KCG College of Technology

Department of Electronics & Communication Engineering

Second Year / Third Semester

23HS301_UNIVERSAL HUMAN VALUES AND ETHICS

Question Bank

UNIT IV ENGINEERING ETHICS

Q.No	Part - A	CO's	Bloom's Level
1.	Define engineering ethics? Engineering ethics may be defined as the identification, study and resolution of ethical problems occurring in the practice of the engineering profession.	CO5	K1
2.	What is the need for engineering ethics? • Stimulating the moral imagination • Recognizing ethical issues • Developing analytical skills • Drawing out sense of responsibility • Addressing unclarity, uncertainty and disagreement.	CO5	K1
3.	What do you understand by "Balanced outlook on Law"? The "balanced outlook on law" in engineering practice stresses the necessity of laws and regulations and also their limitations in directing and controlling the engineering practice.	CO5	K1
4.	What are moral Dilemma? Moral dilemmas are situations in which moral reasons come into conflict, or in which the application of moral values are problems, and one is not clear of the immediate choice or solution of the problems.	CO5	K1
5.	Outline two methods that can be applied when testing is appropriate. • Scenario analysis • Failure modes and effects analysis • Fault-tree analysis • Even-tree analysis	CO5	K2
6.	Define the term moral autonomy Moral autonomy is defined as, decisions and actions exercised on the basis of moral concern for other people and recognition of good moral reasons.	CO5	K1
7.	List the theories of right action. Utilitarian theory (Act and Rule utilitarian), Duty ethics theory, The rights theory, The virtue theory, Self-realization theory, Justice (fairness) theory.	CO5	K1
8.	What are the merits of moral autonomy? • The moral autonomy relates to the individual ideas whether right or wrong conduct which is independent of ethical issues. • The concept of moral autonomy helps in improving self-determination. • Moral Autonomy is concerned with independent attitude of a person related to moral/ethical issues	CO5	K1

9.	Explain the uses of ethical theories. •In understanding moral dilemma. They provide clarity, consistency, systematic and comprehensive understanding • It provides helpful practical guidance in moral issues towards the solution • Are useful in expressing everyday moral experience and justifying the professional morality	CO5	K2
10.	Explain the importance of ethical theories. • In understanding moral dilemma. They provide clarity, consistency, systematic and comprehensive understanding • It provides helpful practical guidance in moral issues towards the solution • Are useful in expressing everyday moral experience and justifying the professional morality	CO5	K2
11.	Outline Kohlberg's theory. According to Kohlberg, the people progressed in their moral reasoning through a series of stages. His theory is based on the foundation that morality is a form of reasoning that develops in structural stages. The three levels of moral development suggested by Kohlberg are: ▪ Pre-conventional level ▪ Conventional level ▪ Post-conventional level	CO5	K2
12.	Outline Gilligan's theory. According to Gilligan theory, males have a tendency to over-ride the importance of moral rules and conviction while resolving moral dilemmas; whereas females have a tendency to try hard to preserve personal relationship with all people involves in a situation.	CO5	K2
13.	What is meant by consensus? Consensus means "General agreement". Example: The consensus of the universities is that they should conduct university examination twice in a year.	CO5	K1
14.	List the advantages of industrial standards. Standards help manufacturers reduce costs, anticipate technical requirements, and increase productive and innovative efficiency. The positive effects of industrial standards in area such as trade, the creation of Single Market for products and services, and innovation.	CO5	K1
	Part – B		
1.	Explain the senses of 'Engineering Ethics' and the variety of moral issues engineers might face. Senses of Engineering Ethics 1. Preventive Ethics: Engineers are expected to anticipate and prevent harm to society, environment, or individuals through their designs and projects. This includes addressing potential risks and minimizing negative impacts. Example: Ensuring the safety of a bridge design so that it won't collapse under heavy load. 2. Aspirational Ethics: Engineers are encouraged to strive for excellence and uphold the highest ethical standards, going beyond mere legal compliance to contribute positively to society. Example: Designing eco-friendly products that reduce environmental impact, even if not required by law. 3. Prohibitive Ethics: This involves clear prohibitions against harmful	CO5	K2

