IOT - 14

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SASTRA
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ANSWER BOOK

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2 supplements

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a																				
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Total																				
Grand Total - 39½																				

~~38½~~

Begin Answering Here

Part B

A.12) IOT Based Environmental Monitoring

→ Internet of Things (IOT) has been a great advancement in the field of technology

→ It establishes a connection between people, things and cloud

→ It uses sensors to detect the change in the environment and communicate the same to the devices using actuators

→ IOT has been used in many real time applications like

Smart irrigation, home automation

One Such Application of IOT is the IOT based environmental monitoring system

→ Keeping track of the environment is crucial for the well being and survival of humanity

For Example:

① If there is a leakage of poisonous gas in the environment then through IOT we can use gas sensors to check the concentration of gas and detect leakage and immediately alarm the industry to take immediate action thereby saving lives of people

② The above example was pertaining to survival of humanity

② Second Example is about Well being and Comfort.

of the People

So let us consider that the temperature in the room is increasing, then the temperature sensor will automatically intimate it to the Air conditioner IOT and switch it on and give comfort to the user who is sitting in the room

3) IOT can also be used to detect the ~~~~ onset of a natural calamity in the environment and intimate it to the people to save their lives

Thus IOT uses its components like

1. control unit
2. sensors
3. communication protocols
4. actuators

to sense the environment

Smart Irigation, Home Automation

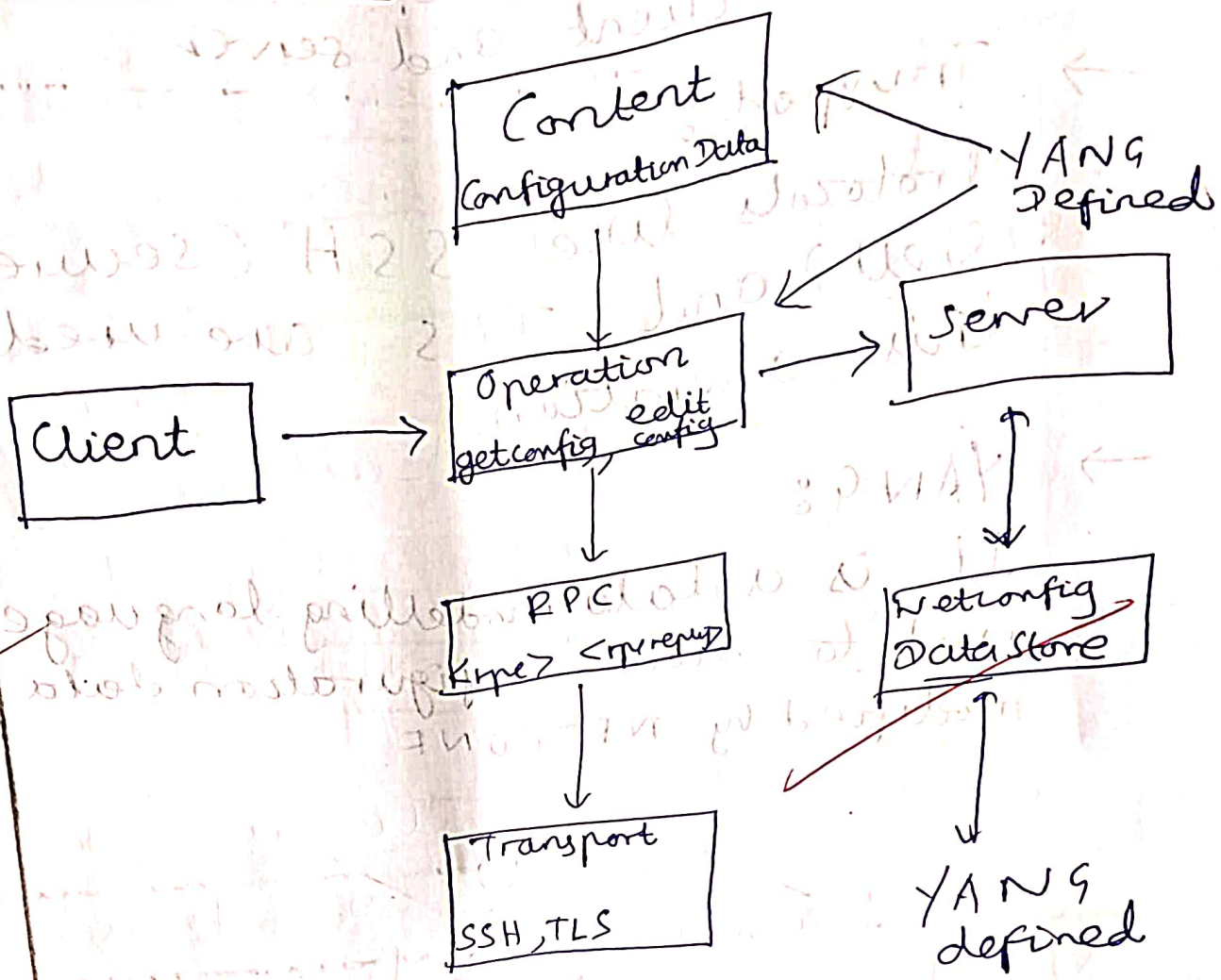
→ One such application of IOT is the IOT based environmental monitoring system

