SECTION 1

UNIT 1 Safety and health at work. Introduction

A. **1**l infortunio, **2**f multe, **3**g servizi sociali , **4**a abilità, **5**i sicurezza, **6**b microbiologia, **7**d fornitori, **8**e protezione, **9**c salute, **10**h ambiente.

B. **1** safety, **2** protection, **3** environment, **4** welfare, **5** health, **6** suppliers, **7** microbiology, **8** injury, **9** performance, **10** skills.

C. **1** It is mainly concerned with the prevention from hazards.
2 They may also involve entire communities.
3 They may cause also costs for social security programmes and loss of workers' skills.
4 They are also obliged to respect criminal law and moral standards.

UNIT 2 Categories of hazards

A.

Type of hazard	Types of risks						
	Slips	Trips	Falls	Health	Injury	Stress	Strain
Chemicals				x			
Poor body position							x
Bad lighting						x	
Wet floors	x				x		x
Bacteria and viruses				x			
Working at height			x		x		x
Repetitive movements					x	x	x
Uneven pavements			x		x		x
Lifting heavy objects				x			x
Obstacles in the way		x					
Sharp edged tools					x		

B. **1** hazards, **2** death, **3** workplace, **4** lives, **5** dusts, **6** illnesses, **7** recognizable, **8** bad, **9** infected, **10** psychological, **11** combination, **12** policy.

UNIT 3 Accidents at work – Key facts

A. **Accidents in the workplace:** all sectors of economy, agriculture and construction sectors.
Reasons: slips, trips, falls in all sectors; falling objects, thermal and chemical burns, fires, explosions, dangerous substances, stress, shift work, lack of experience, long hours.

Consequences: death and injury, suffering to workers and families, disruption in the production process, business and society costs.

B.

A	B	Collocations	Italian equivalent
1	f	worker protection	Protezione del lavoratore
2	a	risk assessment	Valutazione del rischio
3	g	health problems	Problemi di salute
4	e	accident rates	Tasso degli incidenti
5	d	shift work	Lavoro su turni
6	b	production process	Processo di produzione
7	c	insurance payouts	Versamenti assicurativi

C.

1 They cause suffering for workers and their families, they result in disruption in the production process, they cause costs for recruiting, training new staff, for early retirement and insurance pay-outs.

2 They are slips, trips and falls.

3 They are falling objects, thermal and chemical burns, fires, explosions, dangerous substances and stress.

4 Every five minutes somebody dies from work-related cause in the EU, men have more accidents than women, the construction and agriculture sector are among the most dangerous, night workers are at higher risk.

5 35% of them feel that their job poses health risks.

6 Young workers, old workers, migrant workers and workers whose jobs are only temporary.

7 The small and medium enterprises because they have fewer resources to adopt effective and complex systems of protection.

8 The construction, agriculture, fishing, transport, health care and social services sectors.

UNIT 4 Hazards and risks assesment

A. **1**b, **2**d, **3**h, **4**f, **5**n, **6**l, **7**e, **8**i, **9**g, **10**c, **11**m, **12**a.

B. **1** harm, **2** health, **3** handling, **4** acute, **5** assessed, **6** source, **7** to eliminate, **8** arise, **9** intervention, **10** measures, **11** change, **12** complex.

C.

1 A hazard is any source of potential harm (object, substance, situation) that can cause adverse effects on health, a risk is the chance, high or low, that any hazard will actually cause somebody harm.

2 For example the hazard of carrying heavy objects repetitively poses the risk of health problems such as musculoskeletal disorder; a wet floor is a hazard that poses the risk of slips and falls.

3 First identify the hazard, secondly evaluate and prioritize risks, then decide on preventive action, in the end take action.

4 They can be calculated and expressed mathematically on the base of the probability of the harm and the severity of its consequences. In this case the assessment is quantitative, but it can be also qualitative when it describes the circumstances in which the harm could arise.

5 Because technology, resources, social expectations or regulations change.

UNIT 5 Common jobs and associated hazards

A. **1** welders, **2** mechanics, **3** port workers, **4** textile workers, **5** tractor drivers, **6** agricultural workers, **7** office workers, **8** construction worker.

B.

Jobs	Hazard	Harm
Mechanics	Cuts, falls, lifting heavy weights, bending for long, chemicals (oils, solvents, fumes etc.).	**Injuries, musculoskeletal disorders, intoxication, skin irritation etc.**
Welders	**Sparks, fire, intense light, fumes given off.**	Burns, eye damage, lungs damage.
Port workers	Handling cargos, nature of cargos, language of warnings is not known.	Musculoskeletal disorders, injuries.
Office workers	**Chemical hazards (photocopiers), poor lighting, noise, poorly designed chairs.**	Stress, musculoskeletal disorders, eye damage.
Tractor drivers	**Vehicles overturning, noise, vibrations, chemical herbicides.**	Injuries, death, intoxication, hearing loss.
Agricultural workers	**Sprayed chemicals, pesticides and herbicides.**	**Intoxication, lung damage, skin irritation.**
Textile workers	Unguarded machines, fires, noise, vibrations, dust, combustible fires.	**Burns, lung damage, injuries.**
Construction workers	Falls, slips, trips, cuts, lifting heavy weights, working at height, noise.	Musculoskeletal disorders, injuries.

