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Question Paper Code : 90446

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2025.

Fifth/Sixth/Seventh/Eighth Semester

Computer Science and Engineering

CCS 345 — ETHICS AND AI

(Common to : Computer Science and Engineering (Artificial Intelligence and Machine Learning)/Electronics and Communication Engineering/Mechanical Engineering/Artificial Intelligence and Data Science/Computer Science and Business Systems/Information Technology)

(Regulations 2021)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Differentiate natural intelligence and AI.
2. What do you mean by AI ethics?
3. What is the purpose of the OECD AI Principles in promoting ethical AI development?
4. What is your opinion on robots replacing pets?
5. What is RRI (Responsible Research and Innovation)?
6. What is meant by Algorithmic bias in the context of AI systems?
7. What is Roboethics and why is it important in the context of robotics development?
8. What kind of issues will arise when robots are used in a disaster situation?
9. Mention any two constraints for adoption of AI by Governments.
10. What are the benefits of using AI during surgeries?

PART B — (5 × 13 = 65 marks)

11. (a) Describe the potential impacts of AI on employment opportunities and the factors that influence public perception of AI technologies.

Or

- (b) 'The creation of AI machines and their use in society could have a huge impact on legal system' - explain the possible impact areas with examples.

12. (a) Why is it important to establish international ethical initiatives for AI, particularly in areas like healthcare and autonomous vehicles?

Or

- (b) Describe the ethical challenges posed by the use of AI in safeguarding privacy, human rights and dignity in everyday life of human beings.

13. (a) Discuss the potential challenges and benefits of implementing ontological standards for ethically driven robotics and automation systems in various industries.

Or

- (b) List the IEEE 'human standards' with implications for AI. Explain the objectives of any two of the standards.

14. (a) Describe the key ethical issues that arise in an Information and Communication Technology (ICT) society as it relates to the integration of robotics.

Or

- (b) There are ethical issues in engineering, science and technology as apart of ICT society - Justify your answer with proper reasons.

15. (a) Discuss the strategies on AI and initiatives taken by European countries and compare it with the strategies of Asian countries.

Or

- (b) Critically analyze the challenges and opportunities related to the ethical issues in using more and more artificial intelligence and its impact on a heavily populated country like India.

PART C — (1 × 15 = 15 marks)

16. (a) In the rapidly evolving landscape of technology, Autonomous vehicles (AVs) represent a crucial challenge for artificial intelligence ethics, whose tremendous expected benefits justify the fierce competition between both manufacturers and national governments. Some of the lower levels of automation are already well-established and on the market, while higher level AVs are undergoing development and testing. However, as we transition up the levels and put more responsibility on the automated system than the human driver, a number of ethical issues emerge.

This issue of human safety — of both public and passenger — is emerging as a key issue concerning self-driving cars. Major companies — Nissan, Toyota, Tesla, Uber, Volkswagen — are developing autonomous vehicles capable of operating in complex, unpredictable environments without direct human control, and capable of learning, inferring, planning and making decisions.

As a member of the designing team,

- How would you approach the ethical considerations surrounding the integration of AI in a fatal accident or a near-missed accident situation?
- What factors would you take into account when evaluating the potential benefits and risks of deploying AI in robotic cars, especially concerning issues such as bias, data privacy, and the potential impact on-road experiments?
- How would you navigate the balance between leveraging AI for technology advancement and ensuring that ethical standards and societal well-being are prioritized in the decision-making process?

Or

- (b) Smart Learn Academy is a private institution that aims to enhance the learning experience for students through the integration of artificial intelligence (AI) technologies. The academy uses AI-driven tools to personalize learning, track student performance, and streamline administrative processes. However, the implementation of these technologies has raised several ethical and operational challenges.

Key AI Implementations at SmartLearn Academy are

- Personalized Learning Platforms: SmartLearn Academy adopted an AI-based learning management system (LMS) that customizes educational content based on individual.

- **Personalized Learning Platforms:** SmartLearn Academy adopted an AI-based learning management system (LMS) that customizes educational content based on individual student learning styles preferences and progress. The system analyzes data from quizzes, assignments and engagement metrics to adjust learning pathways.
- **Automated Assessment Tools:** The academy implemented AI tools to automate grading and provide instant feedback on assignments and tests. This system aims to reduce the workload for educators and ensure timely Feedback for students.
- **Predictive Analytics for Student Success:** SmartLearn uses predictive analytics to identify students at risk of under performing. The AI system analyzes historical data to forecast outcomes and suggest interventions such as tutoring or counselling.

As a consultant identify the possible ethical Issues encountered by the SmartLearn Academy and design suitable strategies to address these issues.