For Office use	Space for Digital Data

தமிழ் நாடு அரசு

தொழில்நுட்பக் கல்வித் துறை. சென்னை 600 025 – வாரியத் தேர்வுகள்

அடுத்தப் பக்கத்தில் கொடுக்கப்பட்டுள்ள குறிப்புகளை படிக்கவும் (Read the instructions given in the next page)

Q. No.	A	B	C	Q. No.	A	B	C	Q. No.	A	B	C	Q. No.	A	B	C
1.				9.				17.				25.			
2.				10.				18.				26.			
3.				11.				19.				27.			
4.				12.				20.				28.			
5.				13.				21.				29.			
6.				14.				22.				30.			
7.				15.				23.				31.			
8.				16.				24.				Total Marks			

For Revaluation

For Central Valuation

Q. No.	A	B	C	Q. No.	A	B	C	Q. No.	A	B	C	Q. No.	A	B	C
1.	2			9.	1			17.				25.			
2.	2			10.	3			18.				26.			
3.	2			11.		10		19.				27.			
4.	0			12.		12		20.				28.			
5.	1			13.	10			21.				29.			
6.	2			14.		3+3		22.				30.			
7.	2			15.	8			23.							
8.	3			16.				24.							

591-1684-23506266

6A

Question Paper Code No. வினாத்தாளின் குறியீட்டு எண்	1	6	8	4

No. of Pages : எழுதப்பட்ட பக்கங்களின் எண்ணிக்கை 30.

Date of Examination : தேர்வு நாள் 14/11/2024

Subject Name : பாடத்தின் பெயர் Cloud Computing and Internet of Things

as a Service

* The Software is maintained by the cloud Provider

* The user has no need to download the Software.

தேர்வாளர்களுக்கான அறிவுரைகள்
INSTRUCTIONS TO CANDIDATES

1. விடைத்தாள் மாற்றிப் பெறுவதற்கு.
   Get the answer book replaced, if
   - விடைத்தாள் சரியாக சேர்ந்து பின் செய்யப்படாமல் இருந்தால்.
   - it is not stapled properly
   - விடைத்தாள் புத்தகப் பக்கங்களின் வரிசை எண் விடுபட்டிருந்தாலோ அல்லது வரிசையாக இல்லாமலிருந்தாலோ (மொத்தம் 30 பக்கங்கள்).
   - the page numbers are missing or not in order (there shall be 30 pages continuously numbered)
   - தலைப்பு பக்கத்தில் விடைத்தாள் புத்தகத்தின் கீழ்பகுதியில் வரிசை எண் அச்சிடப்படாமலிருந்தால்.
   - the serial number of the answer book is not printed at the bottom of the title page
2. உங்களுடைய பதிவு எண்ணையும், பெயரையும் அதற்காக கொடுக்கப்பட்டுள்ள தலைப்பு பக்கத்தின் கீழ்பகுதியில் மட்டும் எழுதவும்; அதைத் தவிர்த்து பதிவு எண், பெயர் ஆகியவற்றை விடைத்தாளில் மற்றப் பக்கங்களில் எழுதக்கூடாது. எந்தவிதமான அடையாளக் குறியீட்டையும் விடைத்தாளில் எழுதக்கூடாது.
   You are prohibited from writing your REGISTER NUMBER or NAME in any part of the answer book, other than the space provided at the bottom of the title page. You are prohibited from writing or leaving any distinguishing marks so as to identify your answer book.
3. தலைப்புப் பக்கத்தில் கொடுக்கப்பட்டுள்ள அதற்குரிய கட்டங்களில் விவரங்களை எழுதவும்.
   Fill up all the particulars, in the relevant boxes, in the title page.
4. கேள்விகளுக்கு பதில் எழுதும் போது விடைத்தாளில் இரண்டு பக்கங்களையும் பயன்படுத்த வேண்டும். பக்கங்களில் தொடர்ந்து விடை எழுதாமல் வெற்றிடம் விடக் கூடாது.
   Use both sides of the paper for answering questions, without leaving spaces/ lines in between.
5. இந்த விடைத்தாள் புத்தகம் போதுமான பக்கங்களை கொண்டிருக்கிறது. இதைத் தவிர கூடுதல் விடைத்தாள் அளிக்கப்படமாட்டாது.
   This answer book contains sufficient pages and no additional sheets will be issued.
6. கேள்விக்கு விடையளிக்கும் முன்பு வினாத்தாள் எண், வருடம், மாதம், காலம் இவைகளை சரிபார்க்கவும்.
   Check the Code Number, Month and year of Examination, Duration etc., in the question paper before answering the questions.
7. கொடுக்கப்பட்டுள்ள வரைப்படத்தாள் / கிராப் ஷீட் தவிர வேறு எந்த விடைத்தாளையும் சேர்க்க கூடாது. விடைத்தாள் புத்தகத்திலிருந்து எந்த பக்கத்தையும் கிழிக்கக் கூடாது.
   No extra sheet is to be attached except the drawing/graph sheets supplied and no sheet is to be teared from the answer book.
8. கைபேசி, துண்டுக் காகிதம் மற்றும் தடை செய்யப்பட்ட இதர பொருட்கள் வைத்திருத்தல், தேர்வுக்கு எதிரான முறைகேடுகளில் ஈடுபடுதல் அனைத்தும் தேர்வு வாரிய விதிகளின்படி தண்டனைக்குரிய குற்றமாகும்.
   POSSESSION OF ANY PROHIBITED MATERIAL, CELL PHONE, BITS OF PAPERS, etc., AND INVOLVEMENT IN MALPRACTICE OF ANY NATURE SHALL BE PUNISHABLE AS PER BOARD'S RULES.