and contribute to well being and survival of humanity

A-13) A a) The requirements of Network Operator to address the limitations of existing Network Management Protocol

1) Automatic Configurability
2) Increased Reliability
3) Good Acknowledgement Mechanism
4) Increase the security in the network
5) Increase the supportability for many devices

NETCONF :



→ NETCONFIG is a network management protocol used to manage and manipulate the configuration data

→ It uses RPC (Remote Procedure Calls) between the client and the server

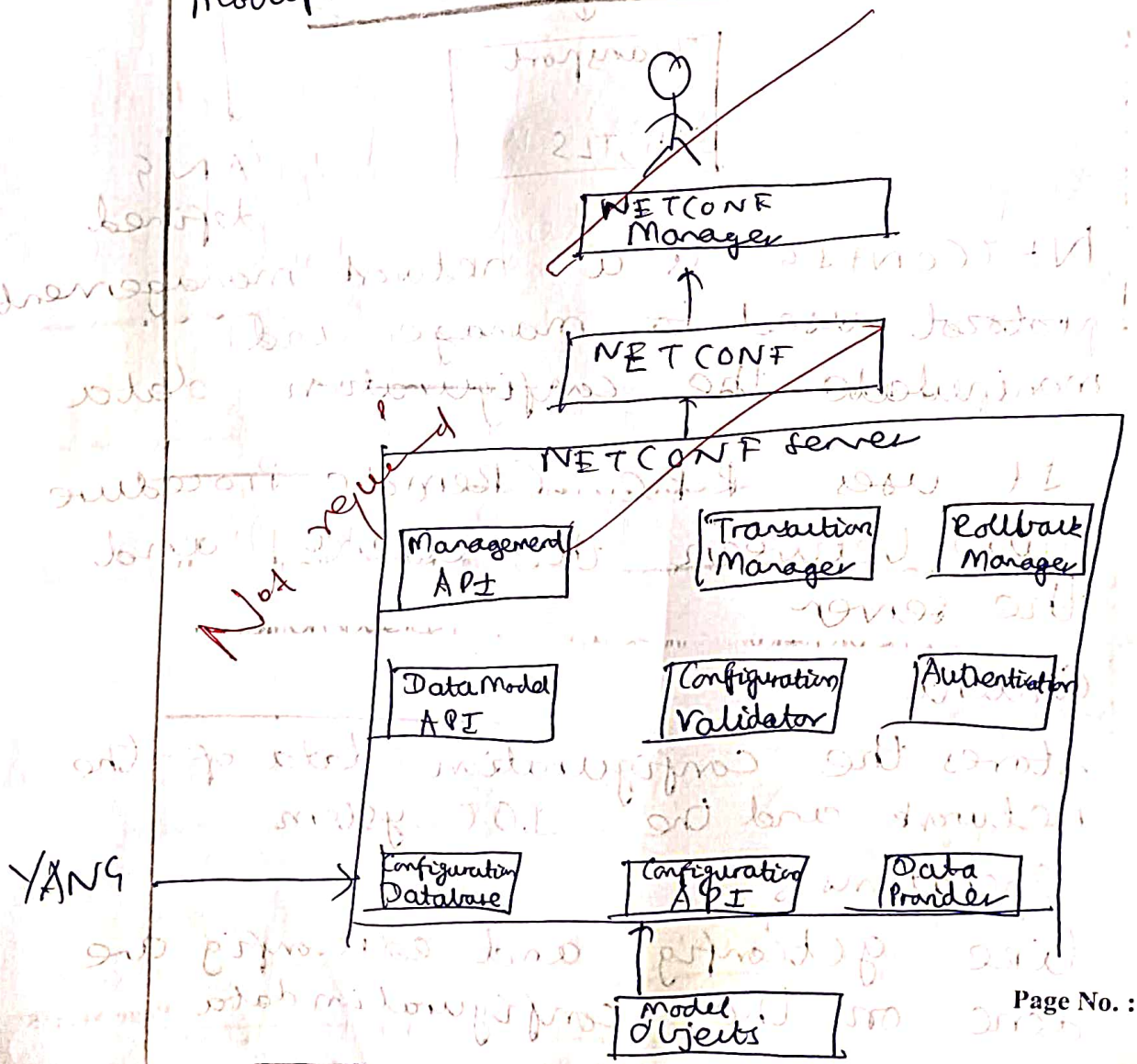
→ Content
stores the configuration data of the network and the IOT system

