

Register Number:.....

MCA DEGREE EXAMINATIONS: NOV/DEC 2024

(Regulation 2020)

Third Semester

MASTERS OF COMPUTER APPLICATIONS

P20CAE0023 - Advanced Metaverse Technologies

COURSE OUTCOMES

CO1: Acquire knowledge to differentiate various Extended reality technologies in Metaverse.

CO2: Apply Metaverse Experiences with depth understanding on devices and interoperability.

CO3: Analyze Metaverse in various application domains.

CO4: Develop the Metaverse environment with the integration of other technologies.

Time: Three Hours

Maximum Marks: 100

Answer all the Questions:-

PART A (10 x 2 = 20 Marks)

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|--|-----|-------------------|
| 1. Define Extended Reality (XR) and explain its components, focusing on AR, VR, and MR. | CO1 | [K ₁] |
| 2. Identify the process of creating a Web XR environment and how it differs from traditional XR environments. | CO1 | [K ₂] |
| 3. Illustrate how avatars in the Metaverse impact user identity and engagement. | CO2 | [K ₃] |
| 4. List and describe different types of interactions used in the Metaverse (e.g., hand controllers, gestures). | CO2 | [K ₁] |
| 5. Describe the role of cloud hosting in distributing Metaverse applications across platforms. | CO2 | [K ₂] |
| 6. Explain how blockchain technology secure digital assets such as NFTs in the Metaverse? | CO3 | [K ₂] |
| 7. Mention two real-world applications of XR technologies in the architecture industry. | CO3 | [K ₁] |
| 8. Define sports can be enhanced by integrating XR technologies in the Metaverse? | CO3 | [K ₂] |
| 9. Show the key considerations for designing a safe and secure Metaverse environment. | CO4 | [K ₃] |
| 10. Define cryptocurrency and explain its role in transactions within the Metaverse economy. | CO4 | [K ₁] |

Answer all the Questions:-

PART B (6 x 5 = 30 Marks)

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|--|-----|-----|-------------------|
| 11. Apply the differences between AR, VR, and MR to explain how each can create unique experiences in the Metaverse. | (5) | CO1 | [K ₃] |
| 12. Analyze how the brain's response to immersive environments in VR influences user | (5) | CO1 | [K ₄] |

engagement and interaction.

13. Illustrate the process of designing an avatar and integrating it into a Mixed Reality (MR) environment. (5) CO2 [K₃]
14. Apply the concept of cloud hosting to explain how Metaverse applications can be streamed across multiple devices. (5) CO2 [K₃]
15. Analyze the role of NFTs in creating ownership of digital assets in the Metaverse. (5) CO3 [K₄]
16. Apply 3D scanning techniques to create high-fidelity virtual objects for VR applications in the Metaverse. (5) CO4 [K₃]

Answer any FIVE Questions

PART C (5 x 10 = 50 Marks)

17. Evaluate the impact of 5G technology on the development and mass adoption of XR in the Metaverse. (10) CO1 [K₅]
18. Discuss the educational potential of the Metaverse, focusing on the ways in which XR technologies can enhance learning. (10) CO3 [K₅]
19. Evaluate the challenges faced in ensuring cybersecurity within the Metaverse and propose solutions. (10) CO4 [K₅]
20. Compare the roles of Microsoft, Apple, and Facebook in shaping the current landscape of the Metaverse. (10) CO2 [K₄]
21. Assess the current limitations of interoperability in the Metaverse and discuss the potential benefits. (10) CO2 [K₅]
22. Design a use case scenario where blockchain, Web 3.0, and AI are integrated to improve functionality in the Metaverse. (10) CO3 [K₆]
