Capitalization – The first word of a sentence is capitalized & punctuated as usual. Each bullet point answer begins with capitalization and ends with a period. Bullet point answers that complete a sentence with the question above are not capitalized, but end with a period (…).

**Self-Check Questions**

**Unit 1**

**1.1**

1. Describe the concept of sustainable development.

Sustainable development reconciles *economic*, *environmental,* and *social* aspects. It is intended to enable an *economic system that can be sustained in the long term.*

2. Mark the correct sentence completion(s).

The exclusion principle for goods ...

* ... limits access to goods through bans.
* ... *is applicable to all goods*.
* ... *describes the possibility of use of a good by several persons*.
* ... applies exclusively to services.

3. List the five factors of the IPAT formula.

*Population, demand factor, resource factor, efficiency factor, emission factor.*

**1.2**

1. Mark the correct normative-ethical imperatives of sustainable development.

* *Intergenerational equity.*
* Environmental equity.
* *Intragenerational equity.*
* Social equity.

Complete the following sentence:

Normative-ethical justifications for sustainability or sustainable development take place on the *overall societal level* with *sustainability as the goal* and on the *actor-related* level with *sustainable development as the way* to achieve the goal.

**1.3**

1. Correct or incorrect?

In the cradle to cradle approach, waste is valued negatively.

* Correct.
* *Incorrect.*

The cradle to cradle approach is based on the sufficiency strategy.

* Correct.
* *Incorrect.*

Bionics means nature learning from technology.

* Correct.
* *Incorrect*

The consistency strategy is fundamental to the cradle to cradle approach.

* *Correct*
* Incorrect

List the key connection of bionics to the guiding principle of sustainable development.

*The key connection of bionics to the guiding principle of sustainable development is the application of the efficiency strategy by making the efficient solutions of nature accessible to man via technology.*

**Unit 2**

**2.1**

1. Describe the world model of the Limits to Growth.

In the world model of the Limits to Growth, the key stock variables of *population* and *industrial production* andtheir growth rates are compared with the limited *sources* and *sinks* ofthe global ecosystem. The *long-term development* of the stock sizes is modeled.

2. Mark the correct sentence completion(s).

The beginning of the Rio process brought about ...

* ... the Universal Declaration of Human Rights.
* ... *the first Framework Convention on Climate Change*.
* ... the Agenda 2010.
* ... *the Declaration on Environment and Development*.

3. Distinguish between the approaches to handling climate change.

*Mitigation includes measures to avoid and reduce greenhouse gas emissions to stop or at least slow down climate change.*

*Adaptation includes measures that address adaptation to inevitable climate change.*

**2.2**

1. Complete the sentences.

Environmental problems are found at *global*, *regional,* and *local* levels. They are interconnected through the *complex global ecosystem. Tipping points* are *regional subsystems* of the global ecosystem whose function may collapse from an *unknown point*, with unforeseeable consequences.

2. Mark the correct sentence completion(s).

Water scarcity is a regional problem because ...

* ... Germany is a federal state.
* ... water can not be transported.
* ... *water resources* are regionally *interconnected.*
* ... access to water is a human right.

**2.3**

1. Mark the correct sentence completion(s).

Globalization is promoted by ...

* ... *the reduction of tariffs*.
* ... *the decreasing costs of transport*.
* ... the dismantling of border fences.
* ... increasing international conflicts.

2. Describe how a company may be confronted with costs when using environmental sinks.

*Costs for the use of environmental sinks can be:*

* *Water: costs for the discharge of wastewater (wastewater levies).*
* *Soil: costs for sealing land (sealing levies).*
* *Air: costs for the emission of pollutants (certificates)*

**2.4**

1. Describe why strong population growth is a key problem for the social development of a state.

*Strong population growth is a key problem for a state's social development because absolute successes in development (e.g., higher food production, more hospital beds, more schools) often do not translate into relative improvements per capita (e.g., no higher food production per capita, fewer hospital beds, or schools per capita).*

2. The development of a state can be described by the following index:

* Sustainable Development Index.
* Social Development Index.
* Hunger Development Index.
* *Human Development Index.*

**Unit 3**

**3.1**

1. Place the following levels of sustainable development in a meaningful order: strategies, targets/indicators, policy dimensions of action, management rules, implementation/instruments, conceptualization, idea.

