



Professional Engineering Exam Common Part Study Guide

Saudi Council of Engineers (SCE)
Education and Training Evaluation Commission (ETEC)
National Center for Assessment (NCA)

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1. Aim

The objective of this Instruction Manual is to provide guidelines for the NCA proposed Professional Engineers Exam. These guidelines cover the eligibility conditions, the grading and passing conditions, the structure of the exam and the distribution of exam questions among various areas. In essence, this Instruction Manual represents a “bridge” between the developed exam standards and the actual phrased questions. It is designed to help item writers prepare questions for the Common Paper to be taken by all examinees regardless of their disciplines.

2. Exam Structure

2.1 Exam Type

The exam is initially paper-based with questions being a combination of multiple-choice questions (MCQ) and essays.

2.2 Exam Organization

The exam is conducted in two sessions during one day. The duration of the first session is 2.5 hours while the second section is 4 hours long. There is one-hour break between the two sessions.

2.2.1. Session #1

The first session is the common part to be taken by all the examinees from all disciplines. This part includes seven topics: (Ethics – Professionalism - Laws for Professional Practice, Professional Laws and Regulation - Environment and Natural Resources - Engineering Management - Engineering Economics - Health, Safety and Security (HSS)).

The total time duration of this session is 2.5 hours and the total number of questions is 30 MCQ and 2 essays.

2.2.2. Session #2

The second session is the Discipline Part. The following engineering disciplines are considered:

Code	Discipline
STE	Structural Engineering
GTE	Geotechnical Engineering
TRE	Transportation Engineering
WREE	Water Resources and Environmental Engineering
PE	Power Engineering
HVAC	Heating, Ventilation, and Air Conditioning (HVAC) and Refrigeration Engineering
TFSE	Thermal and Fluids Systems Engineering
CHE	Chemical Engineering
FPE	Fire Protection Engineering
ARCH	Architecture

The total duration of this session is 4 hours and the total number of questions is 30 MCQs and a number of essay questions.

2.3 Eligibility for the Exam

As per Saudi Council of Engineers Requirements.

2.4 Grades

Each part (common part and discipline part) carries a total grade of 100. The MCQs carry a grade of 60% while the essays carry a grade of 40%. Each MCQ has 4 choices for the answer. There is no negative marking for wrong answers.

2.5 Passing Rules

- The eligible candidate must take in his/her first sitting the two exam parts (common part and discipline part).
- In order to pass the exam, the candidate must obtain a grade of 60% or above in each part of the exam.
- If the candidate fails both parts of the exam (by receiving in each part a grade less than 60%), he/she can take the two parts of the exam but only when one full year has passed.
- If the candidate fails only one part of the exam (common part or discipline part), he/she must repeat only the part he/she failed, but he/she must pass this part within one year.
- If a year has passed and the candidate did not succeed in passing the part he/she failed, then he/she has to take both parts of the exam.

2.6 Exam Rules

- No printed or electronic material is allowed during the exam. All necessary reference materials will be provided by NCA.
- Calculators approved by NCA are allowed.
- Comprehensive exam rules will be provided by the examination authority, NCA, in a separate manual.

3. Table of Specifications for NCA Professional Engineering Exam: Common Part

Major Area	Multiple Choice Questions (MCQs)		Number of Essay Questions	Engineering Standard
	%	Number of questions (MCQ)		
1. Ethics	27	8	1 (Compulsory)	CMP-T1
2. Professionalism	23	7	1 (Compulsory)	CMP-T2
3. Laws for Professional Practice, Professional Laws and Regulation	10	3		CMP-T3
4. Environment and Natural Resources	10	3	-	CMP-T4
5. Engineering Management	10	3	-	CMP-T5
6. Engineering Economics	10	3	-	CMP-T6
7. Health, Safety and Security (HSS)	10	3	-	CMP-T7
Total	100%	30	Two Compulsory Essays	



