Why may it be hard to measure the productivity of staff who work in service industries?



Productivity
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List all the things you see in the video that you think help day-to-day life.

Labour Productivity

Output per period

Number of employees per period

$$\frac{20,000,000}{48,000} = 416 \text{ per items per person}$$

	OUTPUT	NUMBER OF STAFF
LAST YEAR	32,000	50
THIS YEAR	30,000	40

Calculate the change in productivity using the figures above.

What do you think the firm did to improve its productivity? Use an example to explain.



Discussion

How do you think motivation and productivity might be linked?

Motivation means...

Productivity means....

Therefore,....



Maximising efficiency

To maximise efficiency a company has to decide how many workers to employ and how many machines it should purchase.

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Define the following terms

Labour intensive

Capital intensive



Those on this side of the room
need to think of advantages of
labour intensive production

Those on this side of the room
need to think about advantages
of capital intensive production

End

What kind of firms would
more likely be labour
intensive and which are
more likely to be capital
intensive?

Individual activity

- Complete the labour intensive and capital intensive worksheet
- Share your answers.

Paired activity

- Identify ways to improve productivity
- Explain the outcome of this for the business

Ways to Improve Productivity

- Training – its costs money to train workers in the short term but the better trained workers tend to work harder and be more productive.
- Better Equipment – replacing old equipment with new equipment or introducing new technologies. (like the video)

Ways to Improve Productivity

More effective work practices – this can be things like improving the IT systems (so they aren't slow).

Cutting jobs (although nobody wants to lose jobs).

Improved management skills where you can get the most out of employees and result in you needed fewer staff.

Ways to Improve Productivity

There are also other ways;

Improved purchasing - shopping around for materials.

Relocation – move to cheaper places or nearer to your market.

Better Design – looks better and could be made using different or less materials.

Outcome

Improving Productivity is likely to lead to lower costs.

Managers must keep costs down to ensure cost-effective operations.

Lower costs can allow business to have more competitive prices.

Methods of monitoring productivity

- Changes over time
- Comparison against other firms
- Performance against targets

Calculate Labour Productivity and Turnover for each year

	Year 1	Year 2	Year 3	Year 4
Average number of employees	42	41	42	43
Number of leavers	3	6	2	2
Value of output £	1,500,000	1,300,000	1,600,000	1,800,000

Examination practice

- Complete the past paper question and submit for assessment.

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Types of Stock



**Raw Materials,
Components,
Etc.**

**Work in Progress
(unfinished
work)**

**Finished
Goods**

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Having stocks enables: -

- Goods to be available for production
- Delivery to customers
- Shows the goods available for production
- Enables customer demands to be met
- Allows discounts to be given for bulk buying

Control of Stock

- Usually store person or stock controller's responsibility to avoid
 - Theft
 - Waste
 - Shortage
- They should ensure that stock is
 - Monitored
 - Controlled
 - Recorded

Can you identify a potential issue with this process. Suggest a possible solution.

The Importance of Stock Control - Excess stock

- High storage costs
- High Maintenance costs
- High security costs
- High Insurance costs
- Lighting and handling costs
- Large space being utilised
- Money tied up in stock = less money to spend on other business items
- Stock may become damaged = spoilage
- Stock may become obsolete = reduced selling price = less profits
- Theft by employees

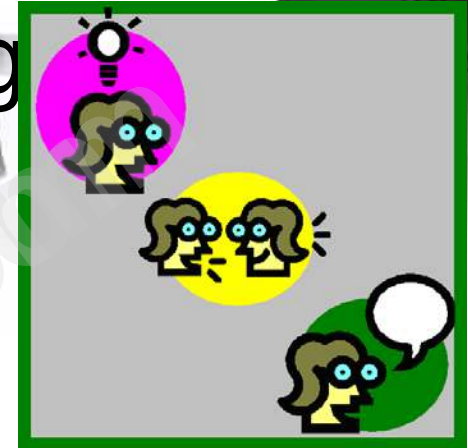


Key factors in efficient stock management. Explain briefly:

- What is stock rotation?
- Using examples, explain the two methods of stock rotation.
- How can stock rotation help to minimise the costs of holding stock?
- Why do firms need higher buffer stocks when there's a long supplier lead time?
- Why is laser scanning so helpful in keeping stock levels low?