*A meaningful order is:*

1. *Idea.*
2. *Conceptualization.*
3. *Management rules.*
4. *Strategies.*
5. *Policy dimensions of action.*
6. *Targets/indicators.*
7. *Implementation/instruments.*

*The order results from the increasing degree of concreteness.*

2. Distinguish between bans and mandates as instruments for implementing sustainable development.

*Bans prohibit or restrict specific unsustainable activities. Mandates require specific activities to promote sustainable development.*

**3.2**

1. Describe which tasks a company has in the context of sustainability management.

*Within the framework of sustainability management, companies are assigned the following tasks: Environmental tasks are aimed at a reduction of the environmental impact caused by a company's activities, e.g., in production or logistics. Social tasks involve a reduction of undesirable social effects caused by a company through its activities, e.g., improvement of working conditions. Economic tasks handle the economic design of the environmental or social tasks and compare costs and returns. The integration task requires the integration of environmental and social tasks into a conventional, primarily economically oriented management.*

2. Complete the sentences.

Sustainability management in the form of *Business Sustainability 2.0* focuses on the internal management of economic, environmental, and social *external opportunities and risks* of a company. This is referred to as the *inside-out perspective.* *Business Sustainability 3.*0 focuses on the contribution of companies to solving problems in the framework of a sustainable development. This perspective is characterized as an *outside-in perspective.*

**3.3**

1. Mark the correct sentence completion(s).

Civil society includes ...

* ... *the churches*.
* ... *the citizens*.
* ... the Federal Environment Agency.
* ... *the citizens' initiatives*.

2. List the areas of need that are relevant to sustainable consumption.

*The following areas of need are relevant to sustainable consumption: mobility, food, housing/household, work, clothing ,and leisure.*

**Unit** 4

**4.1**

1. Mark the correct sentence completion(s).

The System Dynamics methodology is based on ...

* ... *the systems theory*.
* ... the feedback theory.
* ... thermodynamics.
* ... *cybernetics.*

2. Complete the sentences.

Systems are represented in the methodology of system dynamics as *cause-effect relationships*. They are connected by *feedback relationships* that can be both *positive* and *negative* and are typically *not linear,* but rather are *exponential* or *logarithmic,* among others.

3. Describe the content of a technology assessment.

*The subject of a technology assessment is technological developments. Their evaluation is not left entirely to the market, but rather non-market aspects, such as the environmental and social effects of an innovation, are also considered, and risks or opportunities are highlighted.*

**4.2**

1. List the main regulatory areas of environmental law.

*The main regulatory areas of environmental law are related to: resources and substances, facilities, and surfaces.*

2. Place the following management types of the Closed Substance Cycle Waste Management Act in the correct order of the waste hierarchy: prevention, disposal, recycling, reuse, other recovery.

*The waste hierarchy states that the following order of priority is established for the management types:*

* *Prevention.*
* *Reuse.*
* *Recycling.*
* *Other recovery.*
* *Disposal.*

3. Mark the correct sentence completion(s).

The following basic obligations apply to operators of installations according to BImSchG:

* + - General avoidance mandate.
		- *Energy conservation mandate.*
		- *Prevention mandate.*
		- Resource ban.

**4.3**

1. Distinguish between three types of criteria catalogs for environmental and social requirements for corporate sustainability management.

*Normative frameworks are general guidelines that specify environmental and social criteria for sustainability management. Process guidelines are specifications that contain measures for increasing eco- or socio-effectiveness. Management systems provide a systematic framework within which the increase in eco- or socio-effectiveness in the company can be planned, implemented, monitored, and improved.*

Distinguish between key figures (in a strict sense) and indicators.

*In a strict sense, indicators are used for directly measurable variables, i.e. quantitative statements. Indicators are used as a proxy for qualitative phenomena that cannot be measured directly and* *are intended to allow conclusions to be drawn about their development.*

**4.4**

1. Mark the correct components of a life cycle assessment:

* *Analysis interpretation.*
* *Life cycle inventory.*
* Movement analysis.
* *Impact analysis.*
* Environmental analysis.

2. Delineate the scopes of consideration of a carbon footprint.

*A carbon footprint is delineated between the following scopes: Scope 1 is the direct emissions caused within a company itself. Scope 2 is indirect emissions from a company's energy supply. Scope 3 includes all other indirect emissions from upstream and downstream processes.*

**Unit 5**

**5.1**

1. Mark the correct sentence completion(s).

Quality is described by ...

* ... *characteristics*.
* ... technology.
* ... opinions.
* ... *requirements*.
* ... test ratings.

2. Distinguish between quality control, quality assurance, and quality management.

*An inspection of quality at the end of a process is referred to as quality control. Quality assurance is characterized by in-process controls. Quality management includes the planning, implementation, monitoring, and correction of all company processes to provide quality.*

**5.2**

1. Complete the sentences.

*Minor defects* have *insignificant consequences* for the customer, since the use of an item is hardly affected. Nonconformities in the form of *critical defects* can have *serious negative* consequences for users in the form of health hazards. If usability is *severely impaired*, a *major defect* exists.