Part - B.

11. b).

Cloud Scenarios

* The cloud Scenarios decide the Exact type of the service Provided by the cloud.

* The following are the cloud Scenarios

i) Saas (Software as a service)
ii) Paas (Platform as a service)
iii) Iaas (Infrastructure as a Service)

Saas

* The Saas Provides a working Software as a service

* The Software is maintained by the cloud Provider

* The user has no need to download the Software.

* Using internet the user can access the Software

* The Software doesn't relay on the resource of the local Computer.

&

Paas

* The Paas Provides a platform for the developers

* The developer can develope and deploye a web application using the Servis

* The platform contains advance level of tools

* Using the platform less Skilled Programmers can also develope.

Eg: Google app Engine

Iaas

* Iaas is a method of Providing Computer Resources as Service

* The main resource that is provided by the cloud is Storage.

* The user can use this storage as Pay-as-you-go

* The Iaas helps to lower the Expenses on buying Computer Physical resources.

* The Iaas can rapidly Expandable and also can be Shrinkable.

Example : Amazon Ec2

* Amazon Elastic cloud Computing provides Computer resource for End user.

* The user can buy a instance of AWS and access the resource.

* The user will be charged monthly based on the resource he is used.

Web Service

* A Software, application or cloud technology that use a standard web protocal (http or https) for interconnect and operate to Exchange data is known as web Service.

* Basically Xml (Extensible Markup language) is said to be a web Service.

Components

The basic platform is http + Xml and Every web Service work using the Following Component

i) Soap (Simple object access Protocal)
ii) UDDI (universal description, and discovery) and integration
iii) WSDL (web Service description language)

Types of web Service

The Following are the types of web Services.

i) Soap web Service
ii) RESTful web Service.

Soap web-Service

* Soap is used For transferring Messages among others.

* Soap is a Protocol based Service

Advantage

i) WS Security
ii) language Independent

RESTful web Service

* It is not a Protocol it is a Architectural Style.

Advantage

i) Fast
ii) can use Soap
iii) WS Security
iv) language and hardware Independent

12. b)

* The cloud deployment model helps to understand the infrastructure of a cloud.

* The cloud deployment also shows the information on who can access the cloud, what type of cloud and the working of the cloud.

* The following are the different cloud deployment model.

i) Public cloud
ii) Private cloud
iii) Community cloud
iv) hybrid cloud.

i) Public cloud.

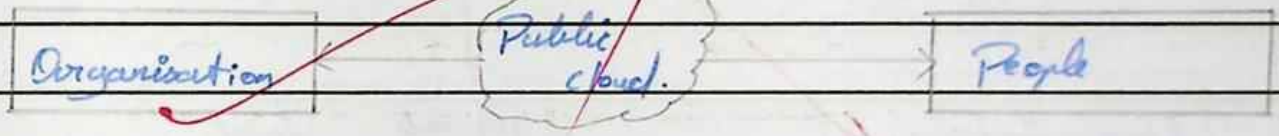
* Public cloud provides services for any one. Such as People and organisation

* Public cloud is open for the general Public so it is not safe.

* Anybody can access the services in a quick and simple process

* It is a best Example for cloud hosting

* Some Services are Free and Some of them are Pay-as-you-go or Subscription Model.



Example : GAE, Amazon Ec2 etc...

ii) Private cloud.

* Private cloud is a Exact opposite of the Public cloud.

* Private cloud is For one or one, which means it is not a open cloud.

* Private cloud are used by organisation For data Security.

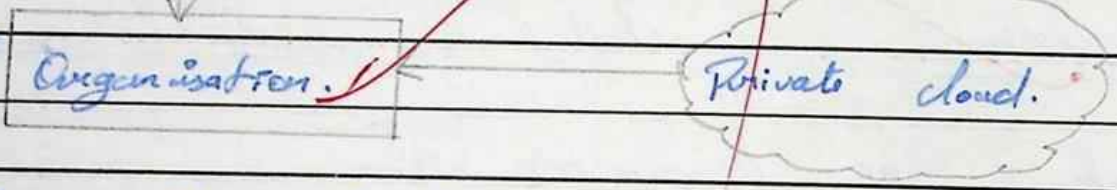
Advantage

1) Better Secure.

ii) Customize.