	practices such as fraud, corruption, or knowingly producing faulty designs that could endanger people. Example: Avoiding the use of substandard materials in construction to cut costs, even under pressure from a client. 4. Responsibility for Safety and Health: Engineers have an ethical duty to ensure that their work does not compromise the safety, health, or welfare of the public. Example: Ensuring that a chemical plant operates within safe emission limits to avoid harming nearby residents. 5. Professional Conduct: Engineering ethics also involve maintaining integrity in professional relationships by adhering to standards of honesty, trust, and transparency. Example: Being honest about one's qualifications and experience when taking on a project, and not overstating capabilities. Variety of Moral Issues Engineers Might Face 1. Safety vs. Cost: Engineers often have to balance safety with budget constraints. There can be pressure to reduce costs, which might lead to compromises in safety. Example: Deciding whether to use cheaper materials that may have a shorter lifespan or be less reliable, posing potential risks in the long run. 2. Environmental Impact: Engineers must often make decisions that involve the environmental sustainability of their designs and projects. The challenge is balancing progress with environmental protection. Example: Designing an industrial plant that might pollute local water sources, and deciding how to reduce emissions without increasing costs significantly. 3. Intellectual Property and Plagiarism: Engineers may face ethical dilemmas related to the ownership of ideas, designs, and inventions. The misuse of others' work without proper acknowledgment is a common issue. Example: Using patented technology without permission in a new product or project, potentially leading to legal and ethical problems. 4. Whistleblowing: Engineers may encounter situations where they need to report unethical or dangerous practices by their company or colleagues, often at the risk of losing their job. Example: Reporting that a construction company is using inferior materials that could result in a structural failure, despite potential backlash from management. 5. Conflicts of Interest: Engineers might face conflicts between their duty to the public and loyalty to their employer or client, especially when profit motives interfere with ethical standards. Example: Being asked by a client to approve a design that doesn't meet safety regulations but would save time and money. 6. Honesty in Reporting Data: Engineers have a duty to provide accurate and truthful data in reports and documentation, even when the results aren't favorable. Example: Manipulating data to make a project look more successful than it actually is, in order to secure further funding or approval. 7. Privacy and Security: With the rise of digital technologies, engineers in fields like software, AI, and data analysis face issues regarding the privacy and security of user information. Example: Designing a system that collects user data for a company, but		

	knowing that the data could be misused or lead to privacy violations. 8. Fairness and Equal Opportunity: Engineers may encounter moral questions around fairness in hiring practices, promotions, and how they treat colleagues or workers on projects. Example: Ensuring that job opportunities and project participation are distributed equitably, without discrimination based on gender, race, or other factors. 9. Dealing with Uncertainty: Engineers often work in conditions where complete information isn't available. Deciding how to proceed when outcomes are uncertain can present ethical dilemmas. Example: Choosing whether to proceed with a design that hasn't been fully tested under extreme conditions but has tight deadlines.		
2.	Explain the different types of inquiry in engineering ethics and how they are used to address moral dilemmas. Types of Inquiry in Engineering Ethics 1. Normative Inquiry Definition: Normative inquiry focuses on identifying and evaluating what ought to be done in moral situations. It explores ethical standards, principles, and rules that engineers should follow when facing moral dilemmas. Questions Asked: - What is the morally right action in this situation? - What principles should guide engineers in making decisions? Usage: Normative inquiry helps to set moral standards, such as professional codes of ethics, to guide engineers' actions and decision-making. 2. Conceptual Inquiry Definition: Conceptual inquiry clarifies the meaning of key concepts and ideas used in ethical discussions. It ensures that everyone involved has a clear understanding of important terms like "safety," "risk," "responsibility," and "public welfare." Questions Asked: - What does "public safety" mean in this context? - How should we define "risk" when designing this product? Usage: Conceptual inquiry ensures that engineers and stakeholders have a shared understanding of important terms before making ethical decisions. 3. Factual (or Descriptive) Inquiry Definition: Factual inquiry investigates the facts and data related to an ethical dilemma. It involves gathering empirical information about the situation to understand the context and technical details that are relevant to making an ethical decision. Questions Asked: - What are the potential risks associated with this design? - How many people could be affected by the failure of this system? Usage: Factual inquiry ensures that engineers base their decisions on accurate, real world information rather than assumptions or incomplete data. How These Types of Inquiry Address Moral Dilemmas When engineers face moral dilemmas, these types of inquiry help them approach the problem from different angles, ensuring that their decisions are	CO5	K2