C. **1** warnings or information, **2** specific tasks, **3** fatal consequences, **4** serious health risks, **5** intense light, **6** office workers, **7** high number. Not necessary: falling objects

UNIT 6 Significant hazards and risks

A. **1** Inadequate work equipment, **2** Workplace safety, **3** Workplace transport, **4** Workforce education, **5** Working at height, **6** Burns, **7** Fires and explosions, **8** Dangerous substances, **9** Asphyxiation, **10** Psychosocial factors.

B.

	A	B
1	Hazards included in the risk assessment should be described in	relation to factors that may be different between the various working sectors.
2	Hazards may be caused by	lack of systems protecting from contact with dangerous items.
3	Lifting machines such as cranes should be	well visible while they are working.
4	Poor safety systems in moving and storing loads may cause the risk	of people being struck or run over by the moving machines.

5	In sectors where the use of chemical and corrosive substances is	required, the risk of serious burns may be more frequent.
6	The inhalation of carbon monoxide	owing to incomplete combustion can be a fatal "silent killer".
7	In very resctricted areas such as tanks or	vats workers may run the risk of asphyxiation due to the lack of oxygen.
8	In order to reduce the risk of dangerous falls one of the measures	to be taken by employers is to level uneven floor surfaces.

UNIT 7 Construction: a dangerous sector

A. **1**f excavation work, **2**i material handling, **3**g construction process, **4**j competent technician, **5**h potential hazards, **6**c safety equipment, **7**a waste substances, **8**b access system, **9**d workers' protection, **10**e supporting elements.

B. **1** excavation work, **2** workers protection, **3** safety equipment, **4** construction process, **5** potential hazards, **6** supporting elements, **7** material handling, **8** competent technician, **9** access system, **10** waste substances.

C. consequently, both … and, moreover, owing to, as a result of, in addition, such as, therefore.

D. **1** consequently, **2** owing to, **3** in order to, **4** as a result, **5** In addition, **6** both … and.

UNIT 8 EU Directive 89/391

A. **1** occupational/occupazionale, **2** protection/protezione, **3** risks/rischi, **4** except for/eccetto per, **5** series/serie, **6** ensure/assicurare, **7** basic/basilare, **8** replace/sostituire, **9** coheren/coerente, **10** elimination/eliminazione, **11** capabilities/capacità, **12** concerning/riguardante.

B. **1** concerning, **2** except for, **3** protection, **4** risks, **5** elimination, **6** series, **7** basic, **8** ensure, **9** replace, **10** coherent, **11** capabilities, **12** occupational.

UNIT 9 European Agency for Safety and Health at Work

A. **1** consultare, **2** promuovere, **3** contribuire, **4** affrontare, **5** valutare, misurare, **6** fornire, **7** assicurare, assicurarsi, **8** proteggere, **9** richiedere, **10** migliorare, **11** riuscire a.

B. **1** ensure, **2** provide, **3** protect, assess, **4** promote, protect, **5** face.

C. **Possible answers**

1 They are the new technology, shifting economic and social conditions, new work practices and production processes.

2 They bring with them new risks and challenges for workers and employers.
3 They can be reduced through political, administrative and technical approaches that ensure high levels of safety and health at work.
4 They should refer to the Directive 89/391 that provides the general framework for health and safety management, risk identification and prevention.
5 They should take measures to protect the safety and health of their workers, keep accident records, and provide information and training.

UNIT 10 A new EU strategy

A.

5	It refers to a five/year strategy for Safety and Health by the EU.
17%	It refers to the percentage of the reduction of accidents in the EU/15 / between 2002/2006 per 100.000 workers.
25%	It refers to the plans of the EU aiming at reducing accidents in the EU/27 by 25% per 100.000 workers.

B. **1**g, **2**j, **3**i, **4**d, **5**k, **6**c, **7**h, **8**e, **9**b, **10**f, **11**a.

C. **1** cut accidents, **2** achieve good results, **3** simplify the law, **4** provide qualitative information/promote health and safety/preventive action, **5** encourage behaviour changes , **6** collect data.

D. Free.

SECTION 1 Final test

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

B. **1** jobs pose a threat to their health, **2** assessment, **3** source, **4** welder, **5** injury, **6** prevention, **7** therefore, **8** harm, **9** environment.

C. **1** on the other hand, **2** such as, **3** as well as, **4** both/and/in addition, **5** in spite of, **6** except for, **7** hazard, **8** as a result.