→ Operations
like getconfig and editconfig are done on the configuration data

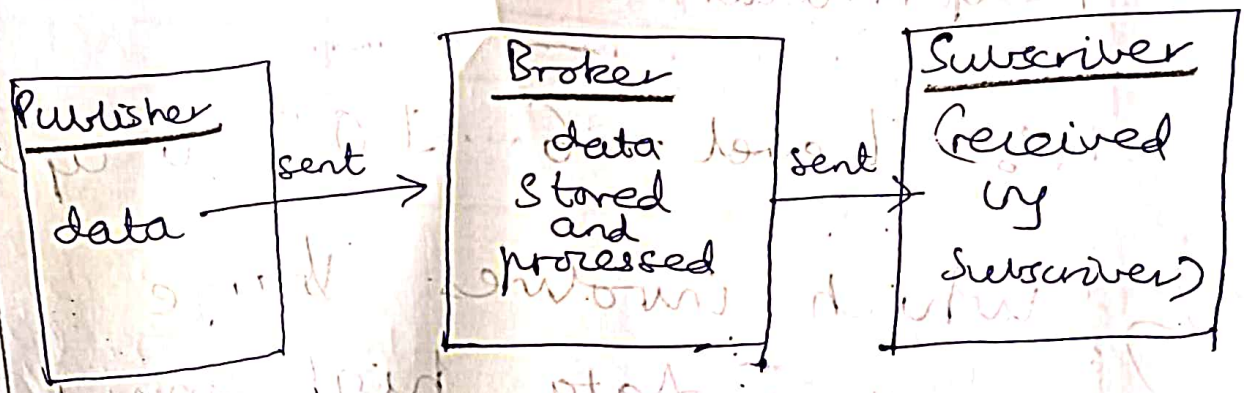
RPC:
used to establish communication between client and server

→ Transport:
Protocols like SSH (secure socket shell) and TLS are used in this operation