	thoughtful, informed, and ethical. Here's how they work together to address such dilemmas: 1. Clarifying the Problem (Conceptual Inquiry): Before engineers can make a decision, they need to understand the ethical terms involved. For instance, if there's a question about "public safety," conceptual inquiry helps engineers define what that means in their specific context. It provides clarity on the key issues so that the decision-making process is based on clear and shared definitions. 2. Understanding the Facts (Factual Inquiry): Once the terms are clear, factual inquiry helps engineers gather all the relevant data about the situation. This includes understanding the potential risks, the impact of their decisions, and the technical realities of the project. Accurate information is crucial to making an informed and responsible ethical decision. - For example, if an engineer is tasked with determining whether to launch a product that might have safety concerns, factual inquiry helps in gathering evidence on the potential risks, failure rates, and effects on users. 3. Determining the Right Course of Action (Normative Inquiry): After understanding the facts and defining the concepts, normative inquiry helps engineers figure out what **ought** to be done. It involves evaluating the situation against ethical standards and determining which action is morally right. This inquiry focuses on the principles of safety, honesty, public welfare, and environmental responsibility. - For example, if the data reveals that a certain design poses a safety risk, normative inquiry will guide engineers to prioritize public safety and halt the project until the issue is resolved, even if there are financial pressures to proceed. Example of Using All Three Inquiries Together An engineer discovers that a product they are developing has a minor flaw that could, in rare circumstances, cause harm to users. The product is close to being launched, and there is pressure from management to release it on time to avoid financial losses. 1. Conceptual Inquiry: The engineer first needs to clarify the meaning of terms like "minor flaw" and "harm." What level of risk is acceptable, and how is "harm" defined in this context? Is harm limited to physical injury, or does it also include financial or emotional harm to the users? 2. Factual Inquiry: The engineer gathers all the data related to the flaw. How often does the flaw occur? What is the probability of it causing harm? How many users might be affected? This factual inquiry provides a concrete understanding of the potential consequences of launching the product as-is. 3. Normative Inquiry: Finally, the engineer uses normative inquiry to evaluate the ethical implications of launching the product. Should the company prioritize profits over user safety? What ethical standards should guide the decision? The engineer might conclude that public safety should take priority and recommend delaying the launch to fix the flaw, based on ethical guidelines from professional codes of conduct.		
3.	Relate moral autonomy in the context of engineering with Kohlberg's theory of moral development. Moral autonomy in engineering refers to an engineer's ability to make ethical decisions independently, guided by their own sense of right and wrong rather than blindly following external rules or pressures. It emphasizes an engineer's personal responsibility in making ethical choices, especially in complex situations where	CO5	K2

regulations, company policies, or instructions from superiors may not align with broader ethical principles like safety, justice, and environmental stewardship. This concept of moral autonomy can be closely related to Lawrence Kohlberg's theory of moral development, which provides a framework for understanding how individuals evolve in their capacity to make ethical decisions.

Kohlberg's theory outlines three major levels of moral development, each of which reflects a different approach to moral reasoning. These levels are:

Pre-conventional Level:
Obedience and Punishment Orientation: At this stage, individuals follow rules to avoid punishment. Ethical decisions are made based on the direct consequences of actions, rather than on any intrinsic sense of morality.
Individualism and Exchange (Self-Interest): Moral decisions are based on self-interest and the idea of "what's in it for me." An individual might act ethically if they see a personal benefit from doing so.
In the context of engineering, an engineer operating at the pre-conventional level might follow rules or guidelines merely to avoid punishment or negative consequences, such as legal repercussions or job loss. For instance, they may comply with safety regulations not because they believe in their moral necessity, but to avoid penalties or lawsuits. Similarly, decisions may be driven by personal gain, such as promotions or bonuses, without considering the broader impact on public safety or the environment.

Conventional Level:
Good Interpersonal Relationships (Social Approval): Individuals at this stage make ethical decisions based on social approval and the desire to maintain good relationships. They value being seen as "good" by others, which drives them to follow norms and rules.
Maintaining Social Order (Law and Order): At this stage, individuals view morality as upholding laws, authority, and social systems. They believe that maintaining order is crucial, and they follow rules not just for approval but because they see them as necessary for the functioning of society.
Engineers at the conventional level are likely to follow laws, company policies, or instructions from superiors without necessarily questioning their ethical implications. For example, an engineer might agree to implement cost-cutting measures that could compromise safety because they are following company directives or maintaining social norms. While these engineers may not exercise moral autonomy, they are seen as responsible for following established procedures and ensuring conformity with legal requirements and organizational standards.