D. **1** A hazard is anything that can cause harm; a risk is the chance of harm to be caused; harm is a negative safety and health consequence.
2 Because some categories such as young workers or workers whose jobs are insecure are still at high risk. Besides SMEs, are more exposed because they have fewer resources to adopt preventive programmes.
3 It involves a quantitative and qualitative assessment, that is the mathematical calculation of the risk factor and the description of the circumstances where the harm may arise.
4 It is to make workplaces safer, healthier and more productive, by promoting a culture of risk prevention.

SECTION 2

UNIT 11 Chemical hazards

A. **1** pesticide, **2** contamination, **3** disposal, **4** food additive, **5** banned, **6** hazardous, **7** toxic, **8** developing.

B. **1** hazardous/toxic, **2** additives, **3** developed, **4** disposal, **5** banned, **6** contamination, **7** pesticides, **8** toxic/hazardous.

C.
1 They are agricultural chemicals, food additives, pharmaceuticals, fuels for power production, chemical consumer products, etc.
2 It is the fact that we still do not have much information about possible immediate or long-term effects on the health of the workers caused by chemicals used and being developed.
3 Developed countries have passed strict laws while in developing countries workers still come into contact with toxic substances.
4 Nearly all of them, because chemicals are used in every type of industry, from mining, welding, mechanics and factory work, to office work, etc.
5 It is agriculture where workers spray toxic herbicides and pesticides.
6 Workers have to wear protective clothing and are provided with washing facilities and regular medical check-ups.
7 By being informed about the hazards of the substances they produce or work with.

UNIT 12 Types of chemicals in the workplace

A. **1** (to) decompose/decomporre, **2** (to) detect/scoprire, rivelare, trovare, **3** dangerous/pericoloso, rischioso, **4** tiny/minuscolo, **5** (to) give off/emettere, rilasciare, **6** damaging/dannoso, **7** (to) inhale/inalare, **8** remove/eliminare, **9** (to) turn into/trasformare, **10** possibility/possibilità, **11** caution/precauzione, **12** serious/severi, critici.

B. **1** solids, **2** gases, **3** solids, **4** liquids, **5** dusts, **6** vapours/gases, **7** gases, **8** liquids, **9** solids, **10** dusts, **11** liquids, **12** liquids/dusts.

UNIT 13 Biological hazards

A.

	Diseases / Illnesses	Italian equivalent	Level of hazard	Pathogen and route of entry	Safety Precautions
1	Lyme disease	**Malattia di Lyme/Borreliosi**	**2**	**Parasite/ contact**	**Proper hand, eye and body protection.**
2	Measles	**Morbillo**	**2**	**Virus/ inhalation**	**Proper hand, eye and body protection.**

3	Athlete's foot	**Piede di atleta**	**2**	**Fungi/contact**	Keep toes dry in between after bathing. Avoid walking barefoot. Wear shoes which breathe well.
4	Hepatitis B	**Epatite B**	**2**	Virus/contact (bloodborne)	**Proper hand, eye and body protection.**
5	Dengue fever	**Dengue**	**4**	Virus/contact (mosquito bite)	**Use airtight Hazmat suit with oxygen supply.**
6	Farmer's lung	**Polmone del contadino**	**2**	**Fungi/ Inhalation**	Make sure that crops are adequately dried prior to store.
7	Ebola virus	**Ebola**	**4**	**Virus/contact**	**Use an airtight Hazmat suit[1] with his or her own oxygen supply.**
8	Typhus	**Tifo**	**3**	**Parasite/ contact**	**Use of very specific safety equipment and clothing (PPE).**
9	Smallpox	**Varicella**	**4**	Virus/inhalation	**Use an airtight Hazmat suits[2] with their own oxygen supply.**
10	Anthrax	**Carbonchio**	**3**	Bacteria/ contact	**Use of very specific safety equipment and clothing (PPE).**

B. **1** A biological hazard, also known as a biohazard, is an organism or a by-product from an organism that is harmful or potentially harmful to other living things, primarily human beings.
2 They are viruses, that can cause AIDS; bacteria, that can cause intestinal diseases; fungi, that can cause asthma/allergies; parasites, that can cause typhus.
3 There are four levels, safety precautions go from simply wearing gloves to wearing Hazmat suits.

UNIT 14 Frequently experienced work injuries

A. **1**g to suffer work injuries, **2**f to carry out manual work, **3**h to run serious risks, **4**e to keep areas clear, **5**a to take regular breaks, **6**c to experience vision problems, **7**b to avoid over-stacked files, **8**d to dispose of waste material.
Italian equivalent: **1** avere un infortunio, **2** svolgere lavoro manuale, **3** correre seri rischi, **4** tenere le zone libere, **5** fare pause in modo regolare, **6** incorrere in problemi di vista, **7** evitare cataste di documenti, **8** smaltire il materiale di scarto.

B. **1** Injuries to their heads, necks and backs.
2 Repetitive Strain Injury (RSI) such as pain and numbness to the wrists, arms, shoulders and neck.
3 Problems with their vision such as headaches, eye strain and blurring.
4 Burn injuries.
5 Injuries caused by trips, slips and falls.