→ YANG:
It is a data modelling language used to store configuration data modified by NETCONF



A.a) There are 15 IoT devices and cloud between 2 IoT devices so cloud act as broker So, Publisher - Subscriber Model is apt for the given scenario



The publisher (an IoT device) sends data to the cloud (broker) and the other device called subscriber can actual fetch the results of processed data by subscribing to the cloud

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A.b) Since there are many nodes ie 15 nodes in the IoT System, Levels 4, 5, 6 are

suitable

But, there is cloud which is processing and storing the information and it is the one which is controlling the processing of data and also storing it and also delivers the data as IAAS

Information As a service

Level - 6	IOT is apt

which involves large amount of data, high computational intensity, multiple nodes, controller nodes to ensure proper functioning of the system

Part A

A.7) 1) WebSocket uses Exclusive Pair Communication Model

2) REST API's use Request Response Communication Model

A.4) IOT application layer protocols based on Publish-Subscribe are

1) MQTT
2) XMPP
3) DDS
4) AMQP.

Good

A.6) 1) Between SDN Controller and SDN application we have the North Oper API

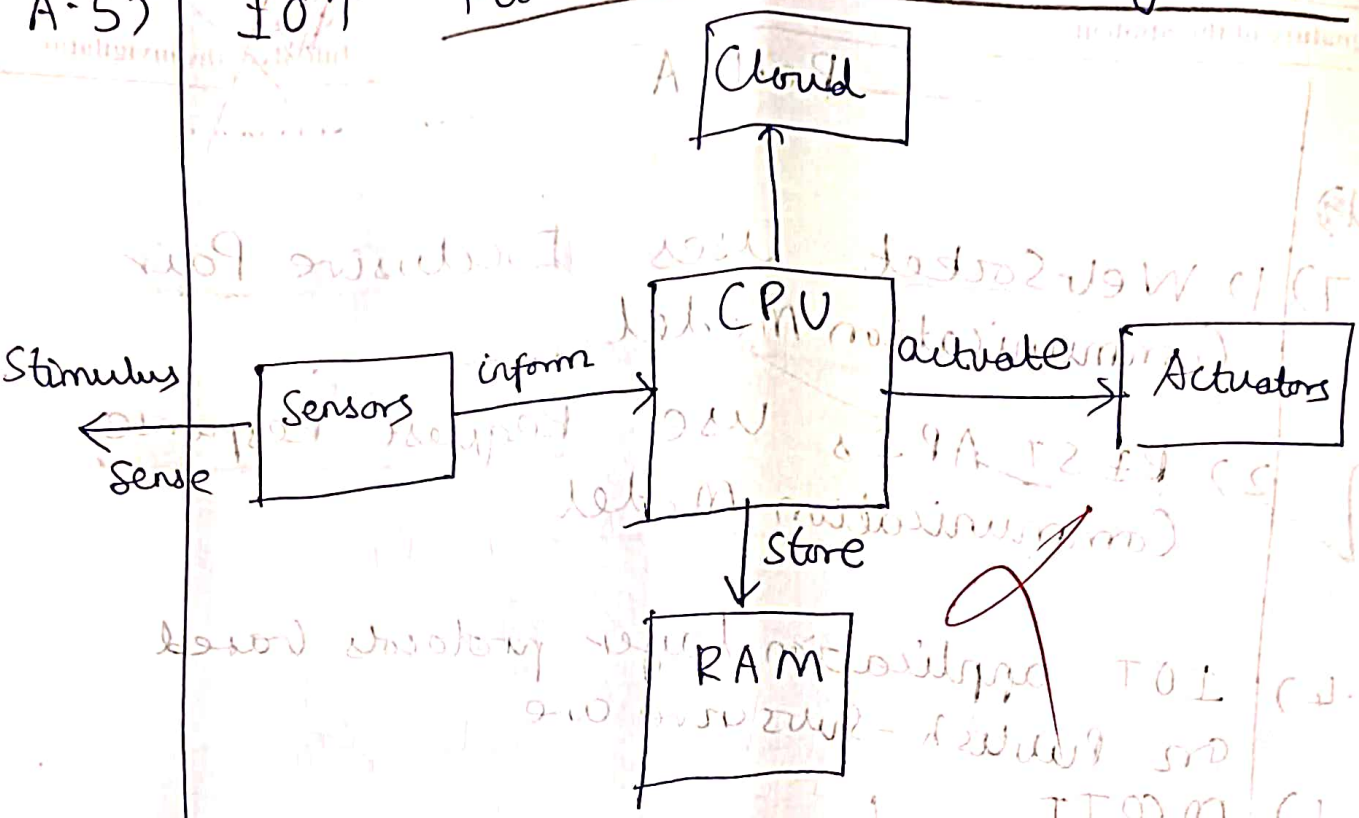
2) Between SDN Controller and network devices we have Openflow or South Oper API

