

Foreword

ESP has become one of the most significant fields in higher institutions, as a matter of fact; English is learnt for many reasons which are due to a large variety of professions which request the use of ESP. The need to use English for specific purposes specialities has many characteristics. One of the reasons for learning English is for science and technology, therefore, ESP can be subdivided into two fundamentals sorts of ESP differentiated according to learners' need. It means that ESP is divided into Academic study or for occupational purposes. As the Susperior School of Applied Sciences comprises different branches of engineering more precisely Industrial Engineering; it is necessary to clarify and shed light on our English lectures. Therefore, we will explain and detail our lectures in the following handout.

The present handout of Industrial Engineering module is composed of five units which are as follows :

Unit One : Technology in Use

Unit two : Material Technology

Unit Three : Technical English for Industrial Engineers

Unit Four : Health and Safety at Work

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Unit One

Technology in Use

1- Introduction to Engineering

Engineers solve problems using math, science, and technology. They also design products that are useful for humans. To become an engineer you need a degree in Engineering that will provide you with a broad background in math, science, and technology, as engineers use these skills to solve problems on a daily basis. Besides the broad background, engineering students also choose a specialisation in some branches of engineering. Engineers in each branch have knowledge and skills that can be applied to many fields and can contribute to solve many different types of problems. Since many engineering projects encompass multiple problems to solve, engineers in one field often work closely with specialists in other fields, including scientists.

Engineering is based principally on physics, chemistry, and mathematics, and their extensions into materials science, solid and fluid mechanics, thermodynamics, transfer and rate processes, and systems analysis.

Engineering as a profession involves different tasks. It can refer specifically to the manufacture or assembly of engines, machine tools and machine parts. It is also used more generally to describe the creative application of scientific principles to design, develop, construct and forecast the behaviour of structures, apparatus, machines, manufacturing processes and works. The function of scientists is to know, while that of engineers is to do: they must solve specific problems.

Task One : answer the following questions from the text

- 1-What is engineering based on ?
- 2-What is the task of an engineer ?
- 3-What does the word encompass mean ? (choose the right one)
Realize/ *include* / make
- 4-What does the word forecast mean ?
Find/ *predict*/ improve

Task Two : complete the extract with the appropriate words

Engineering students should have an understanding of maths, (a)..... and chemistry. Working with pharmaceuticals, food, mineral processing and chemical manufacturing, a (b).....engineer is trained to understand, design, control, and investigate material flows. If you enjoy problem solving and find projects such as the Channel Tunnel and the Three Gorges Dam interesting, (c).....engineering may be for you. You will produce creative designs at an economical price while paying due concern to the environment. If your interest is in road building then you may decide to follow a specialised course in (d)..... engineering. By studying (e)..... and (f)..... Engineering you learn about the design of complete systems, such as computers, controllers, power and transport systems. (g)..... engineers plan, design and (h)..... a wide range of things: washing machines, cars and spacecraft.(i)..... engineers work very closely with mechanical engineers, to make new products at the right price, on time and in the correct quantity. As well as designing and selecting (j)..... and materials, they also organise people and finance.

Key Answer

Task One :

- 1- Engineering is based principally on physics, chemistry, and mathematics, and their extensions into materials science, solid and fluid mechanics, thermodynamics, transfer and rate processes, and systems analysis.
- 2- The task of an engineer is to
- 3- Encompass means « include »
- 4- The word forecast means « predict »

Task Two :

Engineering students should have an understanding of maths, (a)...*physics*..... and chemistry. Working with pharmaceuticals, food, mineral processing and chemical manufacturing, a (b).....*chemical*.....engineer is trained to understand, design, control, and investigate material flows. If you enjoy problem solving and find projects such as the Channel Tunnel and the Three Gorges Dam interesting, (c)...*civil*.....engineering may be for you. You will produce creative designs at an economical price while paying due concern to the environment. If your interest is in road building then you may decide to follow a specialised course in (d).....*highway*..... engineering. By studying (e).....*electronic*..... and (f)...*electrical*..... Engineering you learn about the design of complete systems, such as computers, controllers, power and transport systems. (g).....*mechanical*..... engineers plan, design and (h).....*develop*..... a wide range of things: washing machines, cars and spacecraft.(i).....*production*..... engineers work very closely with mechanical engineers, to make new products at the right price, on time and in the correct quantity. As well as designing and selecting (j).....*machines*..... and materials, they also organise people and finance.

2- Modern Technology

Modern technology is changing the way we live our lives. Clever gadgets make everyday activities easier and enable people to use their time effectively. But what impact will this change have in the future and is it really a positive thing? People are busier than ever before. Technological advances mean that things are often possible with the touch of a button. A hundred years ago, however, things were very different. Everyday jobs, like doing the laundry, would take a whole day, and the telephone was a new invention! Nowadays, almost every household has a washing machine and a dishwasher, and there are more than 70 million mobile phones in use in the United Kingdom alone.

Research shows that around 28% of children in the UK are overweight or obese. Some people are concerned that this is because young people spend too much time online and not enough time socialising with their friends and playing outside. In the past, nearly all children walked to school because their parents didn't have a car. They didn't have all the luxuries that many children have now, so they used their imaginations and played outdoors in the fresh air.

Years ago, when people wanted to stay in touch with their friends and family, they wrote letters. These days, however, E-mail communication and social networking sites, such as Facebook, allow instant, free international communication.

Online banking and shopping make essential activities possible from the comfort of our own homes. But what effect will this have on town centres and shops? In some towns and cities, many shops are now empty, and a lot of people think this is because more and more people choose to use the Internet for shopping.

There are many benefits of using technology but we need to be responsible in the choices we make. Modern equipment is often very expensive and does not last a long time. It is important to consider how much we really need these things and the impact they have on our health, the environment and society.

(Facts sourced from <http://www.dh.gov.uk>)

Task 1

Vocabulary – Pre-reading task

- Words/ phrases 1-10 are taken from the text you will read later in the lesson
- Match the words / phrases with definitions a – j

1. gadget	a. to make a situation possible or help a person do something
2. enable	b. to contact someone regularly and maintain a relationship with them
3. impact	c. a piece of equipment which has a particular function, and is often new or involving technology
4. button	d. something which happens immediately
5. invention	e. the effect one thing has on another thing, which can be positive or negative
6. luxury	f. a new idea for a product which has never been made before
7. stay in touch	g. a small item which, when pressed makes a machine work
8. social networking	h. something which is expensive and enjoyable to have, but not necessary
9. instant	i. necessary for survival
10. essential	j. The process of communicating and connecting with people online, often through websites designed for this kind of activity

Task Two : give title for each paragraph

Task Three : Write a paragraph about new modern technologies

Answer keys

c/1 a/2 e/3 g/4 f/5 h/6 b/7 j/8 d/9 i/10

Task 2

Give title for each paragraph (answers proposed)

1. Our responsibility when choosing to use modern technology.
2. The impact of modern technology on everyday life over the past century.
3. How modern technology has changed communication.
4. The effect of modern technology on young people.
5. Modern technology in relation to shopping and retail.

Task 3 : Correcting the paragraphs

3- Describing Technical Functions and Applications

1/ Text One : Space Elevator preparing for take off

In his 1979 novel, *The Fountains of Paradise*, Arthur C. Clarke wrote about an elevator connecting the earth's surface to space. Three decades later, this science fiction concept is preparing to take off in the real world.

NASA has launched the Space Elevator Challenge, a competition with a generous prize fund and several teams and companies are working on serious research projects aimed at winning it. As its name suggests, a space elevator is designed to raise things into space' Satellites components for space ships, supplies for astronauts in space stations, and even astronauts themselves are example of payloads that could be transported into orbit without the need for explosive and environmentally unfriendly rockets. However the altitude of orbital space - a colossal 35,790 km above the earth - is a measure of the challenge facing engineers. How could such a height be reached?

The answer is by using an incredibly strong and lightweigh strong enough to support its own weight and a heavy load' The design of such a cable is still largely theoretical this would be attached to a base station on earth at one end and a satellite in geostationary orbit (fixed above a point on the equator) at the other. Lift vehicles would then ascend and descend the cable, powered by electromagnetic force and controlled remotely.

Task One : In pairs, discuss the following questions.