C. **1** They report that construction workers are more likely to have accidents at work.
2 They must be free from holes and obstacles and must not be slippery or uneven.
3 They can cause painful back and neck injuries.
4 Because shelves are not strong enough and are over-stacked with files and stationary.
5 They are: pain and numbness to the wrists arms, shoulders and neck.

6 Those who use their hands and arms in repetitive movements for much of the day.

UNIT 15 Musculoskeletal disorders

A. **1**d, **2**a, **3**c, **4**f, **5**e, **6**b.

B. **1**T, **2**T, **3**T, **4**T, **5**F, **6**F.

C. **1** head, **2** eye, **3** ear, **4** nose, **5** mouth, **6** neck, **7** shoulder, **8** elbow, **9** waist, **10** wrist, **11** hand, **12** thigh, **13** knee, **14** leg, **15** foot, **16** feet, **17** face, **18** chest, **19** arm, **20** hip, **21** upper limbs, **22** fingers, **23** lower limbs, **24** toes.

D. **1** They affect the back, neck, shoulders and upper limbs, less often they affect the lower limbs, in particular they affect the body's muscles, joints, tendons, ligaments and nerves and most of them develop over time.
2 They can cause discomfort and minor pains but also serious medical conditions requiring treatment and recovery. They may also cause permanent disability.
3 For the employee they cause personal suffering and loss of income; for the employer they reduce business efficiency; and for governments they increase social security costs.

UNIT 16 Personal Protective Equipment (PPE)

A. **1** helmet, **2** ear caps, **3** goggles, **4** overalls, **5** safety shoes, **6** respirator, **7** gloves, **8** earmuffs, **9** earplugs, **10** screen/shield.

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

C. **1** Falling objecst or flying objects or contact with electrical conductors. Hair getting caught in machine parts (belts, chains). **2** Falling or rolling objects, sharp objects, wet and slippery surfaces, molten metals, hot surfaces and electrical hazards. **3** Flying fragments large chips, hot sparks, optical radiation, splashes from molten metals, objects, particles, sand, dirt, dusts, glare. exposure to harmful substances. **4** Exposure to heat and radiation, to hot metals, scalding liquids, body fluids and waste. **5** Exposure to high noise levels. **6** Breathing air contaminated with dusts, fogs, fumes, gases, smokes, sprays, or vapours.

UNIT 17 Ergonomics

A. **1**c, **2**b, **3**a, **4**b.

B.

Eyes	They must be 65-75 cm away from the screen, at the same height as its frame.
Elbows and wrists	The angle of the elbow must be at 90°-100° and wrists must be free and in a straight line with the forearm.

Hip, knees and feet	Both angle of hip and angle of knee must be at 90°-100° with legs. The feet must touch the floor or be supported by a pedestal.
Shoulders and back	Shoulders must be relaxed and the back must be properly supported according to its natural arch.
Keyboard tray and chair	The keyboard tray must be lower than the table without touching the knees, while the chair must be adjusted to the person's height and the table.

UNIT 18 Psychological hazards: work-related stress

A. **1 work** demands, **2** job **stress**, **3 career** expectations, **4 research** results, **5 shift** work, **6 air** pollution, **7 job** failure, **8** work **role**.

B. **1** work-related stress, **2** high risk jobs, **3** psychological hazard, **4** emotional condition, **5** different concepts, **6** sense of satisfaction, **7** lead to stress, **8** heavy workloads, **9** poor career prospects, **10** cause for absenteeism.

UNIT 19 Models of EU good practice: Brunello Cucinelli S.p.A. Cashmere

A. **1** consists of, **2** fit in, **3** sets aside, **4** depend on, **5** runs along, **6** concerned with, **7** turned into.

B. **Possible answers**

Aspects	**The company's positive practices**
Working times	There are no part time jobs and no night shifts.
Working environment	The atmosphere is very familiar and informal but at the same time it is very professional. Personality is considered to be an important factor in terms of staff relationships.
Decisions concerning the company	Employees are actively involved in the planning and decision-making process and are encouraged to voice their opinions.
Working problems	Working problems are discussed during meetings held twice a year. Actions are immediately taken to resolve them. Then they are reviewed them two months later to see if the steps taken are working.
Individual and family problems	The company allows employees to arrange their working hours to fit in with family commitments. In fact, no formal permission is required if a staff member has to leave work early for family reasons.
Workers' health and safety	Management always puts the health and safety of the workforce first. Health promotion activities are regularly reviewed by the management team and the health of individual workers assessed periodically.

Workers' development	The company puts emphasis also on the training of workers, that is an ongoing practical experience.
Holidays	Efforts are made to give staff as much time off as possible. At traditional holiday times like Christmas and Easter, the company closes two days earlier than other organizations.
Factory facilities	Staff have a canteen where special meals can be prepared on request; break and rest rooms are also provided, and there is a medical service.
Company's social involvement	The community and the business are strongly interlinked. Almost every family in the community has at least one member working with the company. It has financed some of the community resources for culture and entertainment.