4. Standards For Common Part

CMP-T1: Ethics

- CMP-T1-1** Understand engineering ethics and uphold the code of ethics formulated by the Saudi Council of Engineers and any established codes of conduct associated with the engineering profession.
- CMP-T1-2** Demonstrate an understanding of the ethical responsibility of a professional engineer to ensure the health and welfare of the public.
- CMP-T1-3** Protect and guard the confidentiality and interest of the client.
- CMP-T1-4** Preserve the reputation and prestige of the profession and protect the rights of the professional engineer including the right to act ethically.
- CMP-T1-5** Divulge any real or perceived conflict of interest to relevant parties and avoid any situation through which they may arise.
- CMP-T1-6** Show respect for all humans and avoid any form of discrimination or bias.
- CMP-T1-7** Follow established procedures when detecting ethically questionable situations, seek appropriate advice from colleagues and utilize appropriate references such as the Saudi Council of Engineers Code of Ethics.
- CMP-T1-8** Protect the innocents and respect public right to consent.
- CMP-T1-9** Follow all legal regulations very closely and avoid any actions which may be otherwise such as: corrupt, fraudulent or deceptive conduct. In addition, understand the need for immediate reporting when faced with, or knowing of, such situations.
- CMP-T1-10** Recognize, assess, and respond appropriately, and proportionally, to ethical dilemmas in practice area.
- CMP-T1-11** Demonstrate the importance and need for due-diligence and best practices in the engineering profession.
- CMP-T1-12** Demonstrate an understanding of the moral responsibilities of a professional engineer including the need to self-manage in an orderly and ethical manner, to balance the wider public interest with the interests of employers and clients, and to uphold standards in the engineering profession.
- CMP-T1-13** Identify and analyze a complex engineering ethics situation, based on facts, to lead to the most ethical course of action.





- CMP-T1-14** Avoid harming the reputation and employment of others through malicious actions.
- CMP-T1-15** Accord individuals, and the public, the right to know true and real facts, as well as any associated constraints, and provide this information when needed and when relevant.
- CMP-T1-16** Introduce and establish engineering ethics and ethical practices in the workplace.
- CMP-T1-17** Support, encourage, and reward awareness, training, and education of engineering ethics, ethical practices, and the societal impact of the profession.
- CMP-T1-18** Establish mechanisms, and provide resources, such as open protected channels for individuals to seek advice, and report, ethically questionable situations before any harm takes place.

CMP-T2: Professionalism

- CMP-T2-1** Serve each employer and client honestly and impartially.
- CMP-T2-2** Recognize the responsibility of professional engineers to ensure public safety and to follow best practices in preserving natural resources and the environment.
- CMP-T2-3** Demonstrate awareness of responsibilities associated with professional engineering practice in local, regional, and global contexts.
- CMP-T2-4** Separate personal from professional judgement and act impartial and objective. Take responsibility for all actions, including shortcomings and seek help before errors escalate.
- CMP-T2-5** Inform clients and employers when an engineer feels a project will not be successful, or cannot meet accepted engineering practices.
- CMP-T2-6** Abide by all pertinent professional, legal, contractual, and employment obligations, when making engineering decisions.
- CMP-T2-7** Seek input and feedback from teammates and constituents, and provide yours as well, while maintaining mutual respect and integrity of all parties.
- CMP-T2-8** Respect explicit or implied confidentiality obligations while keeping a balance with higher obligations like public interest.
- CMP-T2-9** Be aware of international standards of practice, especially when working for or in other countries; ensure that your designs meet accepted international standards of engineering practice.



- CMP-T2-10** Engage responsibly with community and relevant stakeholders and actively contribute by providing information on the technical elements, within your expertise, of any potential legislation, regulation, or futuristic endeavor to be undertaken by the leadership of the community.
- CMP-T2-11** Inform and involve the clients, community and/or relevant parties in engineering decisions that have consequences on the environment or any natural resources.
- CMP-T2-12** Identify and assess risks associated with any engineering project, inform all potentially affected parties, and provide risk management strategies to minimize the likelihood of any adverse consequences (such as injury or loss of life, major environmental damage, or significant economic loss).
- CMP-T2-13** Limit your performance and judgement to areas of competence and expertise. Avoid misrepresentation or falsification of qualifications or professional experience and inform relevant parties when you receive tasks outside your area of competence.
- CMP-T2-14** Fulfill duties in accordance with the current legal framework and established standards.
- CMP-T2-15** Establish, and educate all involved parties about technical and professional standards, as well as policies and procedures needed to streamline operations, and efficiently carry out responsibilities.
- CMP-T2-16** Deliver effective, honest and timely communication on issues pertinent to engineering services, outcomes, risks and costs.
- CMP-T2-17** Respond to feedback non-defensively and accept responsibilities for own actions.
- CMP-T2-18** Balance conflicting views in order to attain workable solutions.
- CMP-T2-19** Project and maintain a professional image when dealing with clients, colleagues, or professionals across all sectors.
- CMP-T2-20** Earn the trust of your colleagues by modeling a behavior that reflects reliability and dependability.
- CMP-T2-21** Demonstrate the ability to work as a member or leader of multi-disciplinary and diverse teams.
- CMP-T2-22** Provide leadership when needed while respecting the autonomy and expertise of other members on the team.
- CMP-T2-23** Value the diversity of opinions and the importance of scholar's advice in pursuing and discerning professional decisions.