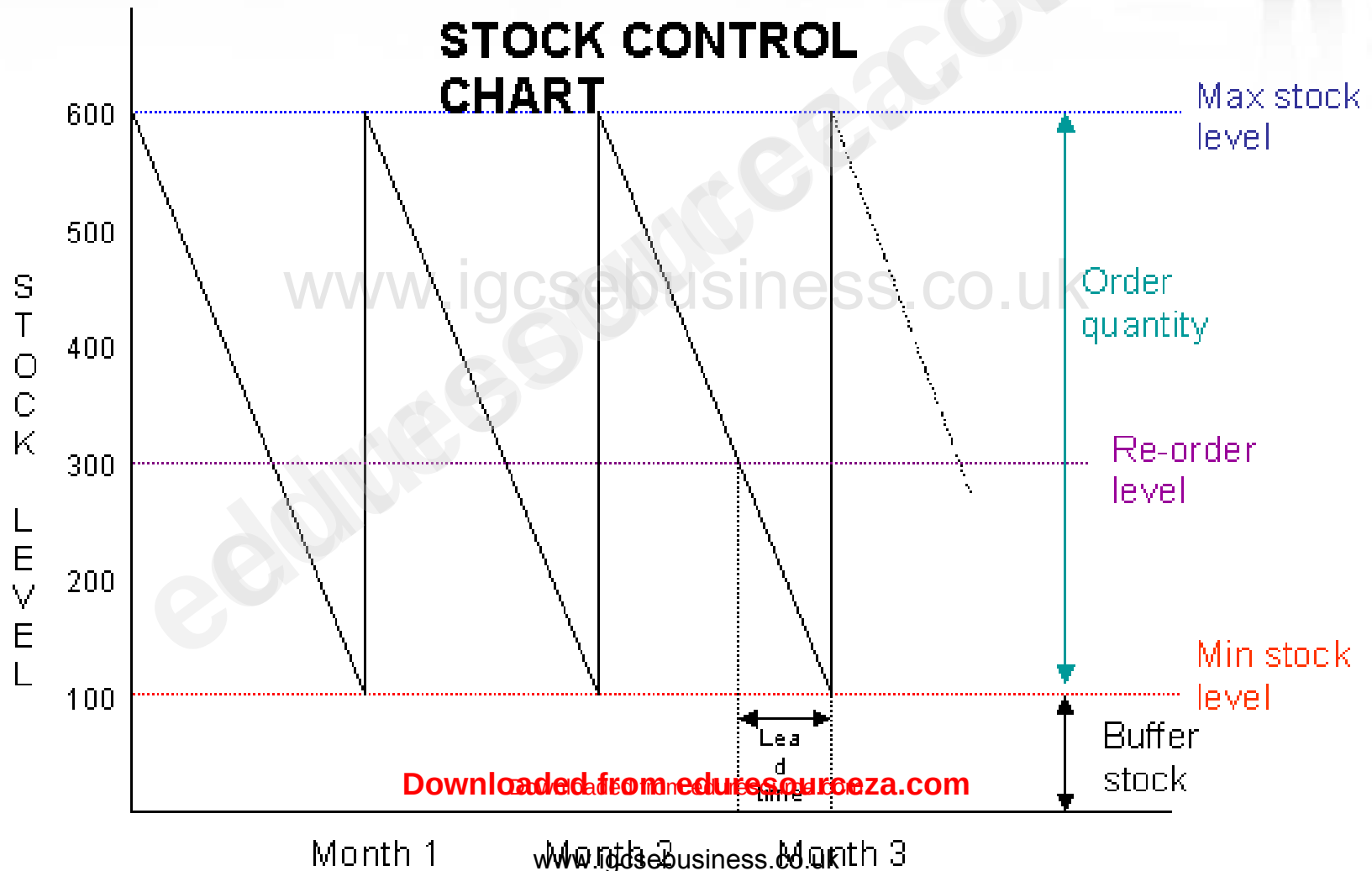
Factors Influencing Stock Levels

- The level of demand
- Unpredictability of demand
- Degree of spoilage/perishability
- Rental costs for storage
- Bulk-buying discounts
- Reliability of suppliers
- Competition - luxury/necessity



In your pairs fully explain why these points are important.

