Question 1   5 pts

Which of the following is/are debt instrument(s)?

1. Bond
2. Leases
3. Cash
4. Cheque

Please give the reason(s) for your choice based on the debt instrument's nature in the text box provided below.

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Question 2   5 pts

What is the Present Value (PV) and Yield to Maturity (YTM) of a simple loan if its future value (FV) after three years is $1500? Given the annual interest rate is 12%.

1. PV = $960 and YTM = 56.3%
2. PV = $1030 and YTM = 31.3%
3. PV = $600 and YTM = 56.3%
4. PV = $1030 and YTM = 40.5%
5. None of the above are correct

Please give reasons for the choices in the text box below

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Question 3   5 pts

Which of the following statement/statements about P/E value is/are CORRECT?

1. A company with a stock price of $50 has a P/E ratio of 20 means that its earnings per share are $2.5.
2. A company that has a lower P/E ratio means that it has a higher earning power.
3. A company with a higher P/E ratio means that people are more interested in investing in the stock. However, this may not explicitly indicates the stock quality stock for long terms of investment.
4. A higher P/E ratio for a company means its market price value is higher than those with a lower P/E ratio.

Please give reasons for the choices in the text box below

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Question 4   5 pts

What is/are the differences and similarities between stocks and bonds?

1. Both bonds are a loan from the investors to a company, and stocks are not.
2. Bonds are a kind of debt instrument but not stocks.
3. Both bonds and stocks can provide a steady source of regular income.
4. The liquidity of stocks and bonds is high than cheques

Please give reasons for the choices in the text box below

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Question 5   5 pts

The worldwide mobile payment transaction volume is increasing significantly over the past five years. It is forecasted to grow continuously. Which is/are the possible reasons for the growth?

1. It is more secure to use because many counterfeiting apps have been developing for protecting the customers and show owners
2. Customer can track their spending more easily
3. The network penetration is increasing
4. Shopping using cash or credit cards are inconvenient to use

Please give reasons for the choices in the text box below

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Question 6   5 pts

Which of the following statement/statements about financial markets is/are not CORRECT?

1. It helps to decide the prices of various financial securities
2. It helps to provide opportunities for people with smart ideas to implement their idea.
3. It helps to improve the liquidity of debt instruments
4. It helps to improve the transparency of financial activities by increasing the asymmetric information in the markets

Please give reasons for the choices in the text box below

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Question 7   5 pts

What is the maximum number of transaction(s) is/are allowed in a Blockchain block?

1. Only one transaction
2. Two transactions
3. There is no maximum number of transactions, except that it requires an even number of transactions, for example, 2, 4, 6, 8, etc.
4. None of the above

Please give reasons for the choices in the text box below

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Question 8   5 pts

If we want to access the next block's information in a Blockchain, which of the following way(s) can be used?

1. Block index
2. Block hash
3. Nonce
4. No of the above

Please give reasons for the choices in the text box below

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Question 9   5 pts

How many SHA-512 hashes must be computed to obtain the Merkle root of 23 transactions?

1. 32
2. 48
3. 51
4. 54

Please give reasons for the choices in the text box below

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Question 10   5 pts

Which of the following statement/statements is/are CORRECT?

1. The "nonce" is an algorithm to regulate the generation rate of a new block
2. A miner is a computer that collects transactions and organizes them into blocks
3. Orphan blocks are invalid blocks that have been rejected by the chain
4. A blockchain is a centralized ledger on a peer to peer network

Please give reasons for the choices in the text box below

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PART B

Question 2   15 pts

Answer all the following questions.

1) What is tokenization? Use a bank account as an example. Explain how tokenization can help to increase the security in mobile payment.   (4 marks)

2) Five potential vulnerabilities are affecting mobile payment systems. They are man-in-the-middle attacks, replay attacks, repudiation, impersonation, and unauthorized access. Explain their meaning briefly. Suggest one potential vulnerability that tokenization may not be able to increase the security of mobile payment. (8 marks)

3) Discuss the technologies used with WeChat pay and how these technologies help improve the security of mobile payment. (3 marks)

Answer the following questions.

1) Discuss, in point forms, the key features of a Blockchain. (5 marks)

2) Based on the information given in the following news, discuss why DECP is not a crypto-currency. (5 marks)

> **China's central bank has issued 10 million yuan ($1.5m; £1.1m) worth of digital currency to 50,000 people in the Shenzhen area via a lottery.**
>
> The move is the latest in a series of trials testing out China's new Digital Currency Electronic Payment (DCEP).
>
> Those who were successful received digital "red packets" worth about 200 yuan, which they could download and spend at more than 3,000 stores.
>
> Nearly two million people signed up to take part in the lottery.
>
> The People's Bank of China (PBOC) says it plans to launch DCEP later this year, although it is yet to set a date.
>
> In April, it was conducting tests in four cities across China, and intends to pilot the system at future Winter Olympics venues.

3) The primary purpose of applying "proof-of-work" is to slow down the block generation rate in a Blockchain. Explain what will be the problem(s) if we do not control the block generation rate. If we have a perfect network that the data transfer across all the nodes are instance (no time delay), do you think the mentioned problem(s) can be solved without using "proof-of-work"? (5 marks)

4) Regarding figure Q11 shown, discuss step by step what will happen if a new block 1234 is appended to block 0101. (5 marks)

Figure Q11

```
0101        D101
  |           |
  v           v
DD01        BB11
  |           |
  +-----> 33FF
              |
              v
            AB12
              |
              v
            A397
```
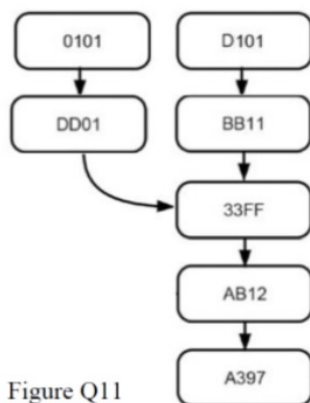
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