MODULE F THE INTERNET · F5

Digital currency and blockchain: mark scheme

20 marks · Cambridge 0478 syllabus (exams 2026-2028) 5.2.1 (the concept of a digital currency and how digital currencies are used) and 5.2.2 (the process of blockchain and how it is used to track digital currency transactions)

How to use. One mark per creditworthy point up to the maximum shown. **/** separates alternative words; **//** separates alternative answers. Words in (brackets) are not needed for the mark. Credit any other valid answer that shows the same understanding. Hash values are not named in the syllabus notes: credit them where valid, but never require them.

QUESTION	ANSWER	MARKS	GUIDANCE
1(a) 0478 5.2.1, 5.2.2	Used to pay for goods and services: True Handing over physical coins or notes: False Time-stamped series of records: True Can be edited to correct a mistake: False Each new block linked to the block before it: True	**5**	One mark per correct row. A row with both boxes ticked scores 0.
2(a) 0478 5.2.1	Any one from: A currency / money that exists only electronically // only in electronic / digital form A currency that has no physical form // no physical coins or notes (and is only held / used electronically)	**1**	Accept "only exists virtually / digitally". Do not accept "money used online" or "money on a computer" alone: the answer must show it exists only electronically. Accept a correct example (e.g. cryptocurrency) only alongside the definition.
2(b) 0478 5.2.1	Any two from: The payment is transferred / sent electronically // over the internet / a network ... from the customer's (digital currency) account / wallet to the workshop's account / wallet No physical money is handed over The transaction is recorded (in a digital ledger // blockchain) // the payment can then be tracked	**2**	max 2. Credit any other valid answer. Do not credit "the customer pays online" alone, or answers that describe handing over cash.
3(a) 0478 5.2.2	Any two from: The amount (paid) Who sent the payment // the payer / sender (e.g. the firm) Who received the payment // the payee / recipient (e.g. the driver) A time-stamp // the date / time of the transaction A link to the previous block // the hash (value) of the previous block The block's own hash // unique identifier	**2**	max 2. "Transaction details" on its own and a specific detail of the same transaction (e.g. the amount) score 1 only. Credit any other valid item. Do not accept "the currency" or "money" alone.

QUESTION	ANSWER	MARKS	GUIDANCE
3(b) 0478 5.2.2	Any four from: The payment / transaction details are sent (from the firm's device) to the digital ledger // network The transaction is time-stamped // the date and time are recorded The transaction is stored in a (new) block (with other transactions) The new block is linked to the previous block // to Block 3 // stores the hash of Block 3 The new block is added to the end of the chain // becomes Block 4 Earlier blocks are not changed // the record is only added to, not altered The updated blockchain is copied to / shared with every computer / device that holds the blockchain The payment can now be tracked / traced (by anyone with the ledger)	**4**	max 4. Credit any other valid answer. Do not credit "the payment is added to Block 3" or "Block 3 is updated": earlier blocks are never altered. Encryption of the payment data by the firm's device is creditworthy as one point.
4(a) 0478 5.2.2	Any three from: A blockchain is a series of (time-stamped) records that cannot be altered // new records can only be added (not changed or deleted) Each block is linked to the previous block // Block 3 holds a link to / the hash of Block 2 Changing Block 2 would break its link to Block 3 // to all the later blocks // would change its hash so it no longer matches the one stored in Block 3 ... so the change would be detected (and rejected) Copies of the blockchain are held on many computers // the ledger is decentralised ... so the altered copy would not match the other copies (and would be rejected)	**3**	max 3. Credit any other valid answer. Do not credit "it is secure", "it is encrypted" or "it is protected by a password" alone: these do not explain why the record cannot be altered.
4(b) 0478 5.2.2	Make a new / second payment // transaction (for the amount still owed, which is recorded in a new block added to the blockchain)	**1**	Do not credit any answer that edits, replaces or deletes Block 2.
5(a) 0478 5.2.2	Any two from: Every payment / transaction (the firm made) is recorded (permanently) in the blockchain Each record is time-stamped // shows the date of the payment // so the October 2026 payments can be found Records cannot be altered // deleted, so the accountant can trust that they are accurate / complete Each transaction can be tracked / traced (back through the chain of blocks)	**2**	max 2. Credit any other valid answer. Do not credit "it is easier / faster" alone.

Total: 20 marks