Post-conventional Level:
Social Contract and Individual Rights: Individuals at this stage recognize that rules and laws are important, but they also understand that they may need to be changed or questioned if they conflict with human rights, justice, or the greater good. They prioritize the rights and welfare of individuals above strict obedience to laws.
Universal Ethical Principles: This is the highest level of moral reasoning, where individuals make decisions based on self-chosen ethical principles, such as justice,

equality, and respect for human dignity. These principles are considered universal, meaning they apply to everyone, regardless of laws or social contracts.
Engineers at the post-conventional level exhibit true moral autonomy. They critically evaluate the ethical implications of their actions, considering principles of justice, public safety, and human rights. For example, an engineer may refuse to approve a design or project that could put lives at risk, even if it means going against company policies or facing personal or professional consequences. Such engineers demonstrate moral courage by standing up for ethical principles that transcend rules and authority. Their decisions are based on a deeper understanding of moral values and a commitment to broader societal and ethical concerns, such as sustainability and fairness.

Application of Kohlberg’s Theory to Moral Autonomy in Engineering
Engineers at different stages of Kohlberg's moral development exhibit varying degrees of moral autonomy.

Pre-conventional engineers tend to lack moral autonomy, as their ethical decisions are driven by external consequences like punishment or personal gain. These engineers may comply with ethical standards when there is a clear benefit to them, but they are unlikely to act out of a deeper sense of responsibility.

Conventional engineers exhibit limited moral autonomy. They follow rules and laws because they believe it is the right thing to do or because they seek approval from society or superiors. While they may act ethically, their decisions are often influenced by external expectations rather than their own moral convictions.

Post-conventional engineers are the epitome of moral autonomy. They make ethical decisions based on universal principles, even if it requires challenging authority or societal norms. These engineers weigh the broader impact of their work on public welfare, justice, and the environment. They are capable of making difficult ethical choices, such as delaying a project or advocating for safety measures, even when such actions might carry personal or professional risks.

For instance, an engineer at the post-conventional level might choose to halt the production of a product if they believe it poses a significant safety hazard, despite pressure from the company to proceed in the interest of profits. In contrast, an engineer at the conventional level might comply with the company’s directive, assuming that since the company has approved the project, it must be ethically acceptable.

Moral autonomy involves the ability to make independent ethical decisions that prioritize the well-being of society, the environment, and future generations. Kohlberg’s theory of moral development provides a valuable framework for understanding how engineers can progress from simply following rules to making ethically autonomous decisions grounded in justice, rights, and universal principles. Engineers operating at the post-conventional level embody moral autonomy by critically assessing their responsibilities and making decisions based on broader ethical considerations, even when faced with external pressures or risks.

4.	Contrast the concepts of consensus and controversy in engineering ethics. Explain how they affect decision-making. Consensus in Engineering Ethics Definition: Consensus occurs when all or most stakeholders (engineers, clients, regulatory bodies, the public) agree on the ethical course of action or solution to a problem. Impact on Decision-Making: Streamlined Decision-Making: When there is consensus, decisions can be made quickly and efficiently because there is broad agreement on the ethical principles or technical solutions involved. This leads to smoother project execution. Clear Ethical Standards: Consensus typically emerges when ethical standards or values are widely accepted, such as prioritizing safety or environmental sustainability. For example, engineers working on renewable energy projects often find consensus on the ethical importance of reducing carbon emissions. Reduced Conflict: With consensus, there is less debate or conflict over the ethical approach, allowing for a more collaborative work environment and faster resolution of challenges. Controversy in Engineering Ethics Definition: Controversy arises when stakeholders disagree about the ethical course of action. This disagreement can stem from conflicting values, interests, or priorities (e.g., cost vs. safety, environmental protection vs. economic development). Impact on Decision-Making: Slower, More Complex Decision-Making: Controversy often leads to prolonged discussions and debates, as different parties advocate for their positions. Engineers may need to engage in negotiations or seek compromises. Critical Ethical Reflection: Controversy forces deeper ethical examination and consideration of different perspectives. This can lead to more comprehensive decision making, as engineers must weigh trade-offs and think critically about the long-term implications of their choices. Potential for Innovation or Deadlock: While controversy can encourage innovative solutions that balance competing interests, it can also lead to decision paralysis if parties cannot reach a common ground, delaying or halting project progress. Consensus promotes smoother and faster decision-making, while controversy encourages more nuanced and critical thinking. Both influences how engineers resolve ethical dilemmas and balance stakeholder interests.	CO5	K2
5.	Outline the models of professional roles and theories about right action. Show how these models guide ethical behaviour in engineering. Models of Professional Roles in Engineering: 1. Savior Model: Engineers prioritize public safety and welfare above all. This model emphasizes the engineer's responsibility to prioritize public safety, often putting ethical obligations above personal, financial, or organizational interests. Engineers should advocate for solutions that prevent harm to people and the environment.	CO5	K2