UNIT 20 Models of good practice: Volkswagen AG-Germany

A.

Opposites	In the text	Italian equivalent	Synonyms	In the text	Italian equivalent
previous	following	seguente	to evaluate	to assess	valutare
danger	safety	sicurezza	to offer	to provide	fornire
employer	employee	datore di lavoro	consistent	coherent	coerente
varied	repetitive	ripetitivo	to include	to cover	compremdere
to threaten	to protect	proteggere	to diminish	to alleviate	alleviare
consumer	manufacturer	fabbricante	adequate	appropriate	appropriate
collective	individual	individuale	to encourage	to promote	promuovere
to increase	to reduce	ridurre	inability	incapacity	incaapacità
to include	to eliminate	eliminare	slightly	consistently	in modo consistente
useless	worthwhile	utili/proficue	to raise	to lift	sollevare/
to cause	to prevent	prevenire	anxiety	stress	stress

B. Free.

SECTION 2 Final test

A. **1**d, **2**k, **3**i, **4**h, **5**j, **6**a, **7**c, **8**b, **9**e, **10**g.

B. **1** trench collapse, **2** work processes, **3** safety risks, **4** head impact, **5** health hazards, **6** work situation, **7** skin exposure, **8** fire precautions, **9** risk anticipation, **10** accident records.

C. **1** health hazards, **2** head impact, **3** work processes, **4** skin exposure, **5** safety risks, **6** trench collapse, **7** work situation, **8** accident records, **9** risk anticipation, **10** fire precautions.

D. **Possible answers**

1 Because for the vast majority of the chemicals, little or nothing is known about their possible immediate or long-term effects on the health of workers.

2 The main danger is that they can be inhaled into the lungs or absorbed into the bloodstream and can also cause eye damage.

3 Because there are no known treatments for level 4 biohazards, that are fatal if they are spread through contact and through the air.
4 They are pain and numbness to the wrists, arms, shoulders and neck. They may also include Carpel Tunnel Syndrome and tendonitis.
5 They affect mainly back, neck, shoulders and upper limbs, less often they affect the lower limbs. They may involve muscles, joints, tendons, ligaments and nerves.
6 They penetrate the ear canal and are used to prevent hearing loss or damage. They are made of foam, rubber or plastic and are either one-size-fits-all or in small, medium, and large sizes. Some are disposable, others are reusable.
7 Ergonomists consider all the physical aspects of a person, such as body size and shape; fitness and strength; but they also consider mental abilities, personality, knowledge and experience.
8 Stress is the harmful physical and emotional response that occurs when the requirements of the job do not match the capabilities, resources or needs of the worker. Challenge energizes and motivates workers psychologically and physically to learn new skills and master their jobs.

SECTION 3

UNIT 21 Crane hazards

A. **1** safety professionals, **2** fatality rates, **3** power lines, **4** construction industry, **5** grab rail, **6** crane operations.

B. **1** construction industry, **2** fatality rates, **3** crane operations, **4** power lines, **5** safety professionals, **6** grab rail.

C. **1** Owing to, **2** However, **3** either … or, **4** as a result of, **5** also, **6** Apart from, **7** In addition, **8** Both … and.

UNIT 22 Electricity

A. **1** through, **2** after, **3** above, **4** for, **5** from, **6** with, **7** against.

B. **1** expose, **2** explosions, **3** electrical, **4** current, **5** serious, **6** lose, **7** receives, **8** paralysis, **9** negligence, **10** prevention, **11** regular, **12** damaged.

UNIT 23 Scaffolding hazards

A. **1**h, **2**e, **3**c, **4**a, **5**d, **6**b, **7**f, **8**g.

B. **1** scaffolds/assemblare il ponteggio, **2** regulations/emettere regolamenti, **3** measures/prendere misure, **4** workers, employees/formare operai, lavoratori, **5** safety/assicurare sicurezza, **6** hazards/minimizzare i rischi.

UNIT 24 Hearing hazards

A. **1** orecchio esterno, medio, interno, **2** tromba di Eustachio alla gola, **3** nervo acustico al cervello, **4** timpano, **5** ossicini, **6** coclea.

B. **1** loss, **2** loudness, **3** exposure, **4** hazardous, **5** nerves, **6** preventive, **7** symptoms, **8** harmful, **9** permanent, **10** equipment.

C. **1** loss, **2** hazardous, **3** permanent, **4** nerves, **5** loudness, **6** exposure, **7** harmful, **8** symptoms, **9** preventive, **10** equipment.

UNIT 25 Excavation hazards

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

B. Possible answers

1 It defines it as any man-made cut, cavity, trench, or depression in the earth's surface due to earth removal.
2 It is a narrow excavation made below the surface of the ground in which the depth is greater than the width-and the width does not exceed 15 feet.
3 Trenches are found in workplaces where underground piping or cables are being installed or repaired.
4 The most common is a cave-in, that occurs when walls of an excavation collapse.
5 The weight of the collapsed walls may crush and twist the body of a worker causing death or serious injury in a matter of minutes.
6 They are sloping when the sides of the excavation are inclined; shoring, a structure that supports the sides of an excavation and shielding, a structure able to withstand a cave-in.

