

**Final Assessment Test – November 2024**

Course: BCSE325L - Introduction to Bitcoin

Class NBR(s): 1406

Time: Three Hours

Slot: F1+TF1

Max. Marks: 100

- KEEPING MOBILE PHONE/ANY ELECTRONIC GADGETS, EVEN IN 'OFF' POSITION IS TREATED AS EXAM MALPRACTICE
- DON'T WRITE ANYTHING ON THE QUESTION PAPER

Answer ALL Questions

(10 X 10 = 100 Marks)

1. Demonstrate the necessary characteristics of a cryptographic hash function with suitable application examples.
2. Demonstrate the functionality of Scrooge coin with relevant examples, showcasing the following operations:
 - i. Coin Generation
 - ii. Pay Coin
 - iii. Coin Division
3. Illustrate the relationships among the transactions explained in the following scenario using an appropriate the transaction reference/relationship and write down the pay to public key hash script and evaluate the script.

Mac is having strong affinity towards Bitcoin (BTC) systems. He is willing to purchase a product which costs around 20 BTC from ABC.com. For that, he is utilizing 12.5BTC from one of his reward transactions whose transaction id is E2F001. As the Bitcoin balance is lacking by 7.5 BTC, Mac decided to use 7.5 BTC from his previous transaction whose transaction id is A2B001, which is having a balance of 20 BTC. After doing a simple math, Mac finds that he has a potential opportunity to earn more profit if he invests in Bitcoin. So he decided to invest the remaining amount in his transaction A2B001 (after purchasing a product) to purchase Bitcoin cryptocurrency.
4. The total estimated annual energy consumption of the Bitcoin network is approximately 60 terawatt-hours (TWh), according to a top-down analysis. You are tasked with using the bottom-up approach to estimate the energy usage of a specific Bitcoin mining farm. The farm consists of 1,000 mining rigs, each with an average power consumption of 1,200 watts. These mining rigs operate 24/7 throughout the year. Calculate the estimated annual energy consumption of this Bitcoin mining farm using the bottom-up approach.
5. Compare and contrast various types of Bitcoin wallets, highlighting their advantages and disadvantages. Also, discuss the key factors to consider when selecting a wallet for a specific application.
6. Describe the End-to-End Bitcoin Payment Process through a Payment Processing Interface, Highlighting the Interactions between the Customer, Merchant and Payment Service Provider.