In your own words, write an explanation for each of the labels on the diagram.



- Maximum stock levels (economic level)
- Minimum stock levels
- Rate of consumption
- Lead time - ordering to receipt
- Re-order level

Elements of Stock Control

Maximum Stock Level (economic level)

- This is the level of appropriate stock which should be held for the organisation to minimise costs.
- When setting this level a business should take into account
 - **Storage Space Available**
 - **Stock Security Measures**
 - **Cost of Storage Facilities**
 - **Finance to be tied up in stock**

**Explain why
these points are
important.**

Minimum Stock Level

- A minimum stock level is the level that stock must not fall below as shortages in raw materials may result in reduced output.
- When setting this level a business should take into account
 - Ordering times
 - Delivery times
 - Rate of sales

**Explain why
these points are
important.**

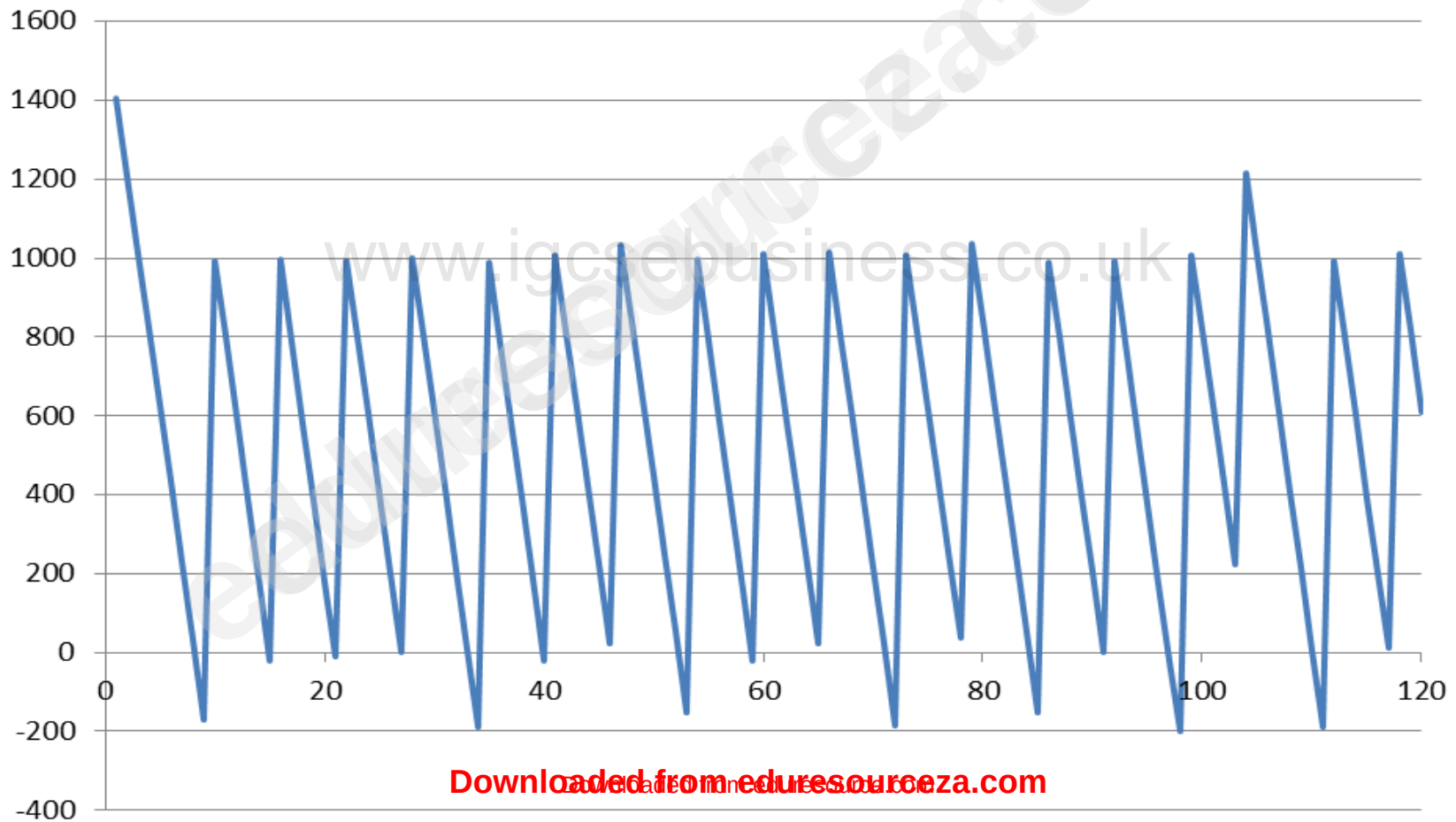
Re-Order Level

- This is the point at which new stocks should be ordered. As items are taken from stock, the amount left for use reduces and at some point new stock has to be ordered.
- This is calculated by considering average daily usage and the time taken to receive new supplies – **THE LEAD TIME.**

Re-Order Quantity

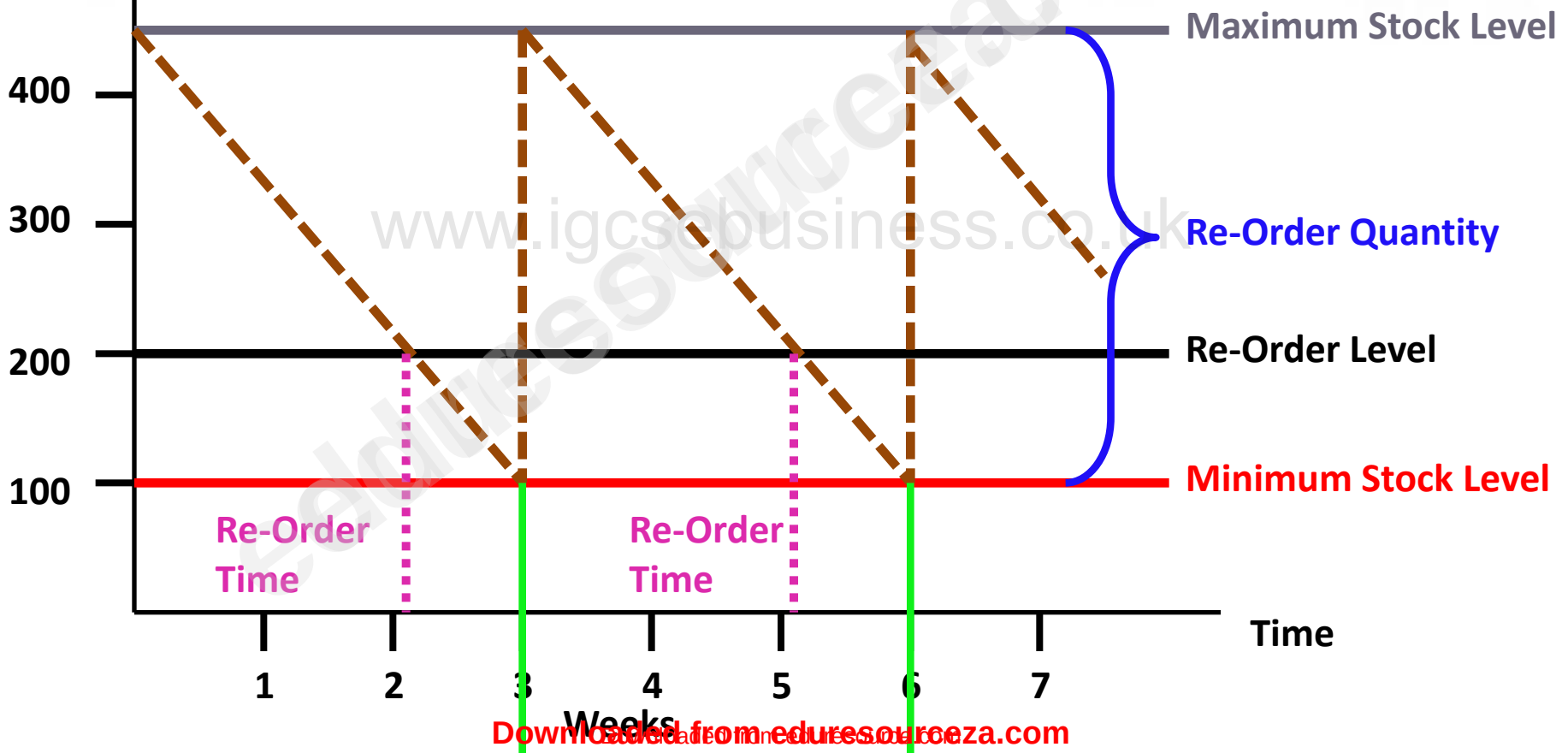
- Once the re-order level is reached, a standard quantity is automatically requested. On receipt of the delivery, the maximum stock level should be achieved.