1. How do you think a space elevator would work?
2. What could it be used for?
3. What technical challenges would it face?
4. How seriously do you think the concept of space elevators is being taken at present?

Task Two : Match the verbs (1 -9) from the text in Exercise 6b to the definitions (a-i)

- | | |
|----------------|------------------------------------|
| 1. Connecting | a. carried objects over a distance |
| 2. Raise | b. hold something firmly |
| 3. Transported | c. climb down |
| 4. Support | d. provided with energy |
| 5. Attached | e. joining |
| 6. Ascend | f. driven/have movement directed |
| 7. Descend | g. fixed |
| 8. Powered | h. climb up |
| 9. Controlled | i. lift/make something go up |

Task Three : James, an engineer, is giving a talk on space elevators. Complete his notes using the correct form of the verbs (1-7) in Exercise 2.

Challenge ofa satellite to earth by cable is significant.

Toits own weight, and be securelyat each end, cable would need phenomenal strenght to weight ratio.

How could vehicles beinto space, up cable ?

Self-contained energy source problematic, due to weight (heavy fuel or batteries required tovehicle).

Two possible ways round problem :

1. Transmit electricity wirelessly. But technique only at research stage.

2. Solar power, but would only allow vehicle toslowly. Not necessarily a problem, as car could be controlled remotely , allowing it topayloads unmanned.

Answer key

Task One :

- 1- A space elevator by using an incredibly strong and lightweigh strong enough to support its own weight and a heavy load.
- 2- It could be used for raising things into space' Satellites components for space ships, supplies for astronauts in space stations.
- 3- The technical challenge it would face is the altitude of orbital space - a colossal 35,790 km above the earth - is a measure of the challenge facing engineers.
- 4- Different answers proposed by students

Task 2 2/1 3/a 4/b 5/g 6/h 7/c 8/d 9/f

Task 3 support attached raised power ascend transport- _Global positioning system.

2- Oral discussion :

What do you know about Global Positioning System (GPS) devices? In pairs, describe their main function, and give some examples of different applications of GPS devices.

Proposed Answer : « Tugs (powerful boats used for pulling ships) could be used as an external power source. However, the base station could be driven by its own propellers. The large, powerful engines needed to propel it would be heavy, but that isn't necessarily a disadvantage, as extra mass, and therefore extra inertia, would help to make the base more stable ».

Task One Complete the following extract from the user's manual of a GPS device using the verbs in Exercise 4a. Sometimes, more than one answer is possible.

The core function of your GPS receiver is to (1)..... you to locate your precise geographical position. To (2)..... - the device to function, it receives at least three signals simultaneously from the GPS constellation - 30 dedicated satellites which (3)- receivers can function anywhere on earth. To..... (4) - extremely precise positioning and (5)..... errors from occurring due to external factors, this device is designed to receive four separate signals.

Task Two / Complete the following extracts from the conversation by underlining the correct words.

- 1 ... there's a setting on the CPS that allows/prevents it to detect the movement...
- 2 ... an alarm sounds to warn you, and allows/prevents the boat from drifting unnoticed.
- 3 ... and enables/ensures that you don't lose track of where you were, which then enables/ensures you to turn round and come back to the same point.

Task Three : Match the GPS applications (1-6) to the descriptions (a-f).

- | | |
|---------------------------|---|
| 1 topographical surveying | a navigation and safety at sea |
| 2 geological exploration | b setting out positions and levels of new structures |
| 3 civil engineering | c mapping surface features |
| 4 avionics equipment | d applications in mining and the oil industry |
| 5 maritime applications | e highway navigation and vehicle tracking |
| 6 GPS in cars and trucks | f air traffic control, navigation and autopilot systems |

Answer Key

- Task 1** allow/enable allow/enable ensure allow/enable prevent
- Task 2** allows prevents ensures enables
- Task 3** 1/c 2/d 3/b 4/f 5/a 6/e

5- Communication/Dialogues

Example One : Job Interview Dialogues In English 1: Engineer

Mr. A: Welcome to our engineering company.

Mr. B: I am glad for the chance to be interviewed.

Mr. A: What specific job are you applying for?

Mr. B: I am an electrical engineer (double E) and I would like to try to get the job you advertised on the Net last week.

Mr. A: I see from your resume that you are very experienced.

Mr. B: Yes I've worked as an electrical engineer for 10 years now. But I think it is a good career move to join your company.

Mr. A: Why did you leave your former company?

Mr. B: It was a dead end job.

Mr. A: Yes our company is large and there is plenty of room for advancement.

Mr. B: So you'll give me the job?

Mr. A: Yes, but for the first month you will be on probation with half-pay. After that you will be a full employee of the company. Any questions?

Mr. B: What is the salary?

Mr. A: 50 k per year

Mr. B: Sounds good. When do I start?

Mr. A: Report to the engineering dept. on Monday at 9 am.

Mr. B: Great, thank you.

Mr. A: I look forward to working with you.

Example Two Candidate (Raj Kiran) and Interviewer (CEO)

candidate : Good morning Sir.

Mr : Good morning. Please sit down, Mr. Raj Kiran. Well! I am Kishan Sharma The CEO of this company.

candidate : So glad to meet you Sir.

Mr : Good to meet you too. Your CV is very impressive. You have done well in your academics .

candidate : Thank you very much Sir.

Mr : Well! Bright students like you generally proceed to foreign universities for higher studies. How come you didn't opt for it?

candidate : First of all, my parents couldn't afford it. Secondly, I didn't want to as I believe american institutions offer quality education and it depends on the students to make the best use of it.

Mr : Well! You have done B.E. in Computer Engineering and have proceeded to do MBA and specialised in marketing instead of doing Masters in the same under graduation subject. Is there any particular reason for it?

candidate : Well! I felt a technical degree along with Master in marketing would help me move upwards in my career.

MR : That is good thinking! Certainly that's why you are here for this interview. We are looking for fresher with such an educational combination to take on as trainees.

candidate : Thank you very much Sir. Well! May I know how long the training will be?

MR : Training will be for six months. Initially it will be held in Mumbai. Later, trainees will be shifted to the regional offices for on-the-job training for another six months. Afterwards they will be placed in anyone of the regional offices.

candidate : Is there any exam to be passed at the end of the training sir?

Mr: No. No exam as such. But you will be assessed for your performance through the entire training period.

candidate : Sir, when will I get to know the result of this interview?

MR : Say, within two weeks. You see, we have scheduled a number of interviews for this week. You have a bright chance Mr. Raj Kiran. Best of luck!

candidate : Thank you very much Sir. You're very kind.

Mr: You're welcome!

Example Three : Job interview conversation

Mr: Good Morning, John.

John: Good Morning sir .

Mr: How are you doing?

John: I am doing fine. Thank you.

Mr: That is good. John, let's start the interview. Are you ready?

John: Yes, I am.

Mr: First of all, let me properly introduce myself. I am the Finance Department Manager. As you know there is an open position in my department, and I need to fill this position as soon as possible.

John: Please, tell me a little bit about the position.

Mr: It is an entry-level position. The new employee will have to work closely with the Accounting department. He will also have to deal with the bank on a daily basis.

John: What type of qualifications do you require?

Mr: I require a four-year college degree in Finance. Some working experience would be helpful.

John: What kind of experience are you looking for?

Mr: Doing office work is good. However, since this is an entry-level position, I do not require a lot of experience. I am willing to train the new person.

John: That is great!

Mr: John, tell me a little bit about yourself.

John: I was a student at West Coast University, and I just graduated with a Bachelor degree in Finance. I have been working part-time as a payroll clerk for the last two years.

Mr: What are you looking for in a job?

John: The job should help me see what Finance is all about. I have learned a lot of Finance theories at school, and now it is time for me to put them into practice.

Mr: Anything else?

John: I also hope that it will help me grow in my field.

Mr: What are your strengths? Why should I hire you?

John: I am a hard-working person and a fast learner. I am very eager to learn, and I get along fine with people.

Mr: OK. Now, let me ask you a few quick questions. You do not mind working long hours, do you?

John: No, I do not.

Mr: Can you handle pressure?

John: Yes, I can. When I was going to school, I took quite a few courses each semester while working at least twenty hours every week. And, I handled that situation very well.

Mr: Do you still have any questions for me?