* In Private cloud the user does not need to share his resource

* Private cloud is best For Sensitive information Processing.



iii) Community cloud.

* Community cloud Provides Service For Organisation

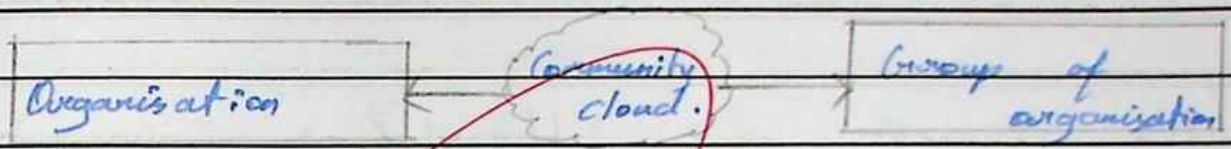
* This Model cloud is Shared among organisation that has Similar intrest

* The cloud Model is Managed by Third Party or group of Organisation

Advantage

i) Communication
ii) Security.

iii) lower cost



iv) Hybrid cloud.

* Hybrid cloud is a combination of two or more clouds

* The hybrid cloud acts as a bridge between clouds.

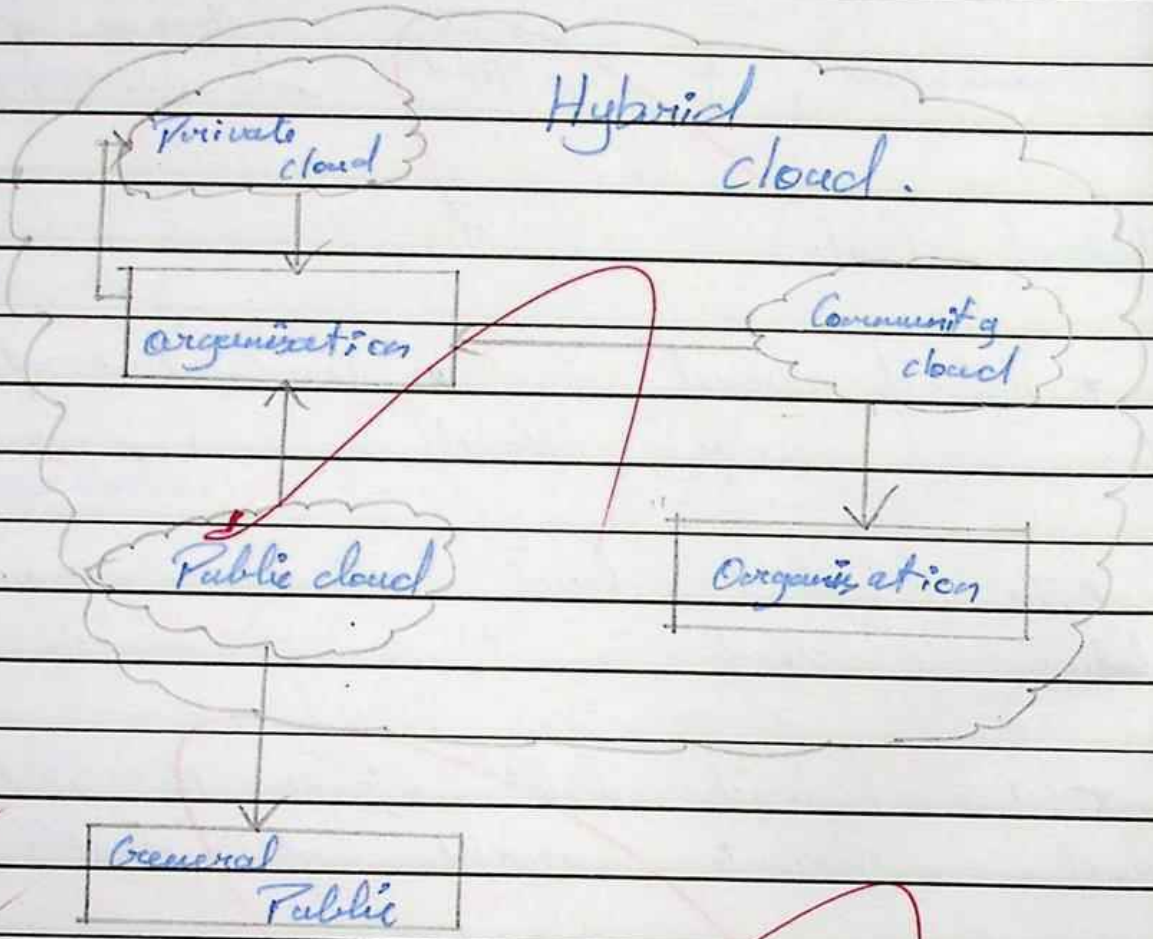
* The hybrid cloud joins the public and private world of cloud.