CMP-T2-24 Adopt and engage in lifelong learning and professional development, and encourage the professional development of other members of your profession.

CMP-T3: Laws for Professional Practice, Professional Laws and Regulation

Engineers should have knowledge of the following areas as they apply to engineering practice:

CMP-T3-1 Basic social, heritage and values of Saudi Arabia.

CMP-T3-2 Society leadership strategic plans such as: Saudi Vision 2030, and the overarching principles and impact pertinent to engineering and engineers.

CMP-T3-3 Knowledge of the following Saudi laws and systems:

- Law of protection of heritage in the Kingdom of Saudi Arabia
- Saudi Council of Engineers (SCE)
- The Practice of engineering professions regulating law
- Executive regulations of the Saudi Council of Engineers
- Engineering arbitration regulation
- Government tenders and procurement law
- Environmental law
- Law for activities detrimental to health and environment
- Law of trade names
- Copyright law
- Law of Patents, layout designs of integrated circuits, plant varieties and industrial designs
- Contract and tort law
- Business, employment, and labor law
- Law of criminal procedure
- Competition law
- Regulations governing unethical or incompetent practice
- Regulations governing response to complaints
- Regulations governing the use of seals and stamps

CMP-T4: Environment and Natural Resources

- CMP-T4-1** Demonstrate knowledge of the Saudi environment law.
- CMP-T4-2** Understand the essence of environmental management system.
- CMP-T4-3** Have knowledge of systems of natural resources and environmental conservation, protection, and impact measurement.
- CMP-T4-4** Demonstrate knowledge of the concept of BAT (best available technology).
- CMP-T4-5** Able to carry out Environmental and Social Impact Assessment (ESIA), and incorporate related risk mitigation measures when planning and executing engineering projects.
- CMP-T4-6** Identify direct and indirect as well as short and long term impacts of engineering decisions on individuals, society, and the environment.
- CMP-T4-7** Demonstrate knowledge of how to manage environmental triggers and develop sustainability goals and measures within engineering projects.
- CMP-T4-8** Understand some of the techniques and methods used to assess the impact of engineering projects on the environment and on natural resources such as: reversible, irreversible, and cumulative, as well as source-pathway-receptor model.
- CMP-T4-9** Conduct life-cycle analysis to determine the sustainability dimension of any proposed outcomes in an engineering project, and incorporate actions to preserve and protect natural resources and the environment.



CMP-T5: Engineering Management

- CMP-T5-1** Demonstrate knowledge of management responsibilities, some management models, and related constraints.
- CMP-T5-2** Apply professional engineering concepts and rules, and enable professional engineers to fulfill their professional obligations as well.
- CMP-T5-3** Evaluate objectively, fairly, and impartially, the performance and actions of personnel, showing appreciation for commendable performance and providing guidance and training for low performers.
- CMP-T5-4** Understand the nature of engineering management including management of: resources, personnel, and levels of authority, as well as the characteristics of engineering managers.
- CMP-T5-5** Demonstrate knowledge of the different types of planning and performance monitoring tools, applied to engineering projects, such as: strategic, operational, SWOT analysis, performance benchmarking, KPIs, forecasting, etc.
- CMP-T5-6** Understand diverse organization structures (e.g. functional organization, production-based organization) and delegation.
- CMP-T5-7** Demonstrate knowledge of different leadership and management tools such as: decision making process, motivating, communication and people development
- CMP-T5-8** Establish KPIs based on mutually approved performance standards, and other related indicators for performance monitoring such as: benchmarking, sampling, SPC, evaluation and correction of performance.
- CMP-T5-9** Comprehend how legislative, regulatory, contract law, other common law and professional duties are interrelated to manage a working team for a successful achievement.
- CMP-T5-10** Demonstrate an understanding of the project management body of knowledge and related tools needed to plan, initiate, and monitor an engineering project (e.g. scope definition, assumptions and constraints formulation, identify project risks, perform stakeholder analysis, develop and obtain project charter approval)
- CMP-T5-11** Identify project risks, perform stakeholder analysis, develop and obtain project charter approval, identify requirements, define team roles and responsibilities, create the work breakdown structure, develop change management plan and define risk strategies.
- CMP-T5-12** Demonstrate the ability to close an engineering project (financial, legal and administrative closure, archive and retain project records,



measure customer satisfaction, release project resources, proper documentation)