John: No, I think I have a pretty good understanding of the job. I believe that I can handle it with ease, and I hope to have the opportunity to work for you.

Mr: John, nice meeting you. Thank you for coming.

John: Nice meeting you too. Thank you for seeing me.

Unit Two

Materials Technology

1- Describing Specific Materials

Task One: In pairs, discuss the benefits and problems of recycling. Use the following examples and your own ideas.
Breaking up ships/ demolishing buildings/ recycling electronics/ scrapping cars

Task Two : complete the following sentences using the words in the box

Aluminium- Copper- Glass- Plastic- Rubber – Steel- Timber

RECYCLABLE MATERIALS :

- 1-..... Scrap can be sorted easily using magnetism. If the metal is galvanised(coated with zinc) the zinc is fully recyclable. It is stainless steel, other metals mixed with the iron , such as chromium and nickel, can also be recovered and recycled.
- 2-sorting is critical , as there are key differences between the clear and coloured material used in bottles and jars, and the high grade material used in engineering applications, which contains traces of metals.
- 3-.....-scarcity makes recycling especially desirable, and justifies the cost of removing insulation from electric wires, which are a major source of scrap. Pure metal can also be recovered from alloys derived from it, notably brass which also contains quantities of zinc.
- 4-.....the cost of melting down existing metal is significantly cheaper than the energy-intensive process of electrolysis, which is required to extract new metal from ore.
- 5-.....hardwood and softwood can be reused. However, the frequent need to remove ironmongery and saw off plane off damaged edges, can make the process costly.
- 6-.....there are the primary source of recyclable material, these can be reused whole in certain applications. They can also be ground into crumbs which have varied uses.
- 7-.....an obstacle to recycling is the need to sort waste carefully, while some types can be melted down for reuse, many cannot, or result in low-grade material.

Task Three : Match the materials from the web page (1-8) in Exercise 2 to the definitions (a-h).

- | | |
|-------------------|---|
| 1-Stainless steel | a-a metal used to make brass, and in galvanised coatings on steel |
| 2-Zinc | b- the predominant metal in steel |
| 3-Iron | c- a type of steel not needing a protective coating, as it doesn't rust |
| 4-Bronze | d-a dense poisonous metal |
| 5-Lead | e-rocks from which metals can be extracted |
| 6-Hardwood | f-an alloy made from copper and tin |
| 7-Ore | g-timber from pine trees |
| 8-Softwood | h-timber from deciduous trees |

Task Four : Complete the following sentences using from, with or of.

- 1 Bronze contains significant amounts *of* copper.
- 2 Galvanised steel is steel coatedzinc.
- 3 Steel is an alloy derived..... iron.
- 4 Pure metals can usually be recovered-.....alloys.
- 5 To produce stainless steel, iron is mixedother metals.
- 6 Stainless steel contains quantitieschromium and nickel.
- 7 Glass tableware contains traces -.....metals, such as lead.
- 8 When new metal is extractedore, the costs can be high.

Key Answers :

Task One : group discussion

Task Two : steel- glass- copper- aluminium- timber- rubber- plastic

Task Three : 1c- 2 a- 3b- 4f- 5d- 6h- 7 e- 8g

Task Four : of- with- from- from- with- of- of- from

2- Categorising Materials

Green Brakes

As motor racing goes green, formula 1 is aiming to lead automotive research in finding hi-tech efficiency gains. One of the keys to this ecological drive is regenerative braking (also known as kinetic energy recovery), which recovers energy generated during deceleration, and stores it as a source of power for subsequent acceleration.

Regenerative brakes limit the energy loss inherent in traditional braking systems. In most vehicles, conventional brakes comprise pads previously made from asbestos-based composites, but now consisting of compounds of exotic, non-hazardous materials, and discs made of ferrous metal. The resulting friction generates heat, which is wasted. In performance cars, this phenomenon is taken to extremes, and due to the high temperatures generated, brake discs are often made out of ceramics.

The carbon discs and pads used on formula 1 cars generate so much heat that they glow red hot high temperatures are, in fact, necessary for the effective operation of carbon brakes. But there's still plenty of potential for recovering the kinetic energy, rather than merely dissipating it in the form of heat.

The potential for recovering energy also extends to the heat generated by engines and exhaust systems. This area has also been discussed as a possible area for future exploitation in motor racing. Heat recovery might offer the added benefit of reducing heat soak (thermal absorption by the chassis) as delicate alloy parts and sensitive non-metallic materials, such as polymers, are susceptible to heat damage.



Task One : Answer the following questions

- 1-Why do most braking systems waste energy ?
- 2-What are regenerative braking systems, and how do they save energy ?
- 3-What characteristics are required of materials used for the brakes on racing cars ?
- 4-What is meant by heat soak, and why is it a problem in racing cars ?

Task Two : Match the materials from the text (1-7) to the descriptions (a-g).

- | | |
|----------------|---------------------------------|
| 1-Compounds | a- materials that are not metal |
| 2-Exotic | b- iron and steel |
| 3-Ferrous | c- combinations of materials |
| 4-Ceramics | d- mixture of metals |
| 5-Alloy | e- plastic materials |
| 6-Non-metallic | f- minerals transformed by heat |
| 7-polymers | g-rare or complex |

Task Three Oral discussion

In pairs, take turns to describe an object using the words from Exercise 5c and the phrases in the box.

Comprise	consist of	made from	made of	made out of
----------	------------	-----------	---------	-------------

Key Answers

Task One :

- 1- Because they use friction, which wastes energy as heat.
- 2- They recover heat and use it to power the car.
- 3- The ability to generate high levels of friction, and to resist the effects of friction and consequent heat.
- 4- Heat from the engine being absorbed by the chassis, which can damage sensitive parts such as electronic components and plastic parts.

Task Two : 1c- 2g- 3b- 4f- 5d- 6a- 7 e

Task Three : speaking/ oral discussion

3- Specifying and Describing Properties

What is KEVLAR ® ?

Dupont TM KEVLAR ® is an organic fiber in the aromatic polyamide family. The unique properties and distinct chemical composition of KEVLAR ® distinguish it from other commercial, man-made fibers.

KEVLAR ® has a unique combination of high modulus, toughness, abrasion resistance, and thermal stability. It was developed for demanding industrial and advanced-technology applications. Currently, many types of KEVLAR ® are produced to meet a broad range of end uses that require strong, lightweight, durable materials.

Task One : Find words in the text to match the following definitions.

1 *thoughtness* : the opposite of fragility

2 - : resistance to damage caused by friction

3-: resistance to problems caused by temperature change

4 -: long-lasting

5 - : the opposite of heavy

Task Two : Match the automotive parts (1 -5) to the descriptions (a-e).

- | | |
|----------------------------|---|
| 1-Drive belts | a sheets inserted between parts to prevent gas or fluid leakage |
| 2 brake pads | b pneumatic envelopes in contact with the road surface |
| 3 tyres | c flexible bands used in transmission systems |
| 4 sealing gaskets | d protective barriers capable of resisting gunshots |
| 5 bullet-resistant- armour | e pads pressed against discs to induce deceleration |

Task Three :

Car and truckhave incorporated KEVLAR ® into their construction because it offers superb puncture, abrasion and tear resistance.

The high modulus and abrasion resistance of KEVLAR ® help..... retain their original shape and tension over the millions of revolutions they go through over the lifespan of a vehicle.

The frictional forces that.....are designed to endure take less of a toll on those made with KEVLAR ®pulp. The enhanced thermal stability and inherent abrasion resistance of KEVLAR ®allow them to last long and stop the vehicle safety and quietly .

KEVLAR ® provides an effective, lightweight.....solution for vehicles that require protection against ballistic attack, allowing cars and trucks to retain most of their original handling characteristics.

Chemical stability and thermal stability help make.....reinforced with KEVLAR ® pulp strong and durable. The galvanic corrosion resistance of KEVLAR ®also contributes to improve long-term engine performance.

Task Four : Match the words and phrases (| -5) to the synonyms (a-e).