* Using hybrid cloud the data can be secure

* The users can transfer data from one cloud to another cloud.

* This solves the security problem of public cloud and make a way for sensitive and sharable data to be separated.

Hybrid cloud.



* As shown in the above figure the hybrid cloud is a combination of two or more cloud.

* The data can be flow anywhere from anyone within the hybrid cloud.

13. b) CSA

* cloud Security Alliance is an organisation, they study about the security of cloud computing.

* CSA is a non-Profitable organisation, so anybody can access their studies in their home Page.

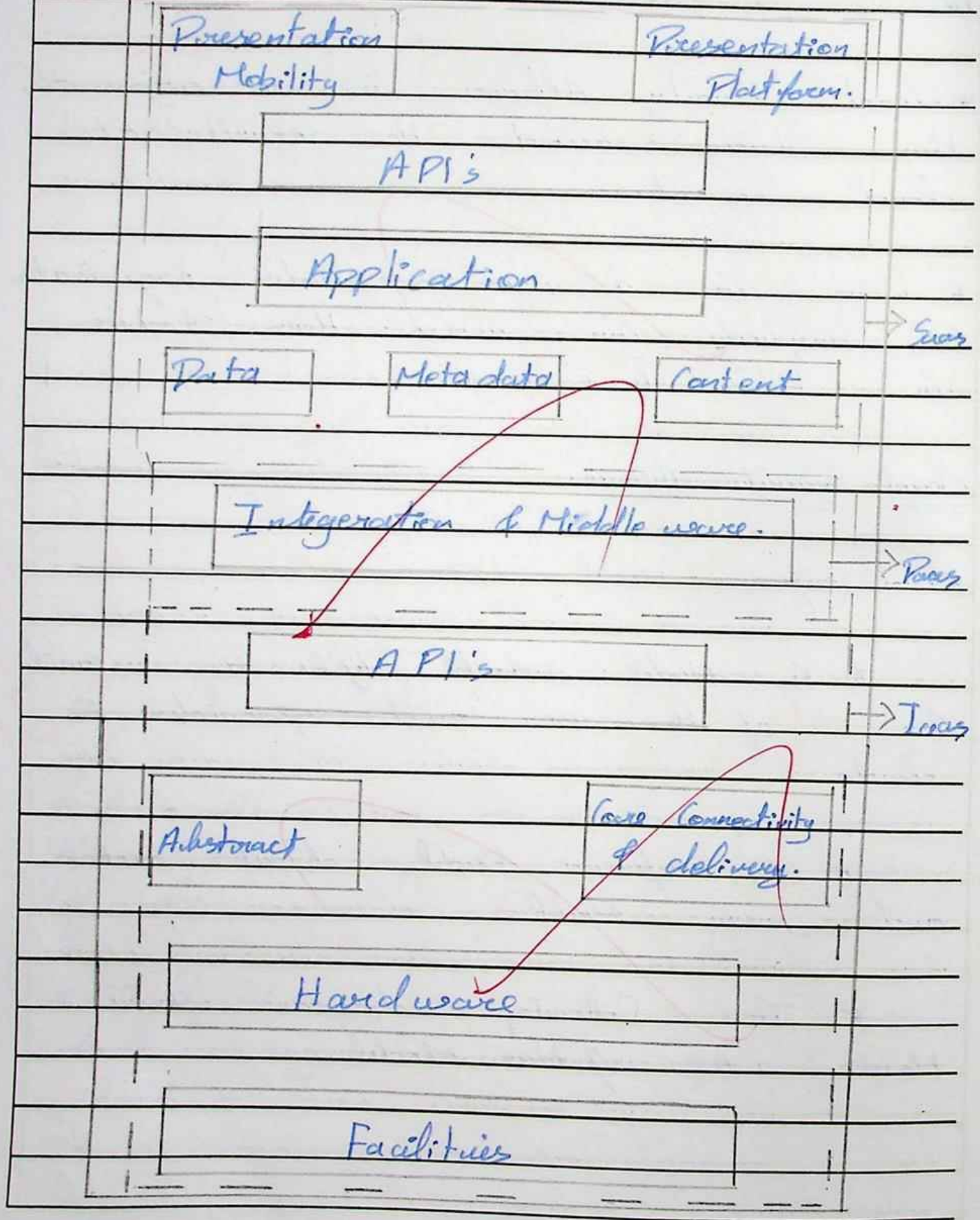
Cloud Security Alliance.

Cloud reference Model

* A Model should define the responsibility of the user and Provider in cloud.

* CSA reference Model describes each and every Model.

* The following diagram shows the CSA reference Model.