2. Guardian Model: Engineers act as trustees or guardians of public interests, holding specialized knowledge and applying it responsibly for the benefit of society.
Engineers must exercise sound judgment, transparency, and integrity in decision-making, ensuring that technical solutions align with societal values and welfare.
3. Bureaucratic Servant Model: Engineers follow organizational rules but balance ethical responsibilities.
Engineers under this model must balance loyalty to their employer with their ethical obligations, ensuring that compliance with regulations does not overshadow ethical concerns like safety and fairness.
4. Social Servant Model: Engineers address broader social issues using their expertise.
This model encourages engineers to be socially conscious, considering broader social impacts and sustainability. Engineers are responsible for using their skills to promote justice and equity.
5. Professional Autonomous Model: Engineers act independently based on ethical standards, resisting external pressures.
Engineers are expected to maintain independence in decision-making, prioritizing professional integrity and ethical standards, even when facing pressure from clients or employers.

Theories About Right Action:
1. Utilitarianism: Focuses on outcomes; engineers aim for the greatest good for the most people.
Example: An engineer designing a transportation system might prioritize designs that benefit the most people, even if it requires a higher initial cost.
2. Deontology: Emphasizes duty and following ethical rules regardless of consequences.
Example: An engineer refusing to approve a project that violates safety codes, even if doing so delays production and incurs financial losses.
3. Virtue Ethics: Engineers act based on moral virtues like integrity and responsibility.
Example: An engineer going beyond minimal safety standards to ensure that their design is as robust and reliable as possible, driven by a personal commitment to excellence and safety.
4. Rights-Based Ethics: Engineers respect the rights of all stakeholders (e.g., safety, privacy).
Example: Ensuring that a new product respects users’ privacy rights by incorporating strong data protection features.
5. Care Ethics: Focuses on care and responsibility in relationships, ensuring decisions consider others’ well-being.
Example: Taking extra care to ensure that a building design considers accessibility for people with disabilities.

How These Models Guide Engineers:
Professional Duties: Engineers balance responsibilities to the public, employer, and society.
Ethical Theories: Provide frameworks for decision-making, whether focusing on outcomes (utilitarianism) or principles (deontology).
Personal Integrity: Virtue ethics encourages engineers to act with moral

	character, ensuring thoughtful, ethical choices. These models and theories help engineers navigate ethical challenges while ensuring public welfare and professional integrity.		
6.	Explain the influence of self-interest, customs, and religion on ethical decision-making in engineering. Illustrate how engineers can use ethical theories to navigate these influences. In engineering ethics, ethical decision-making can be influenced by factors like self-interest, customs, and religion. These factors shape an engineer's perspective but can sometimes create conflicts with professional ethical standards. Ethical theories help engineers navigate these influences to make sound decisions. Influence of Self-Interest: Description: Self-interest refers to personal gains, such as financial rewards, career advancement, or reputation. Engineers might face pressure to prioritize their interests over ethical responsibilities. Example: An engineer may be tempted to approve a flawed design to meet deadlines and receive a bonus, even if it compromises safety. How Ethical Theories Help: Deontology: Emphasizes following ethical duties (e.g., public safety) over personal gain, helping engineers act responsibly despite personal incentives. Virtue Ethics: Encourages engineers to act with integrity, prioritizing long-term character development over short-term rewards. Influence of Customs: Description: Customs are societal norms and practices that influence behavior. Engineers may face ethical dilemmas when local customs conflict with global ethical standards. Example: In some cultures, bribery may be a customary practice, but it conflicts with ethical guidelines. How Ethical Theories Help: Rights-Based Ethics: Focuses on respecting universal human rights, guiding engineers to reject customs like bribery that violate fairness and integrity. Utilitarianism: Helps engineers evaluate the broader impact of following customs, ensuring actions align with the greatest good for society rather than merely conforming to norms. Influence of Religion: Description: Religion shapes moral values and behavior based on religious beliefs. Religious views can sometimes align with or conflict with professional ethical standards. Example: An engineer's religious beliefs might oppose certain types of technology (e.g., genetic engineering), leading to conflicts in ethical decision making. How Ethical Theories Help: Care Ethics: Emphasizes empathy and consideration of others’ wellbeing, allowing engineers to balance personal religious beliefs with professional duties. Deontology: Encourages engineers to follow professional codes of ethics, ensuring that personal religious views do not compromise their obligations to public safety or fairness.	CO5	K2