- | | |
|----------------------------|-----------------------------|
| 1- ideally | a-it is clear that |
| 2 -obviously | b-for the best result |
| 3- the last thing you want | c-the most important factor |
| 4- the key requirement | d-a lot of/ a high level of |
| 5- a good degree of | e-the worst situation |

Answer key

Task One : toughness- abrasion resistance- thermal stability- durable- lightweight

Task Two : 1c- 2 e- 3b- 4a- 5d

Task Three : Car and truck**tyres**.....have incorporated KEVLAR ® into their construction because it offers superb puncture, abrasion and tear resistance.

The high modulus and abrasion resistance of KEVLAR ®help.....**drive belts**..... retain their original shape and tension over the millions of revolutions they go through over the lifespan of a vehicle.

The frictional forces that.....**brakes pads**.....are designed to endure take less of a toll on those made with KEVLAR ®pulp. The enhanced thermal stability and inherent abrasion resistance of KEVLAR ®allow them to last long and stop the vehicle safety and quietly . KEVLAR ® provides an effective, lightweight.....**bullet resistant armour**.....solution for vehicles that require protection against ballistic attack, allowing cars and trucks to retain most of their original handling characteristics.

Chemical stability and thermal stability help make.....**sealing gasket**.....reinforced with KEVLAR ® pulp strong and durable. The galvanic corrosion resistance of KEVLAR ®also contributes to improve long-term engine performance.

4- Discussing Quality Issues

1-In pairs, answer the following questions :

- 1- In advertising, what hi-tech, high performance situations are often used to promote watches ?
- 2- What messages are they intended to send about the quality of products ?
- 3- What quality issues differentiate higher-quality watches from lower-quality one ?
- 4- What is the difference between describing something as water-resistant and waterproof ?

Key Answer :

- 1- Examples of situations used in advertising include motor racing, waters ports such as surfing and diving, and aviation.
- 2- The intended message is that watches are accurate and are resistant.
- 3- Higher quality watches keep good time; are resistant to water and shocks; and are made from more expensive better-looking materials.
- 4- Describing something as water-resistant suggests it can resist water up to a certain limit, for example to a certain depth or pressure Describing something as waterproof suggests it gives unlimited protection from water.

2-Listening comprehension

Task One : Louisa, a marketing executive for a watch manufacturer, is discussing material selection with Tom, one of her engineering colleagues. Listen to the discussion and complete the four quality issues that are mentioned in the meeting.

- 1-.....resistance
- 2-.....resistance
- 3-.....resistance
- 4-.....resistance

Task Two : Listen again and answer the following questions :

I What point does Tom make about the reasons for selecting materials?

- 2 What does he say about submarine-grade steel to exemplify the above point?
- 3 What problem does she describe with regard to the marketability of many materials?
- 4 What hard commercial facts does Louisa give ?

Task Three : In pairs, mark the following statements True (T) or False (F) according to the views expressed in the conversation.

- 1- Often, exotic-sounding materials are not that suitable, technically
- 2- People think that a submarine steel watch must be tremendously water-resistant
- 3- The corrosion resistance of submarine steel is exceptionally good
- 4- Submarine-grade steel looks fairly good
- 5- Tom thinks submarine steel is particularly suitable for watches
- 6- The firm has often used materials that are not adequately durable
- 7- Often, the compositions of good watch materials are relatively complex
- 8- Materials with complicated names are pretty good for marketing.

Task Four : complete the following table using the words in the box

Exceptionally fairly insufficiently not adequately not all that not
 particularly pretty relatively tremendously

Extremely	Quite	Not very	Not enough	Definitely not

5- Oral Presentation

In small groups, choose a well-known consumer product or appliance and discuss it from a quality perspective. How suitable are the materials used? How good is the product, compared with others sold by competitors.

Key answer

Task One :

Corrosion resistance

Water resistance

Scratch resistance

Shock resistance

Task Two :

1 Watch materials are sometimes chosen for marketing reasons, not technical reasons.

2 They consider reducing submarine-grade steel in some models even though water resistance actually depends on the joints and seals, not the metal used.

3 Many good watch-making materials are either ordinary or complex, and so are not very marketable.

4 Consumers are not technical experts, and make choices based on their impressions rather than on factual information.

Task Three :

- 1- Often, exotic-sounding materials are not that suitable, technically **T**
- 2- People think that a submarine steel watch must be tremendously water-resistant **T**
- 3- The corrosion resistance of submarine steel is exceptionally good **F** (it needs a protective coating)
- 4- Submarine-grade steel looks fairly good **F** (it 's fairly poor in terms of looks)
- 5- Tom thinks submarine steel is particularly suitable for watches **F** (no)
- 6- The firm has often used materials that are not adequately durable **F** (inadequate materials have never been chosen for marketing reasons)

7- Often, the compositions of good watch materials are relatively complex **T**
 Materials with complicated names are pretty good for marketing **F** (complicated names are not good for marketing)

Task Four : complete the following table using the words in the box

Extremely	Quite	Not very	Not enough	Definitely not
Exeptionally tremendously	fairly pretty relatively	not all that not particularly	Insufficiently not adequatly	Not at all

Unit Three

Technical English

1- Production Management

Production management is concerned with planning and controlling industrial processes which produce and distribute products and services. Techniques of production management are also used in service industries : here they are called operations management. During production processes, inputs are converted into outputs. These processes take many forms : from basic agriculture to large-scale manufacturing. Much manufacturing takes place in factories, where assembly line allow a steady flow of raw materials (inputs) and finished products (outputs).

Production varies according to the inputs, processes and outputs. Other important factors are the place of production and the resources. In addition, stock, a major cost, needs to be carefully controlled, and the equipments must be regularly maintained to remain productive and prevent breakdowns.

Task One answer the questions from the text :

- 1- What is a production management
- 2- What is the role of production process
- 3- What are the most important factors for a good production

Task Two : put the following words in their right place :

Maintain/equipments/machinery/factory/unit/store/raw materials/optimize/convert

Production place	Process	Resources	Stock	Maintenance
.....	assemble	.....	inventory	.....
plant	maximize	.....		repaire
Site	.....	Materials handling	.....	.....
.....	batch	.....	
workshop				

Task Three : here is a message written by a company director to the production manager . complete it with words from the list :

Faulty-equipment-repair-site-workshops-factory-stock-breakdowns-layout-maintain-fixtures-machinery.

We are making good progress with the new.....development. A newclose to the river has been acquired. Designers are currently working on the.....of the area and exact location of the factory building. Alland fittings will be carried by Alan Shores. The new manufacturing.....has been orderedand we hope to be able to install it ahead of shedule. Newwill be purshased for the engineeringonce they have been completed.

The present machinery is old and several.....recently have caused production .backlogs. we will continue to.....and.....these machines until the new ones are upand running.

I would ask you to carry out a full.....inventory as soon as possible. Anygoods should be removed from store and disposed of.

Task Four : Match the words that go together and then complete the sentences below :

Quality	material
Finished	manager
Industrial	lines
Production	process
large-scale	levels
Assembly	controls
Raw	products
Productivity	manufacturing

- 1-Improved.....has led to higher efficiency in production.
- 2 the manufacture of pape ris an.....
- 3 -Crude oil is the basicfor the plastics industry.
- 4 -Increasedhave reduced the number of manufacturing workers.

- 5 -The large warehouse is used to store..... waiting for delivery.
- 6 -Large car manufacturers use..... in production.
- 7- The company began in a single room but has now developed into.....
- 8- The manufacturing process is the responsibility of the.....

Task Five : Complete the sentences below. The first letter of the missing word has been given.

- 1 A quantity of goods prepared at the same time is known as a
- 2 To put parts together to produce the final product is to a
- 3 Production processes convert inputs to
- 4 The process of buying inputs is known as
- 5 A part which is used in the final product is called a
- 6 To get the best possible level of production is to

Key answer :

Task one

- 1- is concerned with planning and controlling industrial processes which produce and distribute products and services.
- 2- Raw materials are transformed to finished products

Task Two

Production place	Process	Resources	Stock	Maintenance
Factory	assemble	equipments	inventory	maintain
plant	maximize	Machinery	store	repaire
Site	optimize	Materials handling		
unit	batch	Raw materials		
workshop	convert			

Task Three :

We are making good progress with the new.....**factory**.....development. A new**site**.....close to the river has been acquired. Designers are currently working on the.....**layout**.....of the area and exact location of the factory building. All**fixtures**.....and fittings will be carried by Alan Shores. The new manufacturing.....**equipment**.....has been orderedand we hope to be able to install it ahead of shedule. New ... **machinery**will be purshased for the engineering workshopsonce they have been completed.