Presentation Mobility
Presentation Platform.
API's
Application
Saas
Data
Meta data
Content
Integeration & Middle ware.
Paas
API's
Iaas
Abstract
Core Connectivity & delivery.
Hardware
Facilities

* The Iaas has the least Security and the Paas and Saas has More Security.

* All the level inherit some of the Security Concern and Property from the beneath level

* Iaas Provides Computer hardware resource as service.

* Paas Provides a Platform for application developing and deploying

* Saas Provides a Software that Can Run using internet.

* Iaas has the least integerated Functionality and integerated Security.

* Paas has the Average integerated Functionality and integerated Security.

* Saas has the highest level of integerated Functionality and integerated Security.

* This shows where the Provider responsibility.

and user responsibility starts.

Securing data

* Data are sent to the cloud and receive from the cloud and also stored in the cloud.

* The security of this data are the main concern of the provider.

* In WAN traffic any data can be changed.

* The WAN traffic should be Encrypted.

* Each user's data should be Encrypted.

The Following are the Key Factors For Security

i) Access Control.
ii) Auditing
iii) Authentication
iv) Authorization.

Access Control

* Access Control is used to check whether the user is allowed to access the data.

Auditing.

* Auditing is a Process of Monitoring the user For taking precautions.

Authentication

* Authentication is used to check whether the user is authorized

* Authentication alone is not effective

Authorization

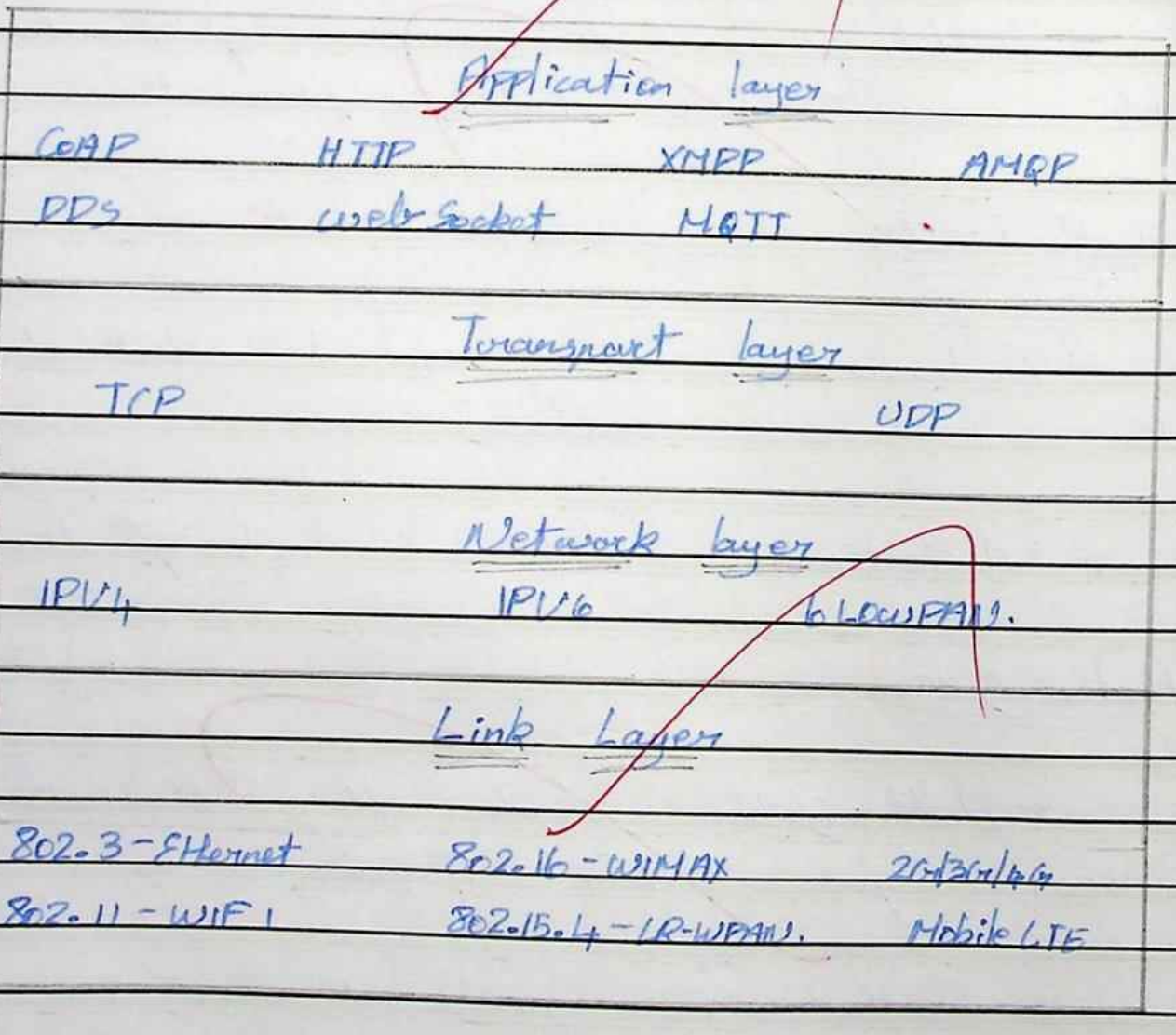
* Authorization checks the authenticated user for their Privilage.