- CMP-T5-13** Demonstrate knowledge of the different forms of contract, as well as the ability to effectively interact with legal groups for ensuring the performance and efficiency in the delivery of work by consultants or contractors
- CMP-T5-14** Include the principles of business planning and financial management in all phases of execution of engineering projects.
- CMP-T5-15** Understand the concepts of project life cycle assessment.
- CMP-T5-16** Demonstrate awareness of efficiency and quality improvement tools (e.g. Agile management, Six sigma).
- CMP-T5-17** Demonstrate resourcefulness through the efficient identification and implementation of information, resource finding and evaluation, and appropriate resource allocation.
- CMP-T5-18** Understand the reliability, accuracy and confidence of data in decision-based tools.
- CMP-T5-19** Understand concepts of RAMS (reliability, availability, maintainability and safety) in equipment selection and use.
- CMP-T5-20** Understand concepts of digital transformation and its role in equipment selection and use.
- CMP-T5-21** Have awareness of challenges faced by engineering management in the current century (e.g. globalization, knowledge-based economies, impact of technologies).
- CMP-T5-22** Understand the concepts of what-if-analysis using simulation modeling and analysis to initiate, to plan, to conduct several scenarios for an engineering project.
- CMP-T5-23** Understand the concepts of project management software to be able to utilize them to produce efficient plan, reporting...etc.
- CMP-T5-24** Understand the concepts of global project management.
- CMP-T5-25** Understand the concepts of project management office.

CMP-T6: Engineering Economics

- CMP-T6-1** Demonstrate knowledge of fundamentals of engineering economy, investment, and financial resources management.
- CMP-T6-2** Understand asset depreciation and financial, as well as technical measures to ensure optimum asset usage.
- CMP-T6-3** Identify and effectively work with financial resources, economic advisors, and accounting, to accomplish the economic goals associated with an engineering project.
- CMP-T6-4** Have knowledge and be able to apply different engineering economy factors in estimating the capital and on-going costs of engineering projects.
- CMP-T6-5** Understand the concepts of developing business cases using different tools and data (e.g. OPEX and CAPEX).
- CMP-T6-6** Demonstrate an understanding of the concepts of BOTEX (developing baselines and targets of operating costs) and the concepts of Asset evaluation / condition assessments.
- CMP-T6-7** Interpret simple financial statement to measure financial performance.
- CMP-T6-8** Apply different costing techniques in production process.
- CMP-T6-9** Demonstrate knowledge of the basics of a business plan for an engineering project.
- CMP-T6-10** Evaluate investment opportunities, with assistance from appropriately identified experts, and compare between alternatives.
- CMP-T6-11** Perform sensitivity analysis for P and L (profit and loss) under uncertain conditions.

CMP-T7: Health, Safety and Security (HSS)

- CMP-T7-1** Have knowledge of Saudi Arabia standards for health, safety and security, as well as similar standards established by professional organizations.
- CMP-T7-2** Understand the impact of safety regulations, laws, and standards on individuals, employers, and society.
- CMP-T7-3** Understand, comply, and apply laws and regulations related to health, safety, security, and environmental protection in the workplace.
- CMP-T7-4** Identify the direct/indirect consequences and cost of work accidents and security breach, particularly in the area of data and information, on individuals, employers, and society.

- CMP-T7-5** Identify workplace hazards, hazardous areas and activities using established hazard identification methods and techniques.
- CMP-T7-6** Analyze and assess health, safety, and environment components in any given case studies, and/or in the event of accidents and failures.
- CMP-T7-7** Relate safety issues to the design and operation of equipment. Apply similar concepts to projects requiring elevated level of security (e.g. data, national defense industries, etc.).
- CMP-T7-8** Understand risk assessment process, Health Impact Assessment (HIA), and security breach factors, then recommend implementation plans and actions to improve the health, safety, and security of the work environment.
- CMP-T7-9** Recognize and implement suitable mitigation techniques to eliminate or reduce workplace hazards.
- CMP-T7-10** Identify, understand, and train on the corrective actions to be taken during a situation of emergency or disasters in the workplace.
- CMP-T7-11** Identify hazard prevention and control strategies in the workplace and establish contingency plans to manage any emergency situation that may arise.
- CMP-T7-12** Integrate health, safety, environment, security, and social factors into decision-making of relation to engineering projects.
- CMP-T7-13** Demonstrate an understanding of the importance of housekeeping, industrial hygiene and occupational health management.
- CMP-T7-14** Understand safety management and how it is applicable in various stages and types of engineering activities.
- CMP-T7-15** Understand HSS safeguarding and compliance.