The present machinery is old and several.....**breakdowns**.....recently have caused production .backlogs. We will continue to.....**maintain**....and.....**repair**.....these machines until the new ones are upand running.

I would ask you to carry out a full.....**stock**.....inventory as soon as possible. Any**faulty**.....goods should be removed from store and disposed of.

3- Production Planning

A production planning system is essential to ensure that a company's processes, machinery, equipment, labour skills and material are organized efficiently for better profitability. There are many factors that need to be considered in the planning system. For example, a firm may require a large number of different components. Also demand can vary daily in this ever-changing world. New sales orders come in. Some get cancelled; there may be breakdowns in the workshop; backlogs build up; there may be late or early delivery from suppliers. It is difficult to keep track of all these changes manually. To handle these situations, many companies keep safety stock.

However, if a company has an effective production planning system there is no need to keep high safety stock. The money blocked in the excessive safety stock can be released. At the same time, opportunity costs due to stock-outs can be minimized.

All areas of management require careful *planning* and *organizing*. Planning and organizing production is essential for efficient operations.

Study the *Market Needs Analysis Model* below:

There are two principal aims of the *Market Needs Analysis Model* below:

- 1- To identify market needs for your product
- 2- To analyse the market potential for new products or services

The product performance specifications detail the operational features of the product.

At the product design stage, designers and product managers will redefine how the product is to work and how it is to be made.

At the production system specifications stage, we focus on the manufacturing requirements. Investment decision methods focus on the alternative methods for financing the investment needed. The objective of production system design is to standardize both the methods of production system design and the machine units for production system construction. A production cost model calculates production costs and capacity factors.

Task One : Choose the correct answer in the following.

1 Recent faults with machines have cost the company a great deal of -'

a) maintenance b) slack time c) downtime

2 Once the mock-up of the new design has been tested, we can build the -'

a) prototype b) update c) set up

3 It's unprofitable to manufacture small quantities because of the machine_.

a) lead time b) set-up time c) sequence

4 The production manager has to produce a production - for the next four weeks.

a) set up b) schedule c) output

5 Once the order has been agreed and production begun, the designer is still responsible for the.

a) work in progress b) workload c) back order

6 These items are produced together as one -'

a) cycle b) delivery c) lot

Task Two : Match the correct word with each definition.

Workload	the movement of materials through a production system
Workforce	an order from an earlier time which hasn't been produced yet
Backorder	the volume of goods which are produced
Material flow	something that is needed for a particular process
Throughput	the series of activities following one another to produce a product
Output	the amount of work that has to be done
Cycle	the volume of goods that can be dealt with in a certain period of time
Requirement	all the people who work in a particular company

Task Three : The works manager is showing a group around the factory. Complete the dialogue with the missing words

We're not particularly busy at the moment. Believe it or not, the
 (a).....
 for furniture is seasonal. So, do you (b)? Well, all our units are
 made- (c)stock.
 However, we make components-to- When are your busy times?
 Normally from September to May but there is always a great deal of (d)
 and it's difficult to (e) sales trends.
 So does the vary?
 No, not really. Our (g)..... is usually 8 to 10 weeks. When we are
 Very busy, the workforce usually do (h)to try to avoid a
 (i) of orders. It necessary we introduce a U
 system when we're working at full capacity to avoid (k)
 at key machines.
 During a busy period do you have (l)?
 Seldom. We use the time when work is (m) to build up stock of
 components. We don't like machines or workers to be (n)!

Key answer

Task One : 1c- 2a- 3b- 4b- 5a- 6c

Task Two :

Workload	the amount of work that has to be done
Workforce	all the people who work in a particular company
Back order	an order from an earlier time which hasn't been produced yet
Material flow	the movement of materials through a production system
Throughput	the volume of goods that can be dealt within a certain period of time
Output cycle	the volume of goods which are produced the series of activities following one another to produce a product
Requirements	something that is needed for a particular process

Task Three :

We're not particularly busy at the moment. Believe it or not, the
 (a).....**demand**.....for furniture is seasonal. So, do you (b) ...**make to stock**.....?
 Well, all our units are made- (c)**to-order**stock.
 However, we make components-to- When are your busy times?
 Normally from September to May but there is always a great deal of (d)
**uncertainty**..... and it's difficult to (e)**forecast**..... sales trends.
 So does the**lead time**vary?
 No, not really. Our (g).....**lead time**.....is usually 8 to 10 weeks. When we are

Very busy, the workforce usually do (h)**overtime**.....to try to avoid a(i)...backlog... of orders. It necessary we introduce a U)...**shift**.... system when we're working at full capacity to avoid (k)**bottlenecks**..... at key machines. During a busy period do you have (l)**stock out**.....? Seldom. We use the time when work is (m)**stock**.... to build up stock of components. We don't like machines or workers to be (n)**idle**...!

3- Research and Development

Research and development (R and D) is the search for new and improved products and industrial processes. Both industrial firms and governments carry out Rand D. Innovations in products or processes normally follow a path from laboratory (lab) idea, through pilot or prototype production and manufacturing start-up, to full-scale production and market introduction. There are two main types of research. Pure or basic research aims to clarify scientific principles without a specific end product in view; applied research uses the findings of pure research in order to achieve a particular commercial objective. Development describes the improvement of a product or process by scientists in conjunction with engineers. Industry spends vast sums to develop new products and the means to produce them cheaply, efficiently, and safely.

Research is important in many disciplines and there are different *types of research* with different *research professionals*. The type of research reflects the environment and the objectives. In addition, many research words have entered the general language.

Some useful vocabulary

Type of Research
Academic research- applied research- clinical research- development and evaluation research- experimental development- pure reserach- product development- strategic basic research

Research professionals
Analyst- engineer- lab technician- research assistant- scientist- technician

General terms
Breakthrough – carry out- feasible- pilot- prototype- patent- file-

Task One : Match the term with the correct definition.

Applied research	the study of pure scientific principles
Clinical research	the study of the parts and their relationship to one another
Pilot study	changing and improving a product to achieve the best result
Experimentation	looking at how scientific theory can be used in practice
Pure basic research	looking at the effects of drugs or treatment on patients
Product development	a new technique or idea
Innovation	the process of tests and trials (under different conditions)
Analysis	small scale experiment

Task Two : The following email has been received by the Rand D department. Complete it using words from the list.

Breakthrough- prototype- developmental- engineers- design- patent- innovative- experiment

Dear Frank

I had a preliminary meeting with Maria Altefors regardingher (a)..... for a new children's pushchair. It's a simple but..... (b) invention which will allow two children of different ages to be transported in a single unit. She has already registered a(c) and I'd like us to develop a (d) . Could you arrange a meeting with the..... (e) to discuss this? We will have to carry out(f) tests to assess safety features and(g) different weightloads, This could bea real(h) in pushair design

Regards

Ruth

Task Three : Use the word in brackets to form a word which fits in the sentence.

- 1 The scientists have presented a detailed..... of the results. (analyse)
- 2 They have brought in a foodto help in the research. (analyse)
- 3 All proce(innovate)
ss materials are tested using highly developed..... techniques. (analyse)
- 4 The researchers have come up with anidea for the use of recycled plastics.

- 5 Charles Dyson is the..... of a vacuum cleaner which works on a new principle (invent)
- 6 The advent of the ballpoint pen was a wonderful.....(invent)
- 7 They employ a large team of software.....(develop)
- 8 A report has been prepared on the..... tests that have been carried out. (develop)
- 9 Increasing numbers of people can now work from home thanks to..... in telecommunications. (develop)
- 10 These methods of production are still at..... an stage. (experiment)
- 11 The..... is continuing work on the new drug. (experiment)
- 12 Many people are against animal (experiment)

Task Four : classify the following words in the right column

Analyst/ lab technician/engineer/applied research/research assistant/scientist/academic research/clinical research/technician/ experimentation innovation/product development/strategic basic research /

Types of research	Research professionals

Key Answer

Task One :

Applied research	looking at how scientific theory can be used in practice
Clinical research	looking at the effects of drugs or treatment on patients
Pilot study	small-scale experiment
Experimentation	the process of tests and trials to see what happens under different conditions
Pure basic research	the study of pure scientific principles
Product development	changing and improving a product to achieve the best possible result
Innovation	a new technique or idea
Analysis	the study of the parts and their relationship to one another

Task Two :

Dear Frank

I had a preliminary meeting with Maria Altefors regarding her (a)...**design**for a new children's pushchair. It's a simple but.....**innovative** (b) invention which will allow two children of different ages to be transported in a single unit. She has already registered a**patent**.....(c) and I'd like us to develop a prototype (d) . Could you arrange a meeting with the.....**engineers**.....(e) to discuss this? We will have to carry out**developmental**(f) tests to assess safety features and**experiment**.....(g) different weightloads, This could be a real**breakthrough**.....(h) in pushchair design.