7.	Explain Gilligan’s theory of moral development. Compare how this theory differs with Kohlberg’s theory. Gilligan’s theory of moral development presents a contrasting perspective to Kohlberg’s justice-based framework by emphasizing an ethic of care. Carol Gilligan, a feminist psychologist, critiqued Lawrence Kohlberg's theory of moral development, which she believed overlooked the moral experiences of women. While Kohlberg focused on justice, rights, and abstract principles of morality, Gilligan’s theory emphasizes relationships, empathy, and care for others as the foundation for moral development. Gilligan’s Theory of Moral Development Gilligan proposed that moral development progresses through three stages that focus on an evolving sense of care and responsibility: Self-Care (Care for One's Own Needs): In this initial stage, individuals primarily focus on their own needs and survival. The moral decisions made at this stage are centered on self-preservation and fulfilling personal desires. There is little consideration for how one's actions might affect others. For example, an engineer operating at this level might prioritize their own success or personal gain over the impact of their decisions on others or society. They may take shortcuts in a project to meet a deadline without considering how those decisions could lead to safety issues for the users. Care for Others (Responsibility to Others): In the second stage, individuals become aware of their responsibilities towards others and begin to make moral decisions based on empathy and care. They recognize the importance of relationships and how their actions affect those around them. Engineers in this stage might prioritize the well-being of others over self-interest, ensuring that their projects are safe, ethical, and beneficial to the public. For example, an engineer might choose to implement safety features in a product design even if it increases costs because they feel responsible for the safety and welfare of the users. Integrated Care (Balance Between Care for Self and Others): At the highest level of moral development, individuals learn to balance their own needs with the needs of others, integrating a sense of care for both self and others. This stage represents a mature understanding of relationships, where moral decisions are made considering the well-being of all stakeholders, not just one party. Engineers at this stage are capable of finding solutions that benefit everyone, ensuring that the needs of the public, clients, and the environment are met, while also taking care of their own professional responsibilities. For instance, an engineer might advocate for sustainable practices in a project that meet environmental standards while ensuring the project's profitability and technical feasibility. Key Aspects of Gilligan's Theory Ethic of Care: Central to Gilligan's theory is the emphasis on care, compassion, and the importance of human relationships. Moral decisions are seen as grounded in empathy and the desire to maintain harmony in relationships.	CO5	K2

	Relational Responsibility: In contrast to Kohlberg's focus on individual rights and justice, Gilligan argues that moral maturity involves understanding the interconnectedness of people and taking responsibility for others' well-being. Contextual Moral Reasoning: Gilligan's theory acknowledges that moral decisions are often context-dependent and should be guided by relationships and specific situations, rather than by applying universal rules or principles. Comparison: How Gilligan's Theory Differs from Kohlberg's Theory Ethic of Care vs. Ethic of Justice: Gilligan's Ethic of Care: Gilligan believes that moral development is rooted in empathy, relationships, and care for others. She argues that moral decisions should prioritize the well-being of individuals and the responsibilities that come with interpersonal relationships. Engineers who adopt this perspective might focus on ensuring that their projects do no harm, especially to vulnerable populations, and prioritize safety and sustainability over profits or strict rule adherence. Kohlberg's Ethic of Justice: Kohlberg, on the other hand, focuses on justice, rights, and abstract moral principles. He emphasizes universal ethical standards like justice, fairness, and equality, which should guide moral decisions. Engineers influenced by this approach would focus on ensuring that their actions align with universally accepted ethical principles, such as upholding public safety, fairness, and social justice, even if it means challenging organizational directives. Moral Reasoning Stages: Gilligan's Stages: Gilligan's stages of moral development reflect an evolving capacity to care for others. She starts with self-care, progresses to care for others, and ultimately arrives at a balance of caring for both self and others. This evolution mirrors the growing complexity of moral reasoning as individuals learn to integrate the needs of various stakeholders in their decision-making. Kohlberg's Stages: Kohlberg's theory, on the other hand, focuses on how individuals transition from basic obedience to authority (pre-conventional level), through seeking social approval and maintaining law and order (conventional level), to ultimately operating according to universal ethical principles like justice and human rights (post-conventional level). Kohlberg's theory emphasizes a more rule-based, principle-driven approach to moral development, where individuals are expected to adhere to justice and fairness regardless of personal or relational consequences. Gender Differences and Moral Development: Gilligan's Critique: Gilligan argued that Kohlberg's model was based primarily on male participants and reflected a masculine view of morality centered on rights and rules. She suggested that women tend to prioritize care and relationships in their moral reasoning, which Kohlberg's model fails to capture adequately. Kohlberg's Neutrality: Kohlberg, in contrast, believed that moral development was universal and did not account for gender differences in his theory. He saw moral reasoning as a progression from self-interest to an understanding of abstract justice and universal principles, applicable to everyone regardless of		