Suggested Study Materials for Examinees **(not provided during exam)**

1. Code of ethics of the Saudi Council of Engineers and any other codes of ethics (such as the NSPE code of ethics).
2. Saudi law regulating the practice of engineering professions
3. Saudi Environmental law
4. Saudi Government Tender and Procurement Law
5. Saudi Law of Patents, Layout Designs of Integrated Circuits, Plant Varieties, and Industrial Designs
6. Saudi National Strategic Program for Occupational Safety and Health

5. Sample Questions

Q. No.	Major Area	Indicator Code	Question Statement (Answer's Choices)	Key Answer	Expected Time (min)	Supplied Reference
1	Ethics	CMP-T1-5	In some situations, as a professional engineer, you cannot avoid a conflict of interest. In this case, the best course of action is to: A) $h=0.24$ m B) $h=0.759$ m C) $h=1.0$ m D) $h=1.76$ m	B	1.0-2.0	None
2	Ethics	CMP-T1-9	What will constitute a fraudulent contractual misrepresentation by a certain engineer? A) If he/she unintentionally gives incorrect information about a part of a contract. B) If he/she is forced by intimidation to sign a contract. C) If he/she is induced to sign an unfair contract. D) If he/she makes false statements to lure another party to sign a contract.	D	1.0-2.0	None
3	Professionalism	CMP-T2-3	Among the following list, what is not a characteristic of professionalism? A) Two years in any part of the world B) Two years in Saudi Arabia only C) Three years in Saudi Arabia and other GCC countries D) Three years in any part of the world	C	1.0-2.0	None
4	Laws for Professional Practice, Professional Laws and Regulation	CMP-T3-3	The Saudi Patents Law stipulates that an application for registration of a layout design of an integrated circuit may be filed, if the design has not been commercially exploited before or was subject to commercial exploitation for a period not exceeding ---. A) Two years in any part of the world B) Two years in Saudi Arabia only C) Three years in Saudi Arabia and other GCC countries D) Three years in any part of the world	A	1-2	None
5	Environmet and Natural Resources	CMP-T4-5	The Environmental Impact Assessment (EIA) is a procedure that ensures that: A) environmental consequences of any decisions are taken into consideration when evidences of such impact arise during the execution of an activity. B) environmental impacts of any decisions are taken into consideration	C	1.0-2.0	None

Q. No.	Major Area	Indicator Code	Question Statement (Answer's Choices)	Key Answer	Expected Time (min)	Supplied Reference
			<p>after the government environmental authority grants a permit.</p> <p>C) environmental impacts of decisions are taken into consideration before the decisions are made.</p> <p>D) environmental impacts of all the project activities are dealt with after the completion of the project.</p>			
6	Engineering Management	CMP-T5-11	<p>What serves as the foundation for establishing entrance and exit criteria for various phases of a project?</p> <p>A) Project Schedule.</p> <p>B) Work Breakdown Structure.</p> <p>C) Scope Statement.</p> <p>D) Project Charter.</p>	B	1.0-2.0	None
7	Engineering Management	CMP-T5-15	<p>Which phase of the Life Cycle Assessment (LCA) deals with the compiling of relevant energy and material inputs and environmental releases?</p> <p>A) Inventory analysis.</p> <p>B) Goal and scope definition.</p> <p>C) Interpreting the results.</p> <p>D) Impact assessment.</p>	A	1.0-2.0	None
8	Engineering Economics	CMP-T6-2	<p>A new machine was purchased with a price of \$200,000. It has an estimated realizable value of \$20,000 after 10 years. The expected profit from investment in the machine is \$22,000 per year. Considering a net of straight-line depreciation, the payback period (in years) of the investment in the machine is:</p> <p>A) 5.0</p> <p>B) 3.0</p> <p>C) 2.5</p> <p>D) 1.5</p>	A	2.0 – 3	None
9	Health, Safety and Security (HSS)	CMP-T7-9	<p>Which of the following options would be the best to control hazards in the workplace?</p> <p>A) Implement safe work procedures.</p> <p>B) Substitute the hazard with a less risky one.</p> <p>C) Educate and train employees.</p> <p>D) Use personal protective equipment.</p>	B	1.0 – 2.0	None
10	T11. Hazard	CMP-T7-1	<p>The following sign is posted on the package of a substance. Based on this pictogram, the substance is:</p>	B	1.0-2.0	None