* Authentication and Authorization are the important Factor of Security.

14. b) i)

* The IoT communication protocol establish a connection between the node device and Server.

* The protocols are present in both Server and client side.



Network layer

* The network layer send IP datagram From Source to destination network.

* The network layer is responsible for

i) host addressing.

ii) Packet Routing.

* The datagrams contains the Source and destination

* The routing is done using the address in the datagram.

* host addressing is done by IPV4 or IPV6.

IPv4

* It is the most widely used network Protocal

* It helps to address the network.

devices

* It uses a 32 bit address total of 2^{32}

Ipv6

* Ipv6 is the Successor of the Ipv4

* Ipv6 uses a 128 bit address for hosting and a total of 2^{128}.

14- b) ii)

The Following are the IoT Enabling technologies

i) Wireless Sensor network.
ii) Big data Analytics
iii) cloud Computing
iv) Communication
v) Embedded System.

Wireless Sensor Network

* A WSN Consist of End Node, routers and Coordinators

* The End-node has number of Sensor Connected to them.

* The End-nodes can also act as routers.

* The routers are responsible for routing the End-nodes to Coordinators

* The Coordinators act as a gateway for WSN to Connect to the internet.

* The WSN is enable using wireless IEEE 802.15.4

IEEE 802.15-4

* It is a wireless Standard of Low Rate - wireless Personal area network For link layer.

* It has a speed of 40KBs to 250KBs.

Example

i) Smart light

* The WSN is used to automate the light based on the brightness of the Environment.

* LDR Sensor is used for the following Process.

ii) Temperature

* The temperature is Sensed using a Sensor and the data is upload to the Server to process the data.

* The temperature LM35, humidity DHT11 are used to Sense the Environment changes

15. a)

* The Process Specification is the 8th Step in IoT Methdology.

* In this Step the Process is Specified

* The some of the options are :-

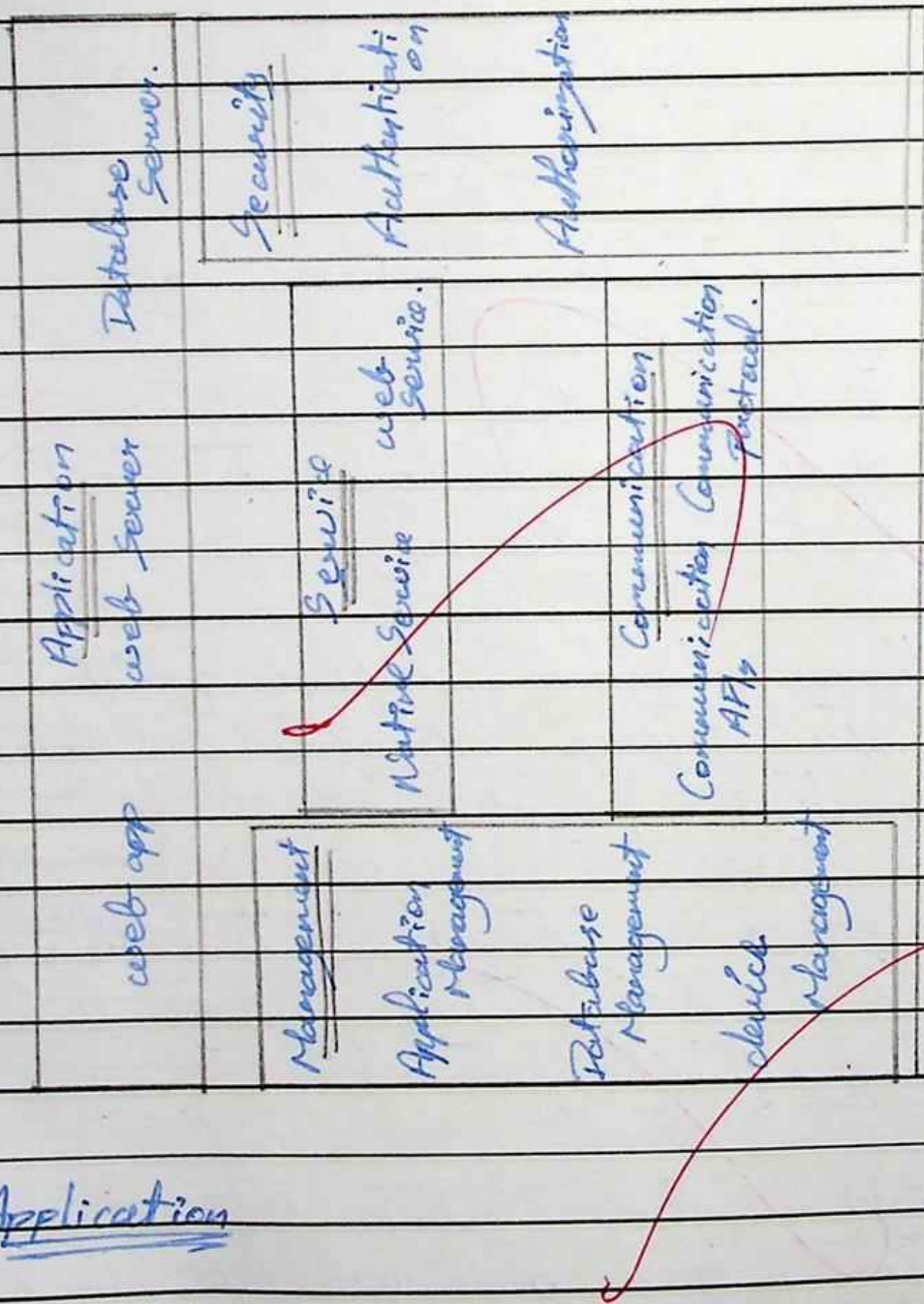
i) Storage option
ii) Application Service options
iii) Device options

