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Q1. The major difference between bitcoin and ethereum is that bitcoin is a cryptocurrency whereas ethereum is a programmable currency. It is, a ledger technology used to build new programs.

Blockchain technology is used by bitcoin (BTC) to represent virtual currency.

Ethereum (ETH) utilises blockchain technology to maintain a decentralized payment network.

Ethereum also is used to store computer code which can be used to power tamper proof decentralised financial contracts and application

Ethereum applications and contracts are powered by ether, the Ethereum network's currency.

Blocks on Bitcoin network are added on an average every 10 minutes whereas on Ethereum, they are added about 15 seconds.

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Q2.

Hyperledger Fabric	Hyperledger Sawtooth
It is hosted under the umbrella of the The Linux Foundation.	It is an enterprise blockchain platform which works on making smart contracts safe and keeping ledgers distributed.
It chooses fine grained governance over participation in the network by Membership Service Providers (MSP).	It provides a Distributed Ledger technology network (DLT) that can be permissioned or permissionless.
It uses Kafka consensus mechanism.	It uses Proof of Elapsed Time (PoET) mechanism.
Provides and supports chaincodes that can be written in JS, Go languages.	It has transaction families which can be written in any programming language.
All transactions processed in batches of Kafka blocks.	All transactions processed together or not at all processed.

2

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Q3.

The components of a hyperledger Fabric are:-

① Shared ledger:-

The Shared ledger records the state and ownership of an asset.
It consists of two components
① world state - state of ledger at a given point in time
② blockchain - transaction log history that records all transactions.

② Assets
Anything that has value. Represented as key-value pairs

③ Smart contract.
In hyperledger Fabric, they are called chaincode. Chain code is a software that defines assets and related transactions.

④ Peer nodes
They host ledgers and smart contracts. They execute chaincode, access ledger data, endorses transactions and interfaces with applications.

⑤ channel

    channels are a logical structure formed by a collection of peers.

⑥ Organizations :

    The network exists because organizations contribute their individual resources to the collective network.

⑦ Membership Services Provider (MSP)

    This is implemented as a certificate authority to manage certificates used to authenticate member identities and roles.

⑧ Ordering service

    Ordering service packages transactions into blocks to be delivered to peers on a channel. It communicates with peers and endorsing peers.

Q4)

    The key elements required in IRIS website are:

① storing student information securely.
② View lectures, assignments and notes
③ submit educational documents
④ keeping sensitive information confidential.

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⑤ Various levels of access for different users e.g teachers and students.

