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The Open University of Sri Lanka
Faculty of Engineering Technology
Department of Electrical and Computer Engineering

Study Programme	: Bachelor of Science Honours in Engineering / Bachelor of Software Engineering Honours
Name of the Examination	: Final Examination
Course Code and Title	: EEX7171 / EEI6171 Emerging Trends in Technology
Academic Year	: 2022 - 2023
Date	: 10 February 2024
Time	: 09:30 - 12:30hrs
Duration	: 3 hours

General Instructions

1. Read all instructions carefully before answering the questions.
2. Answers should be written in the answer book provided. Answer for each question should commence from a new page.
3. This question paper consists of **Four (4)** questions in **Three (03)** pages.
4. Answer all questions.
5. This is a Closed Book Test **(CBT).**
6. Answers should be in clear handwriting.
7. Do not use red colour pen.

Question 1

Large Language Models (LLMs) are a recent development that has transformed many aspects of human lives within a very short period. Its impact has been felt in areas such as Education, Health, Finance, Management and many others. A commonly used application of LLMs is the Generative Pre-Trained Transformers (GPT) and publicly available application, ChatGPT. Since then many LLMs have been introduced.
Answer the following questions with regard to Large Language Models.

(a) Explain the fundamental architecture and working principles of Large Language Models, with a focus on pre-training and fine-tuning.

(06 Marks)

(b) Large Language Models have raised ethical concerns, including bias and misinformation. Discuss the ethical challenges associated with LLMs and suggest strategies to mitigate bias and improve the responsible use of these models in real-world applications.

(10 Marks)

(c) Many IT industry leaders have called for regulating AI Development including the appointment of a dedicated "referee" to ensure safe AI practices.

(i) Discuss the possible reasons for industry leaders to call for regulating AI Development.

(04 Marks)

(ii) Evaluate the advantages and disadvantages of regulating such development, and give a conclusion whether it is a good idea to regulate or not.

(05 Marks)

Question 2

Digital Storytelling is considered an essential skill in the 21st Century.
Answer the following questions based on Digital Storytelling.

(a) Define Digital Storytelling and explain why it is considered an essential 21st Century Skill.

(04 Marks)

(b) Discuss the key components that differentiate digital stories from traditional storytelling. Provide examples of digital storytelling mediums and platforms.

(05 Marks)

(c) Digital storytelling often involves the integration of multimedia elements such as images, videos, and sound.

(i) Explain how the strategic use of multimedia enhances the storytelling experience.

(ii) Discuss the challenges and considerations when selecting and incorporating multimedia elements in a digital story.

(4 x 2 = 08 Marks)

(d) What are the ethical considerations and responsibilities associated with digital storytelling?

(04 Marks)

(e) Discuss how new developments in technologies will impact the future of digital storytelling.

(04 Marks)

Question 3

(a) Define what constitutes a Smart City and discuss the key principles that underpin the development of Smart Cities.

(04 Marks)

(b) How does the data play a central role in creating smarter and more sustainable urban environments?

(03 Marks)

(c) Discuss the ways in which technology can be leveraged to enhance sustainability, reduce resource consumption, and improve the quality of life for urban residents.

(06 Marks)

(d) With the proliferation of data in Smart Cities, data privacy and security concerns arise.

(i) Discuss the ethical and security challenges related to the collection, storage, and utilization of data in urban environments.

(ii) What measures can Smart Cities implement to address these concerns while maximizing the benefits of data-driven solutions?

(4 x 2 = 08 Marks)

(e) Discuss and give recommendations for the governments to ensure that introducing "Smartness" into cities does not violate the fundamental rights of citizens .

(04 Marks)

Question 4

Select any three (03) of the following systems and discuss how recent technological advances have made an impact on their development.

- Education
- Power Management
- Public Transport System
- Smart Banking
- Entertainment

For each system you have selected discuss:

(a) What are the emerging technologies that will have an impact on these systems?

(2 x 3 = 06 Marks)

(b) How can these systems be improved with the introduction of new technologies?

(2 x 3 = 06 Marks)

(c) What type of new problems will be introduced to these systems by applying the emerging technologies you have identified in part (a)?

(2 x 3 = 06 Marks)

(d) How can the problems identified in part (c) can be mitigated.

(1 x 3 = 03 Marks)

(e) Reflect on the impact of recent technological development in the society, for example in areas such as cultural changes, economic parity, social values and others.

(04 Marks)

----------END OF PAPER ----------