UNIT 26 Manual material handling (MMH)

A. **1** pushing, **2** moving, **3** grasping, **4** pulling, **5** lifting, **6** holding.

B.

B1	B2
a. upper **limbs** b. lifting **equipment** c. gradual **wear and tear** d. manual **handling** e. risk **assessments** f. poor **lighting** g. upright **posture** h. rest **periods** i. working **environments** l. musculoskeletal **disorders**	**1** When workers transport or support a load we say they do **manual handling**. **2** In most types of **working environments**, factories, farms, hospitals, building sites etc, workers need to handle heavy loads repetitively. **3** Workers who are exposed to continuous handling of loads may suffer from **musculoskeletal disorders** with different types of injuries. **4** The damage may affect **upper limbs**, lower limbs and the back. **5** Repetitive manual handling can cause a **gradual wear** of muscles, tendons, ligaments, bones and joints. **6** Workers should maintain and **upright posture** to protect the natural curves of the back. **7** In order to take preventive measures employers have to carry out **risk assessments**. **8** Using automation and **lifting equipment** are among the preventive measures that must be adopted to protect workers

UNIT 27 Hand and power tools

A1. **1** hammer, **2** screwdriver, **3** chain saw, **4** angle grinder, **5** electric drill, **6** chipper, **7** jackhammer.

A2.

A Used for	B Health hazards they pose	C Hazards caused by	D Preventive measures
Driving nails, fitting parts, forging metal and breaking up objects.	The user or another worker is struck by head of hammers.	– Loose, splintered or cracked head of the tool that flies off.	Correct use and proper maintanence.
Driving screws and rotating other machine elements with the mating drive system.	The user or another worker is struck by flying tips of screwdrivers.	– Screwdrivers used as chisels.	
Felling, limping, bucking, pruning,	Injury to limbs, eye damage, hearing damage.	– Blade. – Splinters and saw dust. – Noise level. – Clothing getting stuck in the blade of the chainsaw.	– Tools must be equipped with a momentary contact "on-off" control switch if the blade diameter is greater than 2 inches or by a constant pressure switch that will shut off the power when the pressure is released. – Tools must be inspected closely to be sure they are free from cracks or defects. – Workers must use Personal Protective Equipment (PPE).
Cutting, grinding and polishing.	– Shocks.	– Flying fragments.	
Drilling holes in various materials or fastening various materials together with the use of fasteners.	– Eye irritation, may cause the drill user to lose control of the drill.	– The heat generated by the electrical current may ignite a fire.	
Reducing wood (generally tree limbs or trunks) into smaller parts, such as wood chips or sawdust.	Getting caught in the machine and being pulled into the fast-turning chipper knives.	Serious injuries.	
Breaking asphalt, concrete and rocks.	– Hearing damage. – Injury to feet and other parts of the body.	– Noise hazards. – Lack of training.	

UNIT 28 Fires and explosions

A.

Verb	Italian equivalent of verb	Adjective	Noun
explode	**esplodere**	**explosive**	explosion
reduce	**ridurre**	**reduced**	**reduction**
prevent	**prevenire**	preventive	**prevention**
rise	**aumentare, salire**	rising	**rise**
produce	**produrre**	**productive**	production
press	**premere**	**pressing**	**pressure**
poison	**avvelenare**	**poisonous**	poison
identify	**identificare**	identifiable	**identification**
select	**selezionare**	**selective**	selection
involve	**coinvolgere**	involving/involved	**involvement**
remove	**eliminare**	**removing/removed**	removal

B.
1 Fires and explosions involve a number of workers in all kinds of workplaces.
2 Dangerous flammable substances are used in a larger number of working processes.
3 An explosive atmosphere is created by the accumulation of flammable substances or materials.
4 An explosion can be caused by a rapid spread of flames and a rise in pressure.
5 Even confined places in a plant may be reached by flames.
6 Flammable vapour is given off by liquids and solvents when mixed with air.
7 Everyday materials such as coal, wood and grain can produce clouds of combustible dusts.
8 The cylinder can be ignited by uncontrollated releases of gas.
9 Fires with poisonous smoke can be caused also by solids such as packaging, textiles and plastic foam.
10 OSHA requires preventive measures in connection with the work processes that industries are carrying out.

UNIT 29 Tractor hazards

A. **1** forward, **2** far, **3** slow, **4** minor, **5** smooth, **6** seldom, **7** gentle, **8** dangerously, **9** frequently, **10** loose, **11** aware, **12** soft.

B.

