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Question Paper Code : 50428

B.E./B.Tech. DEGREE EXAMINATIONS, APRIL/MAY 2024.

Fifth/Sixth 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. How do we define intelligence?

2. What do you mean by AI ethics?

3. Name the countries played key role in international ethical initiative and the key issue addressed.

4. What is your opinion on robotic pets? Give reasons.

5. What is RRI (Responsible Research and Innovation)?

6. What are Algorithmic bias considerations?

7. Define Roboethics.

8. What kind of issues will arise using robots during a disaster?

9. Mention any two roadblocks for adoption of AI by Governments.

10. What kind of opportunities are there in using robots in surgeries?

PART B — (5 × 13 = 65 marks)

11. (a) 'The growth of AI will create a big impact on society and jobs'-discuss.

Or

(b) Explain the major areas of AI involvement which may have a psychological impact on human life with suitable examples.

12. (a) Describe any five international ethical initiatives and the key issues addressed.

Or

(b) List the categories of key issues emerging from the international initiatives on ethical harms and concerns as a base to form ethical framework.

13. (a) Elaborate the General principles for the ethical and values-based design, development, and implementation of autonomous and intelligent systems.

Or

(b) What are the main ethical dilemmas and moral questions associated with the deployment of AI? www.EnggTree.com

14. (a) Explain the approaches adopted in devising a method for integrating ethics into the design of AI as a research focus.

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.

Or

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

PART C — (1 × 15 = 15 marks)

16. (a) A recent report concludes that AI technology has the potential to transform warfare to the same, or perhaps even a greater, extent than the advent of nuclear weapons, aircraft, computers and biotechnology. Imagine you are a senior AI developer working on a project that involves creating an advanced AI system for this purpose.

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This situation aims to explore the ethical dimensions of AI development and deployment in warfare, prompting thoughtful consideration of Responsibility, accountability, trusting the design which balances data into train, verify, and validate groups and the legal and ethical requirements to ensure transparency of a weapons review.

Ethical Considerations:

(i) What ethical principles are at stake in this scenario, and how do they relate to the development and deployment of AI in warfare? (5)

(ii) How would you address the issue of bias in the AI system to ensure fair and unbiased use of AI in war field? (5)

(iii) In balancing the benefits of accurate designing, training and the potential harms of biased decisions, how would you approach the decision-making process regarding the deployment of the AI system? (5)

Or

(b) 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,

(i) How would you approach the ethical considerations surrounding the integration of AI in a fatal accident or a near-missed accident situation? (5)

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(ii) 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? (5)

(iii) 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? (5)