A.10) RPC methods used by NETCONF

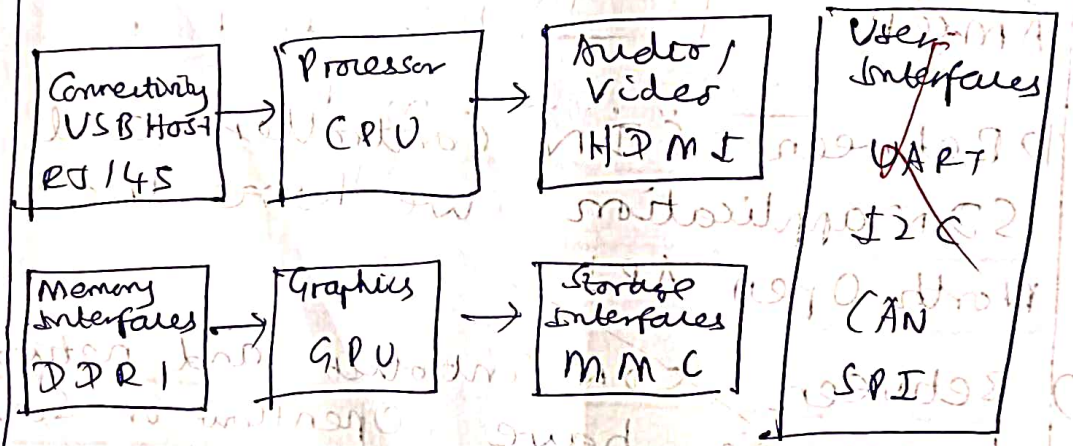
① getConfig()

② EditConfig()

A-5) IOT Functional Block Diagram



IOT interfaces



A-8)

	IOT	M2M
①	It uses network protocols like MQTT, COAP, DDS	① It uses network protocols like M-Bus, Wireless M-Bus, Mod-Bus
②	Area of Coverage is vast as	② Area of coverage is small as

ata stored in cloud	data is stored
nd can support	locally and
oud applications	used by local
	applications

A·1) IOT devices are dynamic and self-adapting

For example

In weather monitoring IOT system, the weather conditions change dynamically and there are chances for rise of new calamities so IOT devices handle these situations well and inform us because they are dynamic and self configurable and self-adaptable

A·3) Embedded devices like sensors, ~~embedded with~~ RFID tags with chips embedded in them are able to detect and

identify the person aptly because of the chip or embedded device in the RFID card which uses IOT protocols to communicate so embedded system is an IOT enabling technology

A.9) SNMP protocol does not support the need of

① Automatic Configurability
② Increased Reliability

ie SNMP is not re-configurable and it is unreliable so it is not used in configuration management

A.2) IEEE 802.3 is ethernet
802.3.i is Coaxial cable
802.3.j is fiber optic
IEEE 802.11 is wifi

So the standard number, the range, speed or data rate power are the parameters distinguishing them