Private information a student is no longer collected under a central authority where data can be exposed. All the data in the blockchain is associated with user's public key and can be accessed by its associated private key. Once the data is hashed and stored, it cannot be removed.
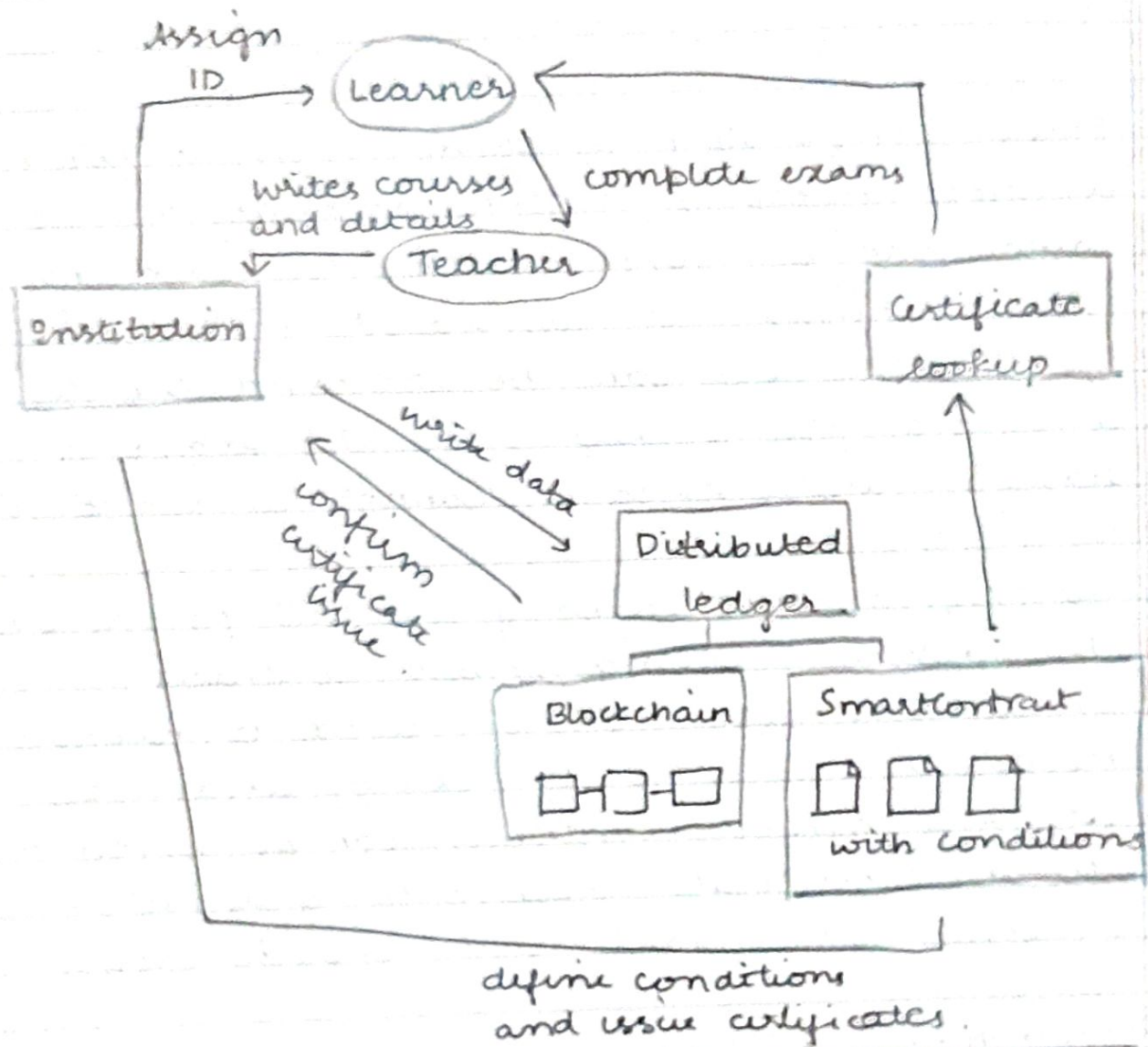
The logical functioning of the IRIS portal can be designed using smart contracts. Smart contracts can be used to process transactions related to college and hostel fees. Also smart contracts can be used to deliver certificates related to graduation or issue attendance and grade cards.

Blockchain student cognitive profiling, along with all the features of blockchains such as anonymity, integrity, independence, offers a different approach to employment and employment selection, and offer fullest and widest approach to education.

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The architectural design :-

Assign
ID → (Learner)

writes courses
and details   complete exams

(Teacher)

Institution   Certificate
                     lookup

write data

confirm
certificate
issue   Distributed
                     ledger

                     Blockchain   SmartContract

                     □-□-□   □ □ □
                                          with conditions

define conditions
and issue certificates.

Q5)

Bitcoin works through consensus. when
someone tries to change code, a fork
in the blockchain happens. Bitcoin
runs on running and Bitcoin fork will
become its own chain at the block the

6

update was created.

History of forks.

Bitcoin XT : 2014 → fork of Bit core created by mike Hearn.
Bit coin Diamond : 2017
Bitcoin Gold : 2017
Bitcoin Private : 2018

Soft forks do not result in a new currency, while hard forks are deeper changes within the blockchain and lead to new types of blockchain currency.

The different hard forks. of Bitcoin have wildly varied pricing and goals.

Q6)

Areas where supply chain management using blockchain can be applied.

① Replacing slow, manual processes.

② Strengthening traceability : increasing regulatory and consumer demand for provenance information is already driving change.

7

③ Reducing supply chain IT transaction costs. Bitcoin pays people to validate each block or transaction that requires people who propose a new block to include a fee in their proposal.

Example :- Skuchain builds blockchain based B2B trade and supply chain finance products targeted towards the trillion global trade finance market that involves numerous entities including buyers, sellers, logistics providers, banks and third parties.

Blockchain driven innovations in the supply chain will have the potential to deliver tremendous business value by increasing supply chain transparency, reducing risk and improving efficiency