Q. No.	Major Area	Indicator Code	Question Statement (Answer's Choices)	Key Answer	Expected Time (min)	Supplied Reference
	Prevention and Control		 <p>A) Corrosive. B) Oxidizing. C) Highly flammable. D) Toxic.</p>			
Essay 1	Ethics	CMP-T1	<p>Ahmad is an engineer working full time with a company that performs consulting services in the water analysis sector. Ahmed has set up his own practice that performs services similar to his company. Ahmed work, including the contact with the clients, is done during his own free time using his equipment and materials. Ahmed does not make any attempt to lure the existing company clients to seek services from his practice. The contract signed by Ahmed with his company does not contain any policy regarding employees performing services outside their work time. Therefore, Ahmed does not see any reason to advice the company of his outside practice.</p> <p>Discuss the ethical issues in Ahmed performing such practice in the manner indicated?</p>	----	30	None

6. Solutions of Sample Questions

Multiple Choice Questions (MCQs)

Question # 1

Indicator CMP-T1-5 Divulge any real or perceived conflict of interest to relevant parties and avoid any situation through which they may arise.

Example CMP-T1-5

In some situations, as a professional engineer, you cannot avoid a conflict of interest. In this case, the best course of action is to:

- A) ignore completely the conflict of interest.
- B) disclose the matter to your supervisor and all stakeholders.
- C) not disclose the conflict of interest to anyone but try to minimize its effects on your decisions.
- D) disclose the conflict to your colleague(s) and ask for advice.

Solution CMP-T1-5

Conflict of interest real or perceived should be always disclosed to the employer and all stakeholders.

Answer: (B)

Question # 2

Indicator CMP-T1-9: Follow all legal regulations very closely and avoid any actions which may be otherwise such as: corrupt, fraudulent or deceptive conduct. In addition, understand the need for immediate reporting when faced with, or knowing of, such situations.

Example CMP-T1-9:

What will constitute a fraudulent contractual misrepresentation by a certain engineer?

- A) If he/she unintentionally gives incorrect information about a part of a contract.
- B) If he/she is forced by intimidation to sign a contract.
- C) If he/she is induced to sign an unfair contract.
- D) If he/she makes false statements to lure another party to sign a contract.

Solution CMP-T1-9

Making knowingly false information to induce a contract is a fraudulent act

Answer: (D)



Question # 3

Indicator CMP-T2-3 Demonstrate awareness of responsibilities associated with professional engineering practice in local, regional, and global contexts.

Example CMP-T2-3

Among the following list, what is not a characteristic of professionalism?

- A) Morality.
- B) Responsibility.
- C) Complacency.
- D) Accountability.

Solution CMP-T2-3:

Complacency is not a characteristic of professionalism

The answer is: (C)



Question # 4

Indicator CMP-T3-3: Knowledge of Saudi laws and systems

Example CMP-T3-3

The Saudi Patents Law stipulates that an application for registration of a layout design of an integrated circuit may be filed, if the design has not been commercially exploited before or was subject to commercial exploitation for a period not exceeding ---.

- A) Two years in any part of the world
- B) Two years in Saudi Arabia only
- C) Three years in Saudi Arabia and other GCC countries
- D) Three years in any part of the world

Solution CMP-T3-3

According to the article 49 Chapter Three of Provisions Governing Layout Designs of Integrated Circuits " An application for registration of a layout design of an integrated

circuit may be filed, if the design has not been commercially exploited before or was subject to commercial exploitation for a period not exceeding two years in any part of the world".

The answer is: (A)

Question # 5

Indicator CMP-T4-5 Able to carry out Environmental and Social Impact Assessment (ESIA), and incorporate related risk mitigation measures when planning and executing engineering projects.

