

# Past-paper walk-through

Digital currency ■ 5.2

eXercise

## Questions in this set

- 0478/11 N24 Q8 ■ 4 marks
- 0478/12 M24 Q5 ■ 4 marks
- 0478/12 N23 Q12 ■ 3 marks

## Reading the mark scheme

- **B1** a mark that stands on its own – the point is either made or not.
- **M1** a *method* mark: the right approach, even if the number is wrong.
- **A1** an *answer* mark, and it usually needs its M mark first.
- **C1** a working mark on the way to the answer.
- **//** separates answers the examiner accepts equally.
- **ecf** = error carried forward: a later part is marked on your own earlier answer.
- **owtte** = “or words to that effect” – the wording need not match.

## Question 8

0478/11 N24 ■ Q8 ■ 4 marks

Draw and annotate a diagram to show how a payment transaction is made using digital currency and blockchain.

**[4]**

## Solution 8

### Worked steps

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Draw the parties — **payer**, **payee** — and the **blockchain** as a chain of linked blocks, with annotated arrows. One mark for each correct part.

- A **digital ledger** records the transaction — the blockchain is that ledger.
- The **device encrypts the transaction data**.
- The transaction is **added to a block**, which is **verified** by the network.
- Each block **links to the previous one**, holding its hash ...
- ... so **altering one block breaks the chain** and the change is detected.
- The ledger is **copied to every user** on the network, so there is no single central record.

## Solution 8

### Worked steps

Draw the chain as at least **three linked blocks** with the link labelled. That link is the whole idea: each block carries the hash of the one before it, which is what makes the history tamper-evident.

The two annotations that most often decide the marks are **decentralised** — **every participant holds a copy** and **immutable** — **a change to one block invalidates every block after it**. Both are properties of the drawing, so label them on it rather than writing a paragraph underneath. [Mark scheme](#)

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- One mark for each correct part.
- The diagram shows:

## Solution 8

### Worked steps

- ▪ Digital ledger is used
- ▪ Device encrypting data
- ▪ Device sending data to digital ledger
- ▪ Payment being recorded on digital ledger
- ▪ ... including details such as digital signature/time/date stamp
- ▪ Transaction is stored in a block ...
- ▪ ... in multiples
- ▪ Each block has block hash/unique identifier
- ▪ When block is executed or full

## Solution 8

### Worked steps

- ■ ... it is applied to every device that has the blockchain // Block is added to blockchain (on each device)
- For example:
- 4
- Device
- Digital ledger
- Block
- Blockchain
- Customer's device encrypts payment data
- Payment data sent



## Solution 8

### Worked steps

- Transaction is stored in a block
- When block is full, it is added to the blockchain
- Block hash

## Question 5

0478/12 M24 ■ Q5 ■ 4 marks

Complete the description of digital currencies using the terms provided.

- blockchains
- changed
- datachains
- decentralised
- deleted
- encryption
- passport
- physical address
- physically

## Question 5

- records
- time-stamp
- traced
- transaction-chains
- virtually

A digital currency does not exist \_\_\_\_, it can only be accessed electronically.

Some digital currencies have digital ledgers called \_\_\_\_.

These are decentralised databases where each transaction is stored as a new set of data with a \_\_\_\_ and is linked to the previous set of data. This means that transactions cannot be altered, only new transactions added, which allows the location of the data to be \_\_\_\_.

## Solution 5

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- Student's computer
- DNS
- URLs
- .....co.uk
- .....co.uk
- IP
- 250.256..
- 058.51..

## Solution 5

- 2. Find IP for URL
- 1. URL
- 3. IP
- Web server
- 5. Process request
- 4. request to IP
- 6. HTML web page
- 5
- One mark for each term in correct place:

## Solution 5

- ■ physically
- ■ blockchains
- ■ time-stamp
- ■ traced
- A digital currency does not exist physically, it can only be accessed electronically.
- Some digital currencies have digital ledgers called a blockchains. These are decentralised databases where each transaction is stored as a new set of data with a time-stamp and is linked to the previous set of data. This means that transactions cannot be altered, only new transactions added, which allows the location of the data to be traced.

## Question 12

0478/12 N23 ■ Q12 ■ 3 marks

**12** Digital currency can be used to pay for products and services.

Digital currencies are often tracked using digital ledgers.

**(a)** Give **two** other features of digital currency.

## Question 12

[2]

- (b)** Identify the process that uses a digital ledger to track the use of digital currency.



## Solution 12

### (a) Mark scheme

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- Any two from:
  - —
  - Only exists electronically
  - —
  - Can be a decentralised system
  - —
  - Can be a centralised system
  - —

## Solution 12

- Usually encrypted
- 2

# Solution 12

(b)

## Mark scheme

- —
- Blockchain
- 1
- 0478/12
- October/November
- 2023