Virtual Closing Stock



Stock
Level

Effective Stock Control - review



Delivery Time

Control of Stock

Control is ensured through the following procedures

- Stock can only be issued after receiving a stock requisition
- Stock levels are recorded
 - manually on stock record cards
 - Electronically on a database

Manual Stock Control

STOCK CARD

Stock Item: Woollen jumpers		Location: Aisle 16	
Stock Code: WJ		Supplier: Merino Mills	

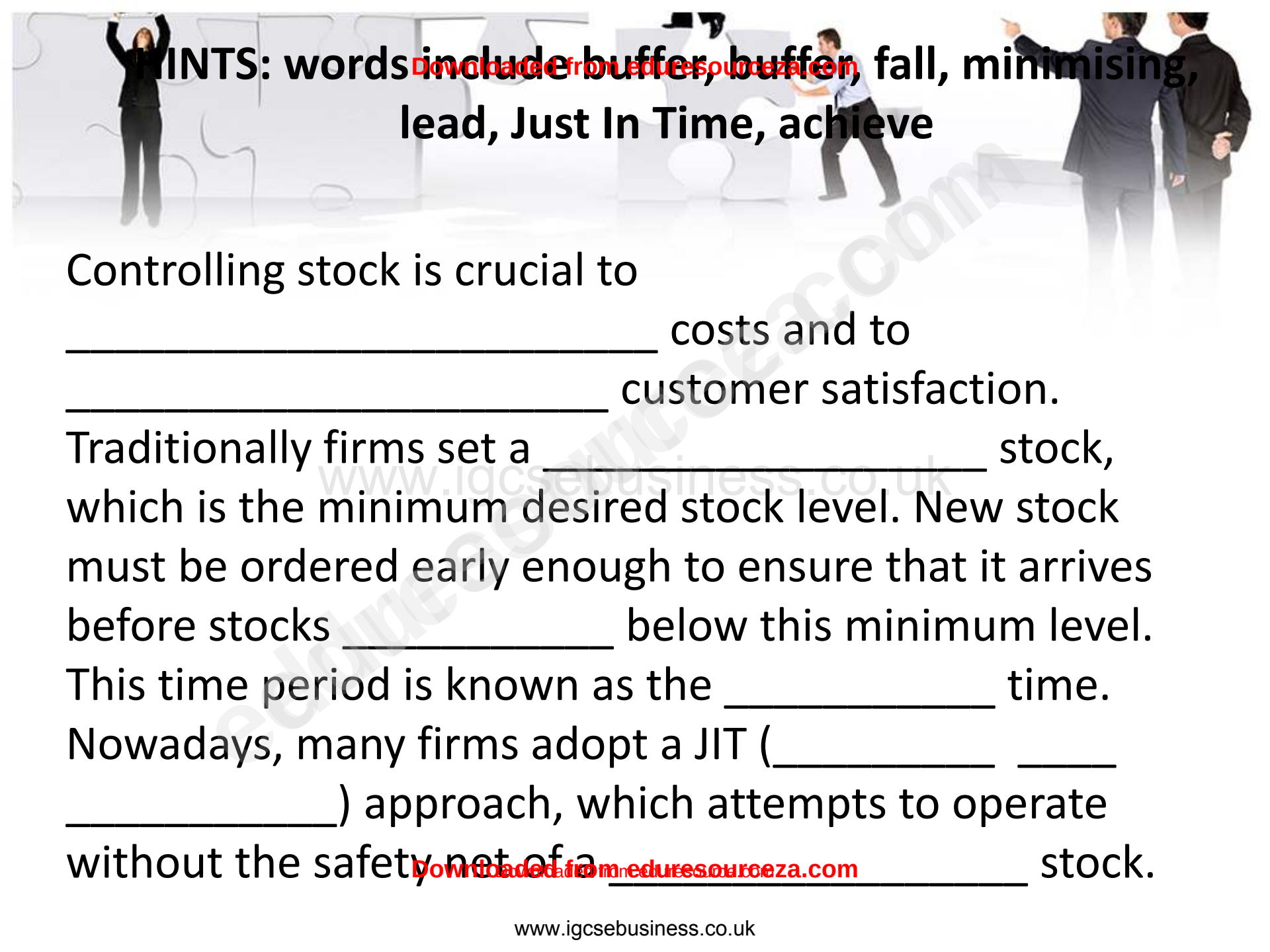
		IN			OUT			BALANCE		
Date	Details	Qty	Unit cost	Value	Qty	Unit cost	Value	Qty	Unit cost	Value
July 1	Balance							8	30	240