Example CMP-T4-5

The Environmental Impact Assessment (EIA) is a procedure that ensures that:

- A) environmental consequences of any decisions are taken into consideration when evidences of such impact arise during the execution of an activity.
- B) environmental impacts of any decisions are taken into consideration after the government environmental authority grants a permit.
- C) environmental impacts of decisions are taken into consideration before the decisions are made.
- D) environmental impacts of all the project activities are dealt with after the completion of the project.

Solution CMP-T4-5

The purpose of EIA is to determine possible impacts before any decisions are made.

The answer is : (C)

Question # 6

Indicator CMP-T5-11

Identify project risks, perform stakeholder analysis, develop and obtain project charter approval, identify requirements, define team roles and responsibilities, create the work breakdown structure, develop change management plan and define risk strategies.

Example CMP-T5-11:

What serves as the foundation for establishing entrance and exit criteria for various phases of a project?

- A) Project Schedule.
- B) Work Breakdown Structure.
- C) Scope Statement.
- D) Project Charter.

Solution CMP-T5-11

The Project Management Body of Knowledge defines the work breakdown structure as a "deliverable oriented hierarchical decomposition of the work to be executed by the project team."

The answer is : (B)

Question # 7

Indicator CMP-T5-15 Understand the concepts of project life cycle assessment.

Example CMP-T5-15:

Which phase of the Life Cycle Assessment (LCA) deals with the compiling of relevant energy and material inputs and environmental releases?

- A) Inventory analysis.
- B) Goal and scope definition.
- C) Interpreting the results.
- D) Impact assessment.

Solution CMP-T5-15

Inventory analysis is the phase that deals with the identification and quantification of materials and energy needs as well as environmental releases

The answer is : (A)

Question # 8

Indicator CMP-T6-2 Understand asset depreciation and financial, as well as technical measures to ensure optimum asset usage

Example CMP-T6-2

A new machine was purchased with a price of \$200,000. It has an estimated realizable value of \$20,000 after 10 years. The expected profit from investment in the machine is \$22,000 per year. Considering a net of straight-line depreciation, the payback period (in years) of the investment in the machine is:

- A) 5.0
- B) 3.0
- C) 2.5
- D) 1.5

Solution CMP-T6-2:

Straight-line depreciation is $[(\$200,000 \text{ investment} - \$20,000 \text{ residual value}) \div 10 \text{ years}] = \$18,000$ per year.

Annual cash inflow is \$40,000 (\$22,000 profit + \$18,000 depreciation).

The payback period is $(\$200,000 \div \$40,000) = 5$ years

The answer is : (A)



Question # 9

Indicator CMP-T7-9 Recognize and implement suitable mitigation techniques to eliminate or reduce workplace hazards.

Example CMP-T7-9:

Which of the following options would be the best to control hazards in the workplace?

- A) Implement safe work procedures.
- B) Substitute the hazard with a less risky one.
- C) Educate and train employees.
- D) Use personal protective equipment

Solution CMP-T7-9

Substitution is the best course of action among all the given options.

The answer is : (B)

Question # 10

Indicator CMP-T7-1 Have knowledge of Saudi Arabia standards for health, safety and security, as well as similar standards established by professional organizations

Example CMP-T7-1:

The following sign is posted on the packaging of a substance. Based on this pictogram, the substance is:



- A) Corrosive.
- B) Oxidizing.
- C) Highly flammable
- D) Toxic

Solution CMP-T7-1:

The above sign is for oxidizing compounds as set by the Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

The answer is : (B)

Essay Question #1

Indicator CMP-T1: Ethics

Ahmad is an engineer working full time with a company that performs consulting services in the water analysis sector. Ahmed has set up his own practice that performs services similar to his company. Ahmed work, including the contact with the clients, is done during his own free time using his equipment and materials. Ahmed does not make any attempt to lure the existing company clients to seek services from his practice. The contract signed by Ahmed with his company does not contain any policy regarding employees performing services outside their work time. Therefore, Ahmed does not see any reason to advice the company of his outside practice.

Discuss the ethical issues in Ahmed performing such practice in the manner indicated?

Answer CMP-T1:

The answer should indicate the list of moral infractions (if they exist) that breach the code of ethics, brain storm solutions and choose the optimal answer based on weighting important principles.

Some points:

- Ahmed is acting ethical by doing work only on his own time, using his own equipment, and not luring existing company clients to his practice.
- There is no contract that forbids company employees from performing services in the area of the company
- However, there is a high risk for a conflict of interest.
- Ahmed should first and foremost consult with his company.



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