Regards

Ruth

Task Three :

1 The scientists have presented a detailed...**analysis** of the results. (analyse)

2 They have brought in a food ...**analyst**.....to help in the research. (analyse)

3 All processes (innovate)

4 The materials are tested using highly developed...**analytical**..... techniques. (analyse)

4 The researchers have come up with an ...**innovative**.....idea for the use of recycled plastics.

5 Charles Dyson is the.....**inventor**.... of a vacuum cleaner which works on a new principle (invent)

6 The advent of the ballpoint pen was a wonderful...**invention**.....(invent)

7 They employ a large team of software...**developers**.... (develop)

8 A report has been prepared on the...**developmental**.. tests that have been carried out. (develop)

9 Increasing numbers of people can now work from home thanks to...developments.... in telecommunications. (develop)

10 These methods of production are still at.....**experimental** an stage. (experiment)

11 The.....experimenter.....is continuing work on the new drug. (experiment)

12 Many people are against animal**experimentation**..... (experiment)

Task Four :

Types of research	Research professionals
Experimental development Academic research Applied research Product development Experimentation innovation Strategic basic research	Analyst Technician Lab technician Research assistant Scientist Engineer

4- LOGISTICS

Before reading the text check the meaning of the Key Words in the dictionary.

Nouns: goods, flow, resources, consumer, consumption, user, product, producer, storage, retailer, inventory, warehouse, destination, re-engineering, customs, taxes, duties, logistician
Verbs: to consume, to handle, to include, to require, to comprise, to produce, to manufacture, to manage, to purchase, to sell, to implement, to perform, to ensure, to increase, to decrease, to pack

Logistics can be defined as the management of the flow of goods, information and other resources, energy and people between the point of origin and the point of consumption in order to meet the requirements of consumers. Logistics involves the integration of information, transportation, inventory, warehousing, materialhandling, packaging and security. Logistics may have an internal focus (inbound logistics), or external focus (outbound logistics).

If the company manufactures a product from parts purchased from suppliers, and those products are then sold to customers, one can speak about a *supply chain*. *Supply Chain* can be defined as a network of facilities and distribution options that performs the function of procurement of materials, transformation of these materials into intermediate and finished products, and the distribution of these finished products to customers.

Logistics management is part of supply chain management. Logistics management plans, implements, and controls the efficient flow and storage of goods, services and related information between the point of origin and the point of consumption in order to meet customers' requirements.

Successful supply chain operators work in close partnerships with their customers; they jointly explore the opportunities for increasing efficiency of the supply chain and improving service levels by using the latest systems and techniques. This approach is also referred to as *logistics re-engineering*. The re-engineering process considers the following factors: the nature of the product, the optimal or preferred location of source or manufacture, freight and transport costs and the destination market, seasonal trends, import and export regulations, customs duties and taxes, etc.

A professional working in the field of logistics management is called a *logistician*. The main functions of a qualified logistician include, among other things, inventory management, purchasing, transportation, warehousing, consultation and organizing and planning of these activities. Logisticians are responsible for the life cycle and supply chain operations of a variety of products. They are also responsible for customs documentation. They regularly work with other departments to ensure that the customers' needs and requirements are met.

UNDERSTANDING THE MAIN POINTS

TaskOne : answer the questions from the text

1. What does the term “logistics” imply?
2. What does the term “supply chain” imply?
3. What is logistics management?
4. What do service providers do in order to increase efficiency of the supply chain?
5. What process is called “logistics re-engineering”?
6. What factors does this process consider?
7. What are the main functions of a qualified logistician?
8. What are professional logisticians responsible for?

Task Two : Decide whether the following statements are true or false.

1. Logistics can be defined as the management of the flow of goods between the point of origin and the point of consumption.
2. Logistics involves the integration of information, transportation, inventory, warehousing, etc.
3. Usually, logistics does not involve the management of the flow of energy and people.
4. Logistics always has an external focus.
5. All supply chains are very simple.
6. The complexity of the supply chain will vary with the size of the business.
7. Logistics management is part of supply chain management.
8. Logistics management plans, implements, and controls the efficient flow and storage of goods, services and related information.
9. Successful supply chain operators work in close partnerships with their customers.
10. The re-engineering process does not consider the nature of the product.
11. A professional working in the field of logistics management is called an academician.
12. The main functions of a qualified logistician include, inventory management, purchasing, transportation, warehousing, etc.
13. Logisticians are responsible for the life cycle and supply chain operations of a variety of products.
14. Logisticians normally do not work with other departments of the company.

Task Three : Find a word or phrase which means:

- 1 a contract with a shipper to transport goods.
- 2 the control of flow of materials and goods within the factory.
- 3 to bring goods in from another country.
- 4 a place where large quantities of materials, equipment or goods are stored until they are needed.
- 5 goods packed together and wrapped up ready for transportation.
- 6 goods carried on a plane, ship or truck.
- 7 the system of distribution of goods from producer to customer.
- 8 in the process of being transported.
- 9 to put goods onto a ship, lorry or plane.
- 10 the act of moving goods from one place to another.

Task Four : Here is an email from Woodman Ud., a manufacturing company, to a customer. Fill in the blanks with words from the box

Dispatched- warehouse- shipped- delivery- carrier- packing list- crate- delivery note- consignment
--

Ref: MS423

Dear Clive

We have just (a)..... the (b)of goods, order n° MS423,to you. We have used our usual (c)..... , MJ Irving. The Chairs have been packed in a wooden (d)..... and marked WDMS Belfast. Iam attaeing the (e) ; the (f)..... is enclosed with the goods.

The erate should be (g)..... Ireland on Thursday and Irvinghas promised (h)to your (i)..... in Belfast on Fridaymorning.

Regards

Barry

Key Answer

Task Three :

a contract with a shipper to transport goods. **Bill of lading**

2 the control of flow of materials and goods within the factory. **Materials management**

3 to bring goods in from another country. **Import**

4 a place where large quantities of materials, equipment or goods are stored until they are needed. **Depot**

5 goods packed together and wrapped up ready for transportation. **Package**

6 goods carried on a plane, ship or truck. **Cargo**

7 the system of distribution of goods from producer to customer. **Channel**

8 in the process of being transported. **In transit**

9 to put goods onto a ship, lorry or plane. **Load**

10 the act of moving goods from one place to another. **Carriage**

Task Four :

Dear Clive

We have just (a).....**dispatched**..... the (b) ...**consignments**.....of goods, order n. MS423,to you. We have used our usual (c)...**carrier**..... MJ Irving.The ehairs have been paeked

in a wooden (d).....**crate**..... and marked WDMS Belfast. Iam attaching the the (f).....packing list, the delivery note..... is enclosed with the goods.

The erate should be (g)...**shipped**..... Ireland on Thursday and Irvinghas promised

(h)**delivery**.....to your (i).....**warehouse**... in Belfast on Friday morning.

Regards

Barry

5- Quality

Quality means meeting the minimum set of requirements in a product's specification and then being delighted that the customer's expectations have been met and exceeded. Therefore, the goal of a business should be to find out customer needs and then fine tune the process to ensure that they are met.

Quality improvement concepts have developed over several decades. They began simply as a method for detecting defective products by inspection at the end of the production line. In recent years the emphasis has changed from inspection to prevention. Today sampling methods monitor processes and keep them under control. The ultimate aim, of course, is zero defects.