Amazon Warehousing

Watch the video and analyse the process used by Amazon.

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HINTS: words include buffer, buffer, fall, minimising, lead, Just In Time, achieve

Controlling stock is crucial to _____ costs and to _____ customer satisfaction.

Traditionally firms set a _____ stock, which is the minimum desired stock level. New stock must be ordered early enough to ensure that it arrives before stocks _____ below this minimum level. This time period is known as the _____ time. Nowadays, many firms adopt a JIT (_____ _____) approach, which attempts to operate without the safety net of a _____ stock.

Electronic Stock Control

Scan/Manual

Search Customer Search Stock

Item list

1	Ambrosia Creamed Rice	£0.87
1	Ambrosia Creamed Rice	£0.87
1	Asda Peeled Plum Tomatoes (La...	£0.28
1	Carrots and Peas in water	£0.77
1	Heinz Baked Beans	£0.42

Quick Links

Log Out More Options Exit ERS

Receipt information

Peter Parker

Receipt: 0
Date: 22/07/0
Time: 10:31

Receipt Totals

Items: 5
Net: £2.89
VAT: £0.32
Total: £3.21

Payment by

Cash Cheque Card

Keypad entry

7	8	9	10.00	↑	↓
4	5	6	20.00	←	→
1	2	3	50.00	QTY	PRICE
.	0	.00	100.00	Enter	

New Receipt Cancel Receipt

- Relational Database System
- Interlinked between departments
- Quick reporting
- Easily accessible
- Can be linked to supplier or customer
- Can be linked to scanner for bar-coding
- Highlights slow sellers and best sellers
- Can be very expensive to set up

Just In Time (JIT)

Japanese approach to production that involved keeping the stock levels (and costs!!) to a minimum.

Stocks arrive just in time to be used in production.

