Roll Number: _____ Name: _____

Thapar Institute of Engineering & Technology, Patiala
(Deemed to be University)
Department of Electronics & Communication Engineering
MST- Written Test

BE-ENC, TSLAS	**Course: UEC635 Blockchain Technology**
Maximum Marks: 25	**Date: March 18th , 2023**
Time: 02 Hours	**Faculty Name: Dr. Shashikant**

NOTE: * Attempt all five questions
** Assume any missing information.

Q1.	**a.** What is the purpose of using consensus algorithms in Blockchain network? Which consensus algorithm is used by Bitcoin Network. **b.** What is difficulty level in context of mining? How its value is decided? **c.** Write name of any three types of Cryptowallets.	**(2)** **(2)** **(1)**
Q2.	**a.** What do you understand by "decentralization" and "immutable" features of Blockchain? Describe these in detail. **b.** State CAP theorem and explain using suitable diagram. What is your comment on the statement "Blockchain violates the CAP theorem at first glance."?	**(2)** **(3)**
Q3.	**a.** Draw the flowchart describing transaction life cycle in Bitcoin. **b.** What is Merkle root in the block header? How it is computed and used in different blocks in the blockchain networks?	**(2)** **(3)**
Q4.	**a.** Solidity provides special modifiers for functions, such as view, pure, and constant. What is the purpose of using these modifiers? Also differentiate between pure and view functions. **b.** Write a function in solidity with two inputs (a string `name_of_student` and a fixed size array `sessional_marks` of size 3) and two outputs (`total_marks` and `result`). `total_marks` is sum total of all three sessional and `result` is declared as "Pass" or "Fail" depending on marks(passing marks is 40).	**(2)** **(3)**
Q5.	Design a smart contract with illustration of `struct` (to store information about student, say the student name, roll no. and group) and `enum` (with values **"ENC1, ENC2, ENC3, TSLAS"**). Use a function to assign group to students based on the value of roll no. (*for first 20* => **ENC1**, *next 20*=>**ENC2**, *next 20*=>**ENC3**, *else* => **TSLAS**).	**(5)**

********** All the Best **********