Hazards	Risks/Incidents	Safety Measure
Overturns	• Turning or driving too close to the edge of a bank or ditch. • Driving too fast on rough roads and lanes. • Running or bouncing off the road or lane. • Driving a tractor straight up a slope that is too steep.	• Rollover protective structure (ROPS)
Runovers	• Passenger (extra rider) on the tractor falls off. • Tractor operator falling off or knocked out of the seat by obstacles. • Operators are run over while being on the ground near the tractor. • Operators are run over while trying to mount or dismount a moving tractor. • Children are run over while running towards tractors in gear.	• Extra riders should keep a tight handgrip on the tractor. • Rops and seat for extra drivers with arm or back rest. • Shut off the tractor, set the brake or place it in park.
Power- take off entanglements	• Have an arm or leg caught or pulled into and around a pto stub shaft.	• PTO master shield to protect the tractor operator and helpers.

UNIT 30 First-aid in the workplace

A. **1** ventricular **fibrillation**, **2** permanent **damage**, **3** cardiac **arrest**, **4** prevent **choking**, **5** survival **rate**, **6** keep **warm**, **7** health **incidents**, **8** anaphylactic **reaction**, **9** check **the pulse**, **10** potential **risks**.

B. **1** potential risks, **2** permanent damage, **3** cardiac arrest, **4** ventricular fibrillation, **5** survival rate, **6** health incidents, **7** anaphylactic reaction, **8** check the pulse, **9** prevent choking, **10** keep … warm.

C. **1** Because it can mean the difference between life and death.
2 They are designed in relation to the specific working environments.
3 Because it provides the critical and necessary treatment for sudden cardiac arrest.
4 It is to check the victim's pulse to see if the blood circulation is good.
5 Because they might cause suffocation.

SECTION 3 Final test

A. **1**f, **2**g, **3**e, **4**h, **5**d, **6**b, **7**c, **8**a.

B. **1** greater, **2** most likely, **3** less, **4** the most common, **5** Most, **6** higher, **7** faster, **8** more serious, **9** less serious, **10** larger.

C. **1** give **off**, **2** carry **out**, **3** run **over**, **4** fall **off**, **5** pull **into**, **6** shut **off**, **7** divide **into**, **8** take **over**, **9** get **into**, **10** break **out**.

D. **1** fell off, **2** get into, **3** take over, **4** divided into, **5** carried out, **6** gives off, **7** pulled into, **8** shut off, **9** broke out, **10** run over.

SECTION 4

UNIT 31 Some facts about climate change

A.

Climate change		
Human activities.	Gases released.	Negative environmental/health consequences.
Burning fuels: coal, oil, gas, wood.	**Carbon dioxide gas.**	Global warming: **causing changes in the amount and pattern of rain and snow, length of seasons, in the frequency and severity of storms, and in sea level. Harmful effects on forests, plants and animals.**
Rice paddies, cattle, coal mines, gas pipelines, and landfills.	Methane.	
Fertilizers and other chemicals.	**Nitrous oxide.**	
Refrigerators, air conditioners and industrial applications.	Chlorofluorocarbons (CFCs) gases: chlorine, carbon, fluorine.	Ozone destruction: **with harmful ultraviolet light causing skin cancer, damage to plants and animals.**

B. **1** carbon dioxide gas, **2** greenhouse effect, **3** to burn fuels, **4** in the patterns of rain, **5** natural environment, **6** harmful gases, **7** nitrous oxide, **8** ultraviolet light, **9** global warming, **10** air conditioners.

UNIT 32 Climate change and health

A.

Facts about climate change	Effects on environment	Effects on people's health and life
Burning fuels, Release of carbon dioxide, **global warming.**	Rising of sea levels Melting of glaciers.	
	Extreme high air temperatures. Changing patterns of rainfalls.	**Cardiovascular and respiratory diseases.** Reduction in the water supply, lack of hygiene. **Diarrhoeal disease.** Lower production of essential food in poor countries Drought, famine, deaths.
	Increase of aeroallergens.	Asthma.
Floods.	Contamination of freshwater supplies.	**Water and insect borne diseases.** Malaria. **Drowning and physical injuries.** Houses damages. Disruption of medical and health services. **Malnutrition and under nutrition.**

B. **1** has released, **2** has caused, **3** has trapped, **4** has affected, **5** are rising, **6** are melting, **7** is affecting, **8** rise, **9** affect, **10** have increased, **11** have lost, **12** have never been able, **13** will be exposed, **14** will get worse.

UNIT 33 Floods and health

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

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

C. **1**c, **2**f, **3**e, **4**h, **5**a, **6**b, **7**d, **8**g.

UNIT 34 Flood prevention and safety

A. **1**bq, **2**ir, **3**ao, **4**hn, **5**js, **6**gk, **7**fp, **8**em, **9**dl, **10**ct.

B. **Possible answers**

1 There are projects such as the underground storage of water, storing water in reservoirs in large parking garages and turning a playground into a small lake during heavy rainfall. There is a project to construct a floating house development of 120 acres.
2 Rural areas are deliberately flooded in emergencies.
3 It could have prevented unnecessary damage if it had had a flood control system like the Netherlands.
4 They should wear hard hats, goggles, heavy work gloves, life-jackets, watertight boots with steel toes and insoles.
5 Electricity is a danger after flooding because electrical lines are often exposed and currents can travel through remaining flood water over a distance of more than 100 metres.
6 Flood water can be contaminated with sewage and pollutants such as pesticides, oil or chemical waste.
7 They should wear PPE because they might come into contact with exposed electrical line, sharp-jagged debris, blood or body fluids and animal and human remains.