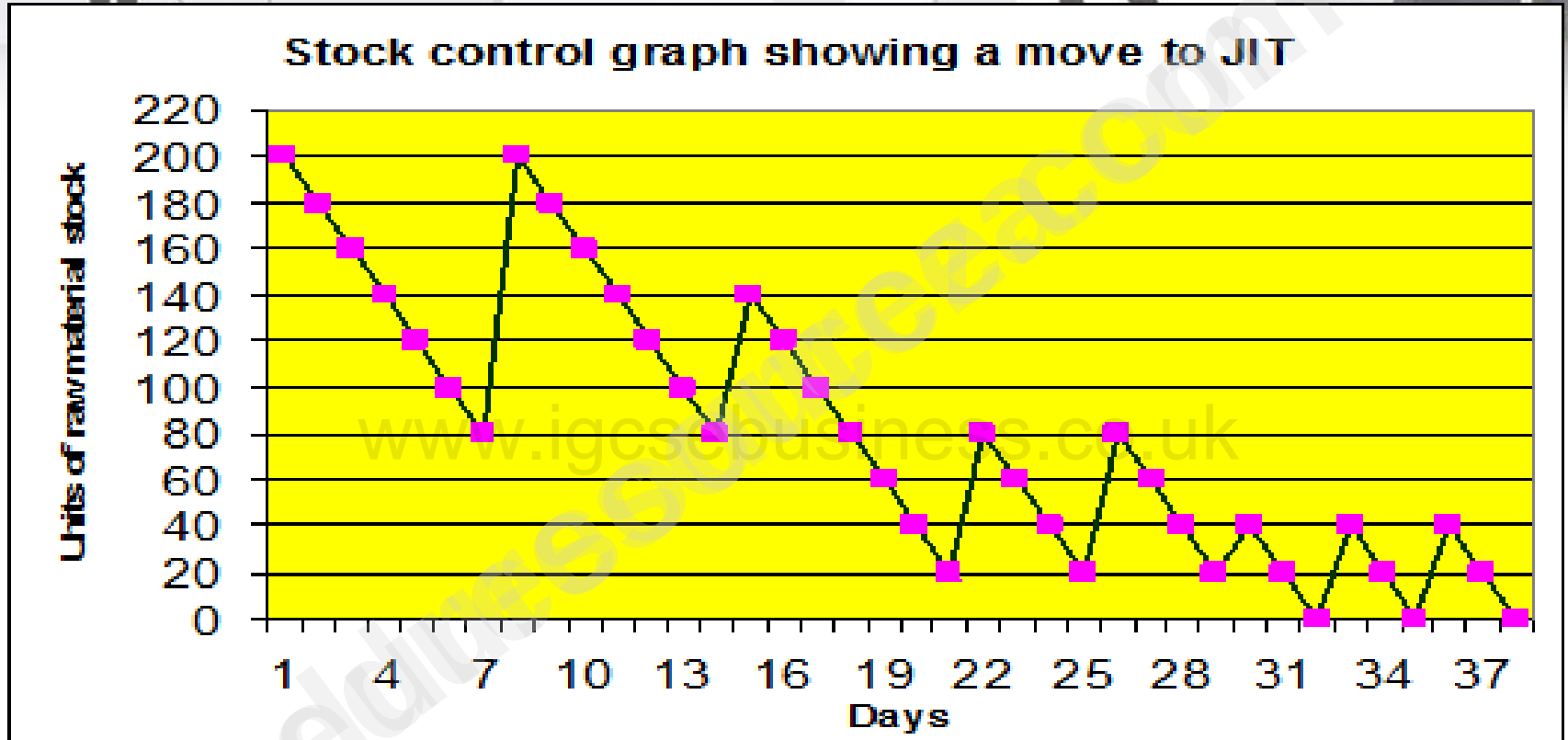
Goods are not produced unless the firm has an order from a customer.

The success of JIT depends on:

- ✓ reliable suppliers
- ✓ Good quality control procedures
- ✓ Access to a supply of skilled workers



Change from buffer stock system to JIT



Explain what happened to the level of buffer stock over the whole period.

How would this help this business?

Explain one possible danger of the reduction in buffer stock.

Just-in-time Advantages

- ✓ Stock exactly matches production
- ✓ Improves cash flow (less tied up)
- ✓ Savings on purchase and storage costs
- ✓ Less stock wastage
- ✓ Production delays prevented
- ✓ Can respond to changes in demand
- ✓ Close ties with suppliers established

Just-in-time Disadvantages

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- High dependency on suppliers to meet delivery and quality standards
- Suppliers must be willing to participate
- Increase in order processing costs
- Danger of lost sales
- Less time for quality control on arrival of materials
- Increased ordering and administration costs
- May lose bulk-buying discounts
- Increase in suppliers' transport costs
- Increased chance of transport failures
- Increased volume of traffic on road

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suppliers, deliveries, stock control, lead times, buffer stock

Just In Time is a system of stock control which involves minimizing the level of holding stock. Ideally a Just In Time system would result in zero _____ and therefore a system must be developed to ensure that the costs and risks of running out of stock are avoided. JIT needs to be thought of as a production philosophy rather than merely a method of _____. In order to develop a successful Just in Time system a firm needs to work closely with _____ as the system relies on frequent _____ and short _____. _____.

Kanban

- Japanese system.
 - Uses markers (flags or lights) to order movement of stocks between different stages of production.
 - **Flag up**
 - Stock item should be re-ordered
 - **Markers**
 - Used to tell the stockroom to take a part to the production line destination
 - Can also be used to tell employees to
 - **begin production**
 - **Add output to stock**

Operational Flow of Parts

Retrieval Kanban



- 2** The operator carries the kanban to retrieve replacement parts.

< Next process >

- 1** The parts retrieval kanban is removed when an operator uses parts.

