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**PES University, Bengaluru**  
(Established under Karnataka Act No. 16 of 2013)

UE18CS324

**DECEMBER 2021: END SEMESTER ASSESSMENT (ESA) B TECH 5<sup>th</sup> SEMESTER**

**UE18CS324 - Blockchain**

Time: 3 Hrs		Answer All Questions		Max Marks: 100
1	a)	Define Blockchain and explain the types of blockchain.		6
	b)	Describe the three-phase process of nodes on a Hyperledger Fabric network that ensures all peers keep their ledgers consistent with each other.		6
	c)	Differentiate between token and cryptocurrency.		4
	d)	ABC Hospital plans to replace existing traditional data storage and management system with blockchain. Analyze and describe how effective it would be with some advantages.		4
2	a)	Assume that blockchain is using 256-bit hash function where M is the input message and H(M) is the output message digest. Explain the properties of hash function and also how hash function is used in block chain.		8
	b)	Describe the role of mining in block chaining with a scenario.		6
	c)	Suppose Seema wants to communicate with Rita and she encrypt her message using RSA algorithm. She creates her own private and public keys, by choosing the values as $p=3$ & $q=11$ and $M=20$ . Calculate the value of $d$ , if $e=7$ . Also mention the value of keys that will be published and kept secret by Seema		6
3	a)	What is Merkle tree? How hashing is used in it and also mention the advantages of it.		5
	b)	Illustrate the working of Byzantine Fault Tolerance System in blockchain.		4
	c)	Explain consensus algorithm and its importance in blockchain.		3
	d)	Explain the pros and cons of the following algorithms: (i) Proof of Stake (ii) Proof of Capacity (iii) Proof of Elapsed Time (iv) Proof of Burn		8

4	a)	What is smart card and how does it work? Explain with an example.	8
	b)	Today, due to the explosion of Decentralized Finance (DeFi) during 2020, has led to a rise in renewed interest in DAOs. Explain how DAO is different from traditional organization. Give some examples.	6
	c)	How Hyperledger Fabric works. Explain the benefits of Hyperledger Fabric with examples.	6
5	a)	Illustrate any five common attacks encountered on blockchain.	5
	b)	Describe the smart contract Vulnerabilities with respect to virtual machine.	6
	c)	What is CIA triad? How much does blockchain impact the CIA triad?	5
	d)	How can blockchain transform DDoS protection?	4