

Roll No



**PRESIDENCY UNIVERSITY  
BENGALURU**

**SCHOOL OF ENGINEERING  
END TERM EXAMINATION - JAN 2023**

**Semester :** Semester V - 2020

**Course Code :** CSE2019

**Course Name :** Sem V - CSE2019 - Foundations of Blockchain Technology

**Program :** B.Tech. CBC

**Date :** 11-JAN-2023

**Time :** 9.30AM - 12.30PM

**Max Marks :** 100

**Weightage :** 50%

**Instructions:**

- (i) Read all questions carefully and answer accordingly.
- (ii) Question paper consists of 3 parts.
- (iii) Scientific and non-programmable calculator are permitted.

**PART A**

**ANSWER ALL THE TEN QUESTIONS**

**10 X 2 = 20M**

1. Write a short note on Decentralized Network and Peer to Peer Networks  
(CO1) [Knowledge]
2. Briefly describe the concept of Decentralized Network and Peer to Peer Networks  
(CO1) [Knowledge]
3. Define Public and Private Blockchain. Give one example for each.  
(CO1) [Knowledge]
4. What is the consensus Algorithm used in Bitcoin and Ethereum?  
(CO1) [Knowledge]
5. Differentiate between partial and full node.  
(CO2) [Knowledge]
6. What is the role of prime number in generating hash in SHA 256 Algorithm ?  
(CO2) [Knowledge]
7. Explain in brief any two factors that affects the performance of bitcoin.  
(CO2) [Knowledge]
8. List the keys used to Create and Validate Digital Signature?  
(CO3) [Knowledge]
9. Write a short note on Ethereum Virtual Machine  
(CO3) [Knowledge]
10. What is the use of nonce in generating hash?  
(CO4) [Knowledge]

## PART B

ANSWER ALL THE FIVE QUESTIONS

5 X 10 = 50M

11. When you are having multiple fields to be stored in a block, how do you consolidate multiple hashes into single hash? Which data structure used for this purpose? Explain by taking atleast 5 fields in a student database.  
(CO1) [Comprehension]
12. State CAP theorem in Blockchain? What is the need for it? How can you apply the this theorem properties on this smallest of possible distributed systems only with two nodes?  
(CO1) [Comprehension]
13. There are various requirements that must be met to provide the desired results in a consensus mechanism. Explain these requirements by comparing with any real time example.  
(CO2) [Comprehension]
14. Write the architectural diagram that shows the components of an Ethereum ecosystem. Explain all the fields in detail.  
(CO2) [Comprehension]
15. What is the relationship between transaction and block header in Ethereum? By using the following parameters justify the relationship. (a). contract creation transaction (b). Message call transaction  
(CO4) [Comprehension]

## PART C

ANSWER ALL THE TWO QUESTIONS

2 X 15 = 30M

16. Take any two examples which adopt Blockchain technology. Among these two examples, catrgoriza into Public or Private Blockchain. Write a solidity code to create a node for the example you have chosen.  
(CO2) [Application]
17. Assume that you are storing the details of Presidency University faculties in a Blockchain. Which type of Blockchain do you suggest for this purpose? How do you calculate the root hash from individual faculty details (name, emp\_id etc)? Which consensus mechanism is best suitable for this? Justify your answer  
(CO4) [Application]

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