UNIT 35 Water pollution

A. **1** They are classified as point source, non-point source and groundwater pollution.
2 The main sources are: domestic sewage, wastewater from manufacturing and processing industries, agricultural waste, abandoned hazardous waste sites, oil spillages and dumping.
3 Domestic sewage is wastewater generated from household activities.
4 Leaching is groundwater pollution.
5 Algal bloom is responsible for the suffocation of fish and other organisms.

B. **1** is … considered, **2** were released, **3** was stopped, **4** were injured, **5** were extensively damaged, **6** washed up, **7** is … contaminated, **8** be felt, **9** are linked, **10** have been used, **11** are banned, **12** is committed.

UNIT 36 Earthquakes

A. **1** tsunamis, **2** seismological, **3** waves, **4** hypocentre, **5** shifted, **6** reactors, **7** evacuated, **8** toll, **9** missing, **10** recover.

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

UNIT 37 Nuclear power stations

A. **1** sources, **2** radon, **3** energy, **4** fission, **5** waste, **6** radioactive, **7** dumped, **8** storage, **9** shutdown, **10** fusion.

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

C. **1** is stored, **2** have … been installed, **3** will be used, **4** must be kept, **5** is being carried out, **6** was constructed, **7** can be used, **8** is … associated

UNIT 38 Radiation effects – Part 1

A. **1** reproduce/reproduction/reproductive, **2** convert/conversion/convertible, **3** destroy/destruction/destructive, **4** persist/persistence/persistent, **5** cause/cause/causative, **6** reduce/reduction/reduced, **7** reflect/reflection/reflective.

B. **1** reproduction, **2** persist, **3** destructive, **4** reflective, **5** reduce, **6** cause, **7** converted.

C.

Latin	Germanic
radiation	health
tract	brain
system	heart
ability	blood
symptom	hair
cell	body

UNIT 39 Radiation effects – Part 2

A.
1 Radiation-caused malignancies appear after ten years (a decade).
2 The distance from the hypocenter.
3 After 30 days 200-300 REM is a lethal dose to 10-35% of the population.
4 Keloids were foundin 50% of those burned by exposure to heat rays within 1.2 miles of the hypocenter.
5 20-100 REM results in temporary reduction in white blood cells.

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

C. Blood: red cells, white cells, haemorrhage, anemia
Cancer: tumour, leukemia, breast, lung, thyroid, malignancies, carcinogenic.

D.

adjectives	In the text
damaged	damage
anaemic	anaemia
populated	population
cancerous	cancer
swollen	swell
exposed	exposure
scarred	scar

UNIT 40 EU plans to reduce environmental risks

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

B. **1** held a ministerial conference, **2** reduce environmental threats, **3** set specific objectives, **4** to provide equal opportunities, **5** were suffering from health problems, **6** took a leading role, **7** rationalize energy use, **8** focused their attention, **9** attributed a strong responsibility, **10** boost innovation.

SECTION 4 Final test

1 garbage, **2** sewage, **3** debris, **4** trash, **5** litter, **6** rem, **7** dose, **8** cataracts, **9** cancer, **10** keloids, **11** subsidence, **12** seismic, **13** rubble, **14** quicksand, **15** liquefaction, **16** dams, **17** levees, **18** sandbags, **19** reservoirs, **20** high tides, **21** fission, **22** fusion, **23** atom, **24** shutdown, **25** reactor.

B. **1** caused, **2** injured, **3** was washed, **4** floating, **5** have found, **6** pose, **7** has been studying, **8** is estimated, **9** produces, **10** is made up, **11** are suspended, **12** biodegrade, **13** be ingested, **14** have been formed, **15** are eating.

C.
1 It is any change in the physical, chemical and biological properties of water that has a harmful effect on living things.
2 All buildings should meet earthquake construction requirements.
3 The BP oil spillage disaster.
4 Flooding.
5 The size of the dose, the ability of the radiation to harm human tissue, which organs are affected.
6 Keloids are mounds of swollen flesh from scar tissue that have grown abnormally.
7 Radiation consists of subatomic particles travelling near the speed of light. It is energy in the process of being transmitted. It can be natural or artificially made.

8 Nuclear waste is stored in temporary facilities in about 340 locations around the world. There is still not a safe system for dealing with it.
9 The Netherlands has projects that include underground storage of water, storing water in reservoirs in large parking garages and the possibility of turning a playground into a small lake.
10 Clean-up workers can encounter sharp, jagged debris, biological hazards, exposed electrical lines, blood and other body fluids and human and animal remains, vehicle-related dangers. They can be exposed to carbon monoxide, heat or cold stress, fire, drowning and musculoskeletal hazards.