	gender. Decision-Making in Engineering: Gilligan's Perspective in Engineering: Engineers who align with Gilligan's care-based approach would emphasize relational aspects of decision-making. They would ensure that their work fosters well-being, avoids harm, and prioritizes the needs of all those affected by their engineering projects, including vulnerable populations. For instance, they might focus on making products that are safe and accessible to disadvantaged communities, even if doing so reduces profit margins. Kohlberg's Perspective in Engineering: Engineers who follow Kohlberg's justice-based approach would focus on ensuring that their decisions align with universal ethical principles, such as safety, justice, and fairness. They might be more willing to challenge company policies or external pressures if they believe those policies violate broader ethical principles, like public safety or environmental justice. Gilligan's theory of moral development emphasizes an ethic of care, focusing on relationships and the moral responsibilities individuals have towards others, contrasting with Kohlberg's focus on justice and universal principles. In the context of engineering, Gilligan's approach highlights the importance of empathy, relational thinking, and care-driven decision-making, while Kohlberg's theory emphasizes adherence to justice, rights, and moral autonomy grounded in universal ethical principles. Both theories offer valuable insights into how engineers can approach ethical dilemmas, with Gilligan's theory providing a relational perspective and Kohlberg's theory offering a justice-based framework for moral decision-making.		
8.	Illustrate the uses of ethical theories in engineering. Show how these theories can be applied to resolve moral dilemmas in the profession. Ethical theories provide frameworks to guide engineers in making sound, responsible decisions when facing moral dilemmas. Here's how key ethical theories can be applied to resolve common moral issues in the engineering profession: 1. Utilitarianism: Focuses on outcomes and seeks to maximize overall well-being. Application: Engineers use utilitarianism to evaluate the potential benefits and harms of different courses of action. The decision that provides the greatest good for the most people is chosen. 2. Deontology: Emphasizes duties and adherence to moral principles, regardless of the outcomes. Application: Engineers follow ethical rules, codes, and professional standards strictly, even if doing so leads to unfavorable consequences. This ensures ethical integrity and responsibility. 3. Virtue Ethics: Focuses on the moral character of the individual and developing virtues like honesty, integrity, and courage. Application: Engineers act in a way that reflects good moral character. They prioritize ethical actions not because of rules or consequences but because it's aligned with virtuous living. 4. Rights-Based Ethics: Emphasizes respecting the rights of individuals, such as the right to safety, privacy, or fairness.	CO5	K2

	Application: Engineers make decisions that protect the fundamental rights of all stakeholders involved, ensuring that their work does not infringe on individual rights. 5. Care Ethics: Focuses on empathy, relationships, and responsibility to care for others, particularly those affected by one's actions. Application: Engineers consider the well-being of all stakeholders, especially those who are vulnerable or marginalized, ensuring their needs are addressed with care and concern. Example of Moral Dilemma in Engineering: Dilemma: An engineer is asked to approve a project that meets the technical standards but may have long-term environmental impacts. o Utilitarianism: Approve the project if the overall benefits (economic and social) outweigh the environmental costs. o Deontology: Reject the project if it violates environmental protection laws, regardless of the benefits. o Virtue Ethics: Strive for a balance that upholds environmental integrity while benefiting society, demonstrating responsibility and foresight. o Rights-Based Ethics: Consider whether the project infringes on the rights of future generations to a healthy environment. o Care Ethics: Emphasize protecting the community’s long-term well-being, advocating for sustainable solutions.		