* The following diagram and the points shows the process Specification for a Smart light Project

* Smart light Project allows the user to access their light using their heterogeneous devices.

* The light also contains auto mode and can turn on and off based on the Environment light.

* Each and Every Component name and usage is mentioned in points



Application

* The Software use use is given below.

i) web app - django web app

ii) web - Server - django web Server

iii) Database Server - Mysql database Server

Service

* The Service used for the Projects are

i) Native Service - node Controller.

ii) web Service - Node REST, Stats REST

Communication

* The Communication API is REST API

* The Communication Protocols are:-

i) Link layer
ii) Application Layer
iii) Network layer.
iv) Transport layer.

Device

The devices are given below.

i) Actuator - Relay Switch.

ii) Sensor - LDR

iii) Computing device - Raspberry pi.

Raspberry Pi

* It is a Credit Card sized Computing device

* It has ARM Processor and it can process any data as a desktop.

Management

i) Application Management - Django application Management

ii) Database Management - Mysql Database Management

iii) Device Management - Raspberry Pi device Management

Security

i) Authentication - web app, database.

ii) ~~Authentication~~ Authorization - web app, database.

* The following are the process specification for a Smart light Project.

Part - A

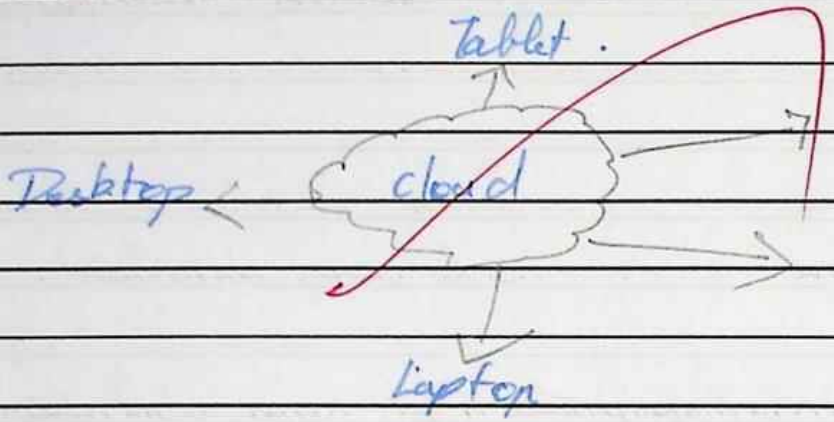
1. * cloud computing is a process of providing computer resource, platform and software from the users.

* The user can use and access the cloud through internet.

* The main demand in cloud is for storage.

* large volume of storage can be accessed

and charged based on the resources.



2. * The data are sent to the cloud and Receive from the cloud.

* The Security of data is ~~was~~ the main Concern of bothe user and Provider

* Using WAN traffic any data can be Modified

* The Following are some Precautions

i) Avoid Storing Sensitive data.
ii) Be Serious about passwords.
iii) Read the provider aggrement
iv) choose the Provider wisely.

3. * Platform as a service is providing a platform for developing software

* The following are some of the Providers

i) Google app Engine (GAE)

ii) Adobe

iii) Microsoft. office

iv) Cogrid.

4. * Providing a physical computer resource virtually as a service to the End users is called Iaas (infrastructure as a Service)

Advantage

i) Scalability

ii) Low cost

Example : Amazon Ec2.

5. * Encryption is a process of converting the data into a non-readable form based on a Mathematical algorithm.

* Only who has the key to decrypt can read the data.

* The following are the types:-
  i) Data-in-transit
  ii) Data-at-rest.