In recent years different approaches to quality improvement have been developed. The overall aim is to prevent *defects* through:

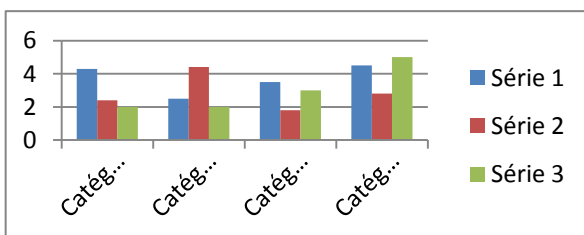
continuous process improvement

customer focus

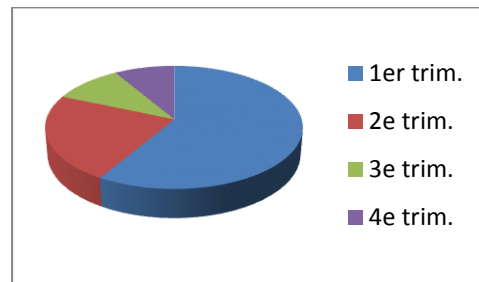
Below are three examples of useful quality summary charts:

A Pareto chart is a type of bar chart typically used to improve quality, process capability, or to conserve materials and energy.

A bar graph uses either horizontal or vertical bars to show comparisons among categories



A pie chart helps you to visualize the relative importance of several categories of a variable



Task One : Choose the correct word in the following sentences.

- 1 We must check/control the temperature regularly to make sure it doesn't rise.
- 2 To compare the number of defects over the last ten years, it would be best to use a Pareto/bar chart.
- 3 We try to detect/define faulty products before they are sent to our customers.
- 4 But it's a better idea to protect/prevent faulty products in the first place.
- 5 Making sure that materials are stored correctly is part of process/inventory control.
- 6 We're sending our engineer who will repair/remake the faulty motor.
- 7 We have had problems with the electronic equipment due to power errors/failures.
- 8 This process is very inefficient because of the volume of scrap/error left over.
- 9 Here is a list of things we could do to improve quality, and now we must define/prioritize them.
- 10 Improving the design quality of these cars will add value/variability.

Task Two : Choose the correct ending from B to complete each of the following sentences in A and then produce a short article about Japanese cars.

- 1 Let us consider what happened when Japanese cars as often as British or American cars.
- 2 Local manufacturers thought they were cheap which exceeded their expectations.
- 3 But soon people noticed that they didn't they provided value for money.
break down
- 4 At the same time, Japanese manufacturers were first imported into the UK and USA started trying to
- 5 Customers were delighted with the new cars and of low quality.
- 6 The cars did more than simply satisfy meet customer needs in terms of style/design

customers' requirements,

Task Three : Here is a memo from the head of quality control to the managing director. Complete it with words from the box

Improvement- sampling- defetcs- zero- prevent- analysis- monitor- continous- cause/effect- defective- pareto

From Sue Braun

To Alois Yicc;:nt

Re Quality control

.....
.....
As you know we recently carried out a (a)..... analysis of the bottle manufacturing plant.

Our aim was quality (b)..... and to reduce the number of (e)..... products.

As you can see from the attached (d) chart, raw materials and system failures are the areas we must improve on.

We will introduce new systems to change our (e)..... methods and (f)..... raw materials more carefully. We carried out a system failure (g)..... and we are now repairing.

the moulding machine. This will (h)..... future failures and reduce (i)..... .
With U)..... process improvement, our aim is (k)..... defects.

Key Answer

Task One :

1 We must **check**/control the temperature regularly to make sure it doesn't rise.

2 To compare the number of defects over the last ten years, it would be best to use a Pareto/**bar** chart.

3 We try to **detect**/define faulty products before they are sent to our customers.

4 But it's a better idea to protect/**prevent** faulty products in the first place.

5 Making sure that materials are stored correctly is part of process/**inventory** control.

6 We're sending our engineer who will **repair**/remake the faulty motor.

7 We have had problems with the electronic equipment due to power errors/**failures**.

8 This process is very inefficient because of the volume of **scrap**/error left over.

9 Here is a list of things we could do to improve quality, and now we must define/**prioritize** them.

10 Improving the design quality of these cars will add **value**/variability

Task Two :

Let us consider what happened when Japanese cars were first imported into the UK and America.

Local manufacturers thought they were cheap and of low quality.

But soon people noticed that they didn't break down as often as British or American cars.

At the same time, Japanese manufacturers started trying to meet customer needs in terms of style and design.

Customers were delighted with the new cars which exceeded their expectations.

The cars did more than simply satisfy customers' requirements, they provided value for money.

Task Three :

From Sue Braun

To Alois Yicc;:nt

Re Quality control

As you know we recently carried out a (a)...**cause/effect**..... analysis of the bottle manufacturing plant.

Our aim was quality (b)...**improvement**..... and to reduce the number of (c).....**defective**..... products.

As you can see from the attached (d)... **pareto**.... chart, raw materials and system failures are the areas we must improve on.

We will introduce new systems to change our (e)...**sampling**... methods and (f).....**monitor**..... raw materials more carefully. We carried out a system failure (g)...**analysis**.... and we are now repairing the moulding machine. This will (h)...**prevent**..... future failures and reduce (i)...**defects**... .

WithU).....**continous**... process improvement, our aim is (k).....**zero**..... defects.

6- **Information Technology**

Information systems collect, organize, store, process, retrieve and display information in different formats (text, video, and voice), Information technology allows very fast automated manipulation of digital data and their transformation from and to analogue.

Two basic technologies have been responsible for the development of the necessary hardware: integrated circuits and digital communications, Parallel advances have been made in software, particularly easy-to-use software products to create, maintain, manipulate, and query files and records. Many of these software programs are designed for use both by computer professionals and enthusiastic amateurs. Another important factor is the development of computer networks.

As technology develops, new *models* and *types* of computer appear. At the heart of all computers is the *hardware*. However, Without *software*. Computers are just dumb boxes, unable to perform any calculations or operations.

A network includes:

- ✓ Techniques
- ✓ physical connections
- ✓ computer programs

used to link two or more computers.

Network users can:

- ✓ share files, printers and other resources
- ✓ send electronic messages
- ✓ .run programs on other computers

Each network operates according to a set of computer programs called network protocols for computers to talk to one another. Computer networks can now be interconnected efficiently through gateways. The biggest network is the World Wide Web. It consists of a large number of smaller interconnected networks called internets. These internets may connect tens, hundreds, or thousands of computers. They can share information with each other, such as databases of information. The internet allows people all over the world to communicate with each other effectively and inexpensively.

Before a network can operate, it needs physical *connections* so that signals can be transmitted. After the network has been connecte d, it is ready for *operatíon*.

Models and types of computer

Desktop- laptop- mainframe- notebook- server- terminal- workstation

Computer Hardware

CPU- expansion card- inkject printer- keyboard- laser printer- monitor- mouse- scanner- screen

Computer Software

Operating system- database software- graphic software- search engine-word processing

Task One : label the diagram



Basic parts of a Computer

Task Two : combine A with B

<u>A</u>	<u>B</u>
Create	products
Central software	information
Display	processing unit
Digital	files
Expansion	network
Integrated	data
Computer	circuits

Task Two : Complete each gap in the following text with a phrase from the table above.

- 1 The computer monitor willso you can see it on screen.
- 2 Information is stored on a computer as.....
- 3 Spreadsheet and graphic software are examples of.....
- 4 Digital communications and..... have allowed developments in hardware to be made.
- 5 In order to organise data you should..... where you can store data.

6 When several computers are linked together you have a.....

7 The part of the computer which interprets and carries out instructions is the.....

An.....can be inserted in your computer to give your computer extra capabilities.

Task Three Choose the correct word in each of the following.

1 The speed with which a modem can process data is measured in -'

a) bandwidth b) bits per second (bps) c) signal

2 Cables consisting of several copper wires each with a shield are known as - cables.

a) twisted pair b) optical fibre c) power cables

3 Computers that are connected together within one building form a -'

a) WAN b) ISP c) LAN

4 If you transfer a file from a remote computer to your computer, you -'

a) download b) upload c) run

5 To send out information is to -'

a) signal b) packet c) transmit

6 A document containing information and graphics that can be accessed on the internet is

a) a website b) a web page c) the World Wide Web

task Four : Complete the words in the following sentences by adding the prefix *inter-*, *intra-*, *trans-*, *com-*, *con-*, *up-* or *down-*.

