Evaluation Questions

Number	Topic	BSc	MSc	PhD
1	Deep Learning	What are the main differences between supervised and unsupervised deep learning algorithms, and how do they impact the training and application of neural networks?	Can you explain the theoretical foundations and underlying principles of supervised and unsupervised deep learning algorithms, and how they differ in terms of learning and inference processes?	Can you provide a comprehensive comparison between various supervised and unsupervised deep learning algorithms, including their performance, scalability, interpretability, and suitability for different types of data and tasks?
2	Deep Learning	Could you explain the basic concepts and architecture of convolutional neural networks (CNNs) and how they have been used for image classification tasks?	Can you provide an overview of the latest research papers that have pushed the boundaries of CNN-based image classification, highlighting the novel approaches, algorithms, or architectures proposed, and the improvements achieved over existing methods?	Can you discuss any notable research papers that have introduced novel regularization techniques, data augmentation strategies, or model interpretability methods in the context of CNNs for image classification, and how have these advancements influenced the overall field of deep learning?
3	Networking	Can you explain the concept of network congestion and its impact on the performance of distributed systems?	Based on recent research papers, what are the state-of-the-art techniques and algorithms proposed for detecting and mitigating network congestion in large-scale distributed systems?	Can you provide an in-depth analysis of congestion control algorithms, network topology optimization techniques, and traffic engineering strategies used to alleviate network congestion in distributed systems, and their effectiveness in real-world deployments?
4	Networking	Can you explain the basic principles and components of a wireless network infrastructure?	Can you discuss the trade-offs between different wireless network architectures, such as centralized versus decentralized	From a theoretical standpoint, how can network coding, beamforming, or multi-antenna techniques be leveraged to improve the

			approaches, and the impact of these choices on scalability, reliability, and overall network performance?	performance and efficiency of wireless network infrastructures, and what are the practical considerations for their deployment?
5	Crypto-Currency	Can you explain the basic concepts and components of a cryptocurrency system?	Can you discuss the trade-offs between decentralization and security in cryptocurrency systems, and how different consensus algorithms contribute to ensuring the integrity and trustworthiness of the network?	Can you provide a critical analysis of recent security breaches and attacks on cryptocurrency systems, and discuss the potential countermeasures and design improvements that can mitigate such threats?
6	Bitcoin	What are some limitations or challenges faced by the Nakamoto consensus algorithm, such as scalability, energy consumption, and the potential for 51% attacks?	Based on recent research papers, what are the proposed enhancements or alternatives to the Nakamoto consensus algorithm in Bitcoin, and how do they aim to address its limitations in terms of scalability, transaction throughput, and energy efficiency?	From a critical standpoint, can you analyse the proposed improvements or alternatives to the Nakamoto consensus algorithm, highlighting their strengths and weaknesses, and discuss the implications of adopting these alternatives on the overall Bitcoin ecosystem?
7	AR/VR	How do Augmented Reality (AR) and Virtual Reality (VR) differ from each other, and what are the implications of these differences for users?	What specific factors differentiate Augmented Reality (AR) and Virtual Reality (VR) in terms of technology, immersion, and user interaction, and how do these factors shape the overall user experience?	Can you provide a comprehensive analysis of the key distinctions between Augmented Reality (AR) and Virtual Reality (VR) technologies, taking into account factors such as sensory perception, interaction paradigms, and spatial mapping, and discuss the implications of these distinctions on the overall user experience?
8	IoT	Can you provide examples of real-world applications	Can you discuss the trade-offs and implications of scalability, security, and	From a critical standpoint, what are the implications of integrating Internet of Things (IoT) technologies in

		where the Internet of Things (IoT) is being employed, and discuss the potential benefits and challenges associated with integrating IoT technologies in these domains?	privacy in the design and deployment of Internet of Things (IoT) systems, and how different approaches and architectures address these considerations?	domains such as energy management, industrial automation, or environmental monitoring, and how do these implications influence system performance, data management, and user privacy?
9	IoT	What are some basic security measures that can be implemented to protect IoT devices and data from unauthorized access and potential cyber threats?	Can you discuss the trade-offs between security and resource-constrained IoT devices, and how cryptographic techniques, secure communication protocols, and access control mechanisms can be optimized for efficient and robust IoT security?	From a critical perspective, can you analyse the vulnerabilities and attack vectors specific to the Internet of Things (IoT), and discuss the emerging technologies, such as blockchain or machine learning, that are being explored for enhancing IoT security and trust?
10	Computer Vision	What are some common challenges faced by computer vision algorithms in accurately detecting and recognizing objects in images or videos?	Can you discuss the trade-offs and performance implications of different object detection and recognition frameworks, such as Faster R-CNN, SSD, or YOLO, and the advancements made in terms of real-time processing and multi-object tracking?	What are the current research challenges and open problems in the field of computer vision for object detection and recognition, and what are the potential research directions to improve accuracy, interpretability, and generalization of algorithms in complex and dynamic environments?