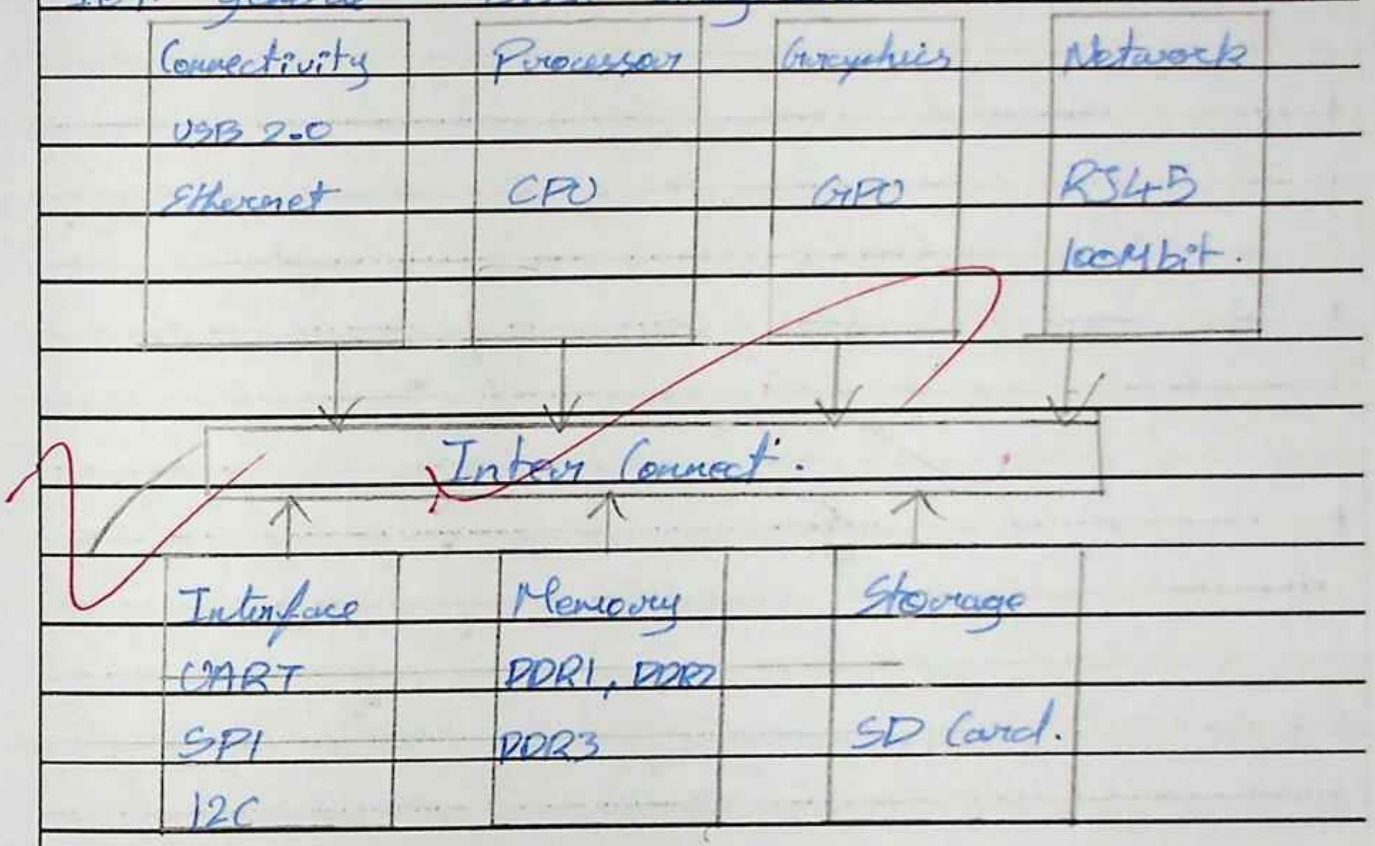
6. * Virtualization Security Management is a Operating system dedicated to Security.

* The VM Machines are working using Multi-Tenant Model.

* So the resources are shared, so there is a possibility of Dos attacks.

* The Virtualization Security Management is used to reduce this following threats.

7. * The Following diagram shows the IoT- generic block diagram.



8. * There are Six IoT levels they are:-

i) IoT Level-1
ii) IoT Level-2
iii) IoT Level-3
iv) IoT Level-4
v) IoT Level-5
vi) IoT Level-6.

9. * The integrating device is the ninth's step of IoT Methodology.

* The device can be integerated using wire or wireless.

* The Sensors can be on board or any where.

* Breadboard helps to interconnect the devices.

* After the connection application is developed. For the IoT project.

10. * The most widely used operating system for Raspberry pi is RISC OS.

* The Following are the RISC OS Command.

i) MKdir - To create a directory.

ii) run. - To

iii) Card - To get the directory.