



विश्वजीवनमृतं ज्ञानम्

# Atal Bihari Vajpayee Indian Institute of Information Technology & Management, Gwalior

## IT031: Blockchain Technologies

Minor Examination (Session 2023–24)

Maximum Time: 1.5 Hours

Max Marks: 30

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*Note: Attempt all questions. State assumptions clearly.*

1. True/False (with justification, 2 marks each): (a) Blockchain eliminates the need for cryptography. (b) Public blockchains are more scalable than private ones. (c) Bitcoin uses Proof-of-Stake consensus. (6 Marks)
2. What are Merkle Trees? Explain their role in ensuring data integrity in blockchains. (6 Marks)
3. Differentiate between Public, Private, and Consortium blockchains with real-world examples. (6 Marks)
4. **Numerical:** A block contains transactions with hashes  $h_1 = 23AB$ ,  $h_2 = 41CD$ ,  $h_3 = 56FA$ ,  $h_4 = 89EF$ . Construct the Merkle root step by step. (6 Marks)
5. Write short notes (any two): (a) Smart Contracts (b) Blockchain in Supply Chain (c) Gas fees in Ethereum (6 Marks)