1 Last month computertime cost the company over €10,000 in lost production.

2 The computers in the production department have now been successfully.....connected with those in the planning department.

3 Once you have completed payment details the data will bemitted via a secure link.

4 We cannot network these computers because the systems are notpatible.

5 Many companies distribute internal documents on their ownnet.

6 Once the home page has been completed, we'll be ready toload the site.

7 Cables are being laid throughout the building as the network requires physical.....nections.

8 Using the network he was able tobine the data from different reports.

Key answer

Task one :- Speaker-Printer- Monitor- Screen- CPU- Speaker-Keybaord-Mouse

Task Two : creates files- central processing unit- software products- display information- digital data- expansion card- integrated circuits- computer network

Task Three : b- a- c- a- c- b

Task Four : down time- interconnected- transmitted- compatible- intranet- upload- connections-combine

1 Last month computer **.down.**time cost the company over €10,000 in lost production.

2 The computers in the production department have now been successfully...**interconnected** with those in the planning department.

3 Once you have completed payment details the data will be **.trans.**mitted via a secure link.

4 We cannot network these computers because the systems are not **...com**patible.

5 Many companies distribute internal documents on their own **.....intra.....net.**

6 Once the home page has been completed, we'll be ready to **.....up.....lo**ad the site.

7 Cables are being laid throughout the building as the network requires physical...**con.....nections.**

8 Using the network he was able to **.....com.....bine** the data from different reports.

Unit Four

Health and safety

A- The average person finds it difficult to assess risks. For this reason, work practices need to be regulated. Examples of dangerous activities are:

- ✓ Welding or grinding without goggles
- ✓ Working on a construction site work without a hard hat
- ✓ Working in noisy factories, cabs, on airport tarmacs and with outdoor machinery without ear protection
- ✓ Working in chemical areas without protective clothing
- ✓ Smoking near hazardous substances

Without regulation some employees will take risks.

Health and safety is a part of employment (labour) law. It covers general matters such as:

- ✓ occupational health
- ✓ accident prevention regulations
- ✓ special regulations for hazardous occupations such as mining and building
- ✓ provisions for risks such as poisons, dangerous machinery, dust, noise, vibration, and radiation
- ✓ the full range of dangers arising from modern industrial processes, for example the widespread use of chemicals.

B- The key concerns for health and safety are to assess the *risks and hazards* by identifying and quantifying the *effects* so that appropriate *protective measures* can be taken.

Risks and hazards

Combustion- contamination- drains-dust- explosion- flammable- friction- fumes- fumigation- gas- harmful- shock- spraying- toxic- vapour

Effects

Adverse effects- birth defects- burn- cancer-
dizziness- drowsiness- genetic damage- impair fertility-
irreversible effect- vomiting

Protective measure

Avoid contact with- dispose of – dry- handle- keep-
precautionary- protect- recycle- rinse- seal- tightly-
wash- well-ventilated

Task One : Choose the correct word in each sentence.

- 1 Store containers in a well-ventilated/good-ventilated place
- 2 Wipe up any spillages immediately and wash/rinse with soapy water.
- 3 Process cooling water can be returned/recycled.
- 4 This chemical is toxic/intoxicating if swallowed.
- 5 Leftover chemicals should be disproved/disposed of safely.
- 6 Please wear protective gloves when fingering/handling this material.
- 7 Remember that asbestos fibres can cause cancer/coma.
- 8 Pregnant women should not take this medicine as it may cause birth defects/effects.
- 9 Increased levels of radiation may lead to compared/impaired fertility.
- 10 Do not empty chemical paint products into the drains/grains.
- 11 Protect/ Avoid contact with skin and eyes.
- 12 Do not use with other products as it may release dangerous fumes/fumigation.

Task Two : Complete the following sentences with a form of the word in brackets.

- 1 When working in this area, please wear..... clothing (protect).
- 2 Don't pour used chemicals into the drains as they will cause.....(contaminate).
- 3 Heating this líquid may cause an..... (explode).
- 4 These chemicals must be kept in a locked cupboard because they are.....(harm)
- 5 While they repair the roof, we will close this department as a -.....measure (precaution).

- 6..... health is one part of Health and Safety (occupation).
 7 Working in a noisy factory without ear protectors is a.....activity (danger)
 8 Petrol and oil arechemicals (flame).
 9 Make sure the containers areclosed (tight).
 10 Make sure you are wearing breathing equipment before starting(fume).

Task Three : The manager in charge of health and safety is explaining things to some new employees. Complete what he says by filling the blanks with the correct word from the box.

Noise- protection- drowsiness- dust- accidents- smoke- poisonous- fumes- risks- burns- goggles

Manager : new government regulations mean that we are all required to be more aware of (a).....in the workplace. As your employer, we will provide you with the necessary safety equipment. You must wear (b).....to protect you eyes when working on this machinery. You should also wear (c).....because the (d).....from the machines is high enough to cause damage to your hearing. And of course, there is a lot of (e)in the air, so please wear a mask to stop you breathing it in. But, you too are responsible for your safety and for preventing (f).....happening.

Employee : are we looking at the fire risks ?

Manager : yes, of course. Remember that it is very dangerous to (g)near the chemical stores. In fact, we have a no smoking policy throughout the company. Chemicals themselves are, of course, (h).....so they should never enter your mouth. They could cause (i).....if you get them on your skin. If you leave them without a lid, (j).....may escape and cause headaches, (k).....or dizziness.

Key Answer :

Task One :

- 1 Store containers in a **well-ventilated**/good-ventilated place
- 2 Wipe up any spillages immediately and **wash**/rinse with soapy water.
- 3 Process cooling water can be returned/**recycled**.
- 4 This chemical is **toxic**/intoxicating if swallowed.
- 5 Leftover chemicals should be disposed/**disposed** of safely.
- 6 Please wear protective gloves when fingering/**handling** this material.
- 7 Remember that asbestos fibres can cause **cancer**/coma.
- 8 Pregnant women should not take this medicine as it may cause birth **defects**/effects.
- 9 Increased levels of radiation may lead to compared/**impaired** fertility.
- 10 Do not empty chemical paint products into the **drains**/grains.
- 11 Protect/ **Avoid** contact with skin and eyes.
- 12 Do not use with other products as it may release dangerous fumes/**fumigation**

Task Two :

- 1 When working in this area, please wear.....**protective**..... clothing (protect).
- 2 Don't pour used chemicals into the drains as they will cause...**contamination**..(Contaminate).
- 3 Heating this liquid may cause an.....**explosion**..... (Explode).
- 4 These chemicals must be kept in a locked cupboard because they are...**harmful**..(harm)
- 5 While they repair the roof, we will close this department as a -
...**precautionary**..measure (precaution).
- 6.....**Occupational**..... health is one part of Health and Safety (occupation).
- 7 Working in a noisy factory without ear protectors is a.....**dangerous**...activity
(danger)
- 8 Petrol and oil are**flammable**.....chemicals (flame).
- 9 Make sure the containers are ...**tightly**..closed (tight).
- 10 Make sure you are wearing breathing equipment before starting
...**fumigation**....(fume).

Task Three :

Manager : new government regulations mean that we are all required to be more aware of (a)...**risks**.....in the workplace. As your employer, we will provide you with the necessary safety equipment. You must wear (b).....**goggles**.....to protect you eyes when working on this machinery. You should also wear (c)...**protection**.....because the (d).....**noise**.....from the machines is high enough to cause damage to your hearing. And of course, there is a lot of (e) **dust**.....in the air, so please wear masks to stop you breathing it in. But, you too are responsible for your safety and for preventing (f).....**accidents**.....happening.

Employee : are we looking at the fire risks ?

Manager : yes, of course. Remember that it is very dangerous to (g) ...**smoke**.....near the chemical stores. In fact, we have a no smoking policy throughout the company. Chemicals themselves are, of course, (h)...**poisonous**.....so they should never enter your mouth. They could cause (i).....**burns**.....if you get them on your skin. If you leave them without a lid, (j)...**fumes**.....may escape and cause headaches, (k).....**drowsiness**....or dizziness.

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