3

- The operator removes the production instruction kanban and replaces it with a parts retrieval kanban.

4

- Parts displaying the parts retrieval kanban are transported to the next process.

Storage of Stock

- Supplies of stocks can be held in one central storage area (Centralised) or be located in different areas in which they are used (decentralised).

In your groups analyse the process of having centralised and decentralised stock.



Advantages of centralised stock storage

- Improved security from loss or theft as it tends to be carefully controlled by specialist staff
- Specialist staff maintain stocks by following agreed procedures for its control – only issued when ‘authorised’.
- Central stock of components or materials may cost less to hold than many small ‘on-site’ supplies.
- Improved efficiency in stock handling and management.

Advantages of decentralised stock storage

- Stock is always 'at hand' when required.
- Orders of new stock reflect actual production usage or sales levels.
- Speedier turnover of a small quantity of stock reduces the likelihood of its deterioration or decay.

Between firm & Suppliers

- > get components on time & right quantity
- > build a relationship with supplier, involve in R & D
- > between departments

Management & Workers

- > management stating the firm's objectives
- > feedback from workers, continuous improvement
- > motivation

With customers

- > customers' orders
- > customer service
- > market research

Task: Use the above bullet points to answer the following question in the form of a developed written exam answer using paragraphs to structure your answer;

Discuss the importance of communication in the success of a Just In Time production system. (12)

A conceptual image showing four business professionals in a white space, working together to assemble large, light-grey puzzle pieces. One woman on the left is placing a piece into the top of a structure. A man in the center is pushing a piece into place. Two men on the right are looking at a piece being placed. The scene is brightly lit with soft shadows.

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MAIN METHODS OF PRODUCTION

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Learning objectives

- Features, benefits and limitations of job, batch and flow production
- Recommend and justify an appropriate production method for a given situation

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Introduction to methods of production



Production Methods

Production can take place in different ways depending on the type and quantity required of the product...



JOB

BATCH

FLOW

Job Production

- Making **one** thing at a time
- Used for individual, unique products
- When work on one product is finished, production of another can begin

EXAMPLES: Ships, bridges, made-to-measure clothes, wedding cake



ADVANTAGES:

Easier to customise an item

DISADVANTAGES:

Expensive, takes a long time and requires highly skilled labour.

FLOW/MASS PRODUCTION

- ✧ Producing as many as possible of an identical product
- ✧ Used for mass market products
- ✧ Usually highly automated
- ✧ Production is continuous with no stoppages (shift work)

EXAMPLES: Fizzy Drinks, Mobile Phones, Televisions

ADVANTAGES:

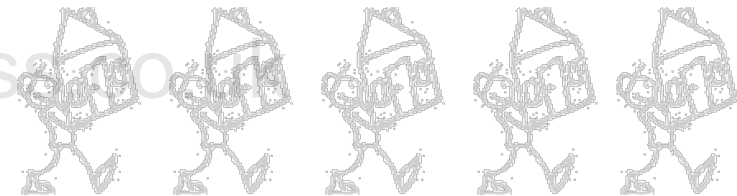
Economies of scale; Can sell at competitive prices

DISADVANTAGES: Need to invest lots of money; Machinery can break down

BATCH PRODUCTION

- Combination of job and flow production
- Make a limited number of one identical product then stop, reorganise and make a batch of something else

EXAMPLES: Houses, Bread,
Different Sized Clothing; Milk



ADVANTAGES

Less waste than job production; Can produce things in limited quantities

DISADVANTAGES

Requires equipment and good management skills

Production in Action

- A business may use a combination of all three types of production at different times depending on product or customer needs.

- **MASS:** Most BMW cars
- **BATCH:** Most expensive top-of-the range
- **JOB:** Custom make cars full of unusual gadgets (James Bond).



Evaluation

★ What were the good and bad points of each production method?



★ What was the quality like? Why is this important?

★ How much waste did you have?



Name and Explain the Definition...

The production method that combines elements of job production and flow production...

BATCH PRODUCTION

JOB PRODUCTION

Producing one good at a time

When products are of good standard...

QUALITY

Why the cost of producing each unit decreases because you are producing more...

ECONOMIES OF SCALE

FLOW PRODUCTION

A continuous production of goods

A worker concentrates on one specific task

SPECIALISATION