2. Mark the correct sentence completion(s).

Risk can be described as a function of the following elements:

* *Probability.*
* *Effect.*
* Failure symptoms.
* *Event.*
* Perception.

**5.3**

1. Describe the six features of services.

*Services are largely immaterial. Services are characterized by intangibility. Services are indivisible. Services cannot be stored. Services require an external factor. Services are individual and variable.*

2. Mark the correct sentence completion(s).

The gap model describes the key gap as the gap between ...

* ... *the service expected and the service experienced*.
* ... the previous experience and the service experienced.
* ... the recommendations and the service experienced.
* ... the concepts of the service provider and the service experienced.

**5.4**

1. Assign a scale to the following measurements: color, IQ, height, school grade.

*Color = nominal scale; School grade = ordinal scale; IQ = interval scale; Height = ratio scale.*

2. List the perspectives of a balanced scorecard.

*The perspectives of a balanced scorecard are:*

* + - *Financial.*
		- *Customer.*
		- *Process.*
		- *Learning and development.*

**Unit** 6

**6.1**

1. Complete the sentences.

Kaizen can be understood as the replacement of the *good* withsomething *better*. *Kaizen assumes* that what has been achieved is never *satisfactory.* Kaizen calls for *long-term*, *small* steps toward *continuous* improvement.

2. Arrange the steps of Deming's management control cycle in the correct order: Plan, Act, Check, Do.

*(1) Plan, (2) Do, (3) Check, (4) Act.*

**6.2**

1. List the aspects to which the assessment of the risks of failure in the FMEA refers.

*The assessment of the risks of failures in the FMEA refers to the following aspects:*

* *Probability of occurrence of the failure (factor A).*
* *Significance of the failure effects from the customer's point of view (Factor B).*
* *Probability of detecting the defect before delivery or customer contact (Factor E).*

2. Mark the correct sentence completion(s).

The risk priority number is calculated according to the formula(s):

* $ A∙B ∙E$
* $A+B+E$
* $B ∙A ∙E$
* $B+E+A$

**6.3**

1. List the seven most common quality tools.

*Fault collection chart, histogram, process control chart, Pareto analysis, fault tree analysis diagram, correlation diagram, cause-effect diagram.*

2. Describe the difference between the fault tree diagram and cause-effect diagram.

*A cause-effect diagram specifies seven categories of fault causes: manpower, method, machine, management, mother nature, material, and measurability. The fault tree diagram does not specify the causes of faults and thus allows open brainstorming during the fault analysis.*

**6.4**

1. Indicate whether the following audits are first, second or third-party audits:

* Customer audit = *second-party audit.*
* Certification audit = *third-party audit.*
* Internal audit = *first-party audit.*
* Supplier audit = *second-party audit.*

Mark whether the following statements are correct or incorrect.

Certifiers are audited by the DAkkS.

* Correct.
* *Incorrect.*

Certifiers only conduct customer audits.

* Correct.
* *Incorrect.*

Supplier audits are external audits.

* *Correct.*
* Incorrect.

The DAkks accredits the certifiers.

* *Correct.*
* Incorrect.

**Unit 7**

**7.1**

1. Complete the sentences.

*DIN EN ISO 9000* describes the basic principles for quality management systems and defines terms. *DIN EN ISO 9001* specifies the minimum requirements for a quality management system and refers back to the basic principles and terms of *DIN EN ISO 9000*. *DIN EN ISO 9004* goes beyond the requirements of *DIN EN ISO 9001* and contains comprehensive guidance and evaluation criteria for business success.

Assign the following section topics of DIN EN ISO 9001 to the Deming management control cycle.

* Leadership: *plan.*
* Context of the organization: *plan.*
* Improvement: *act.*
* Performance evaluation: *check.*
* Operation: *do.*
* Support: *do.*
* Planning: *plan.*

**7.2**

1. Describe the interrelationships of the EFQM model building blocks.

*The EFQM model is based on three interrelated building blocks: the basic concepts, the criteria model, and the RADAR assessment methodology. The basic concepts describe general success factors of a TQM. The criteria model concretizes the basic concepts by defining weighted enabler and result criteria. Enablers show how a company should act. Results indicate what a company actually achieves. Using the RADAR assessment methodology, numerical values are generated according to the weightings of the criteria model, which then reflect the maturity level of TQM according to the EFQM model.*

2. Assign the following topics to an enabler (E) or a result (R) in the EFQM model:

* Employee satisfaction: *E.*
* Employee competence: *R.*