CC Week 8

Docker is a container management service. Main features of Docker are develop, ship and run anywhere. We can deploy Docker containers anywhere, on any physical and virtual machines and even on the cloud.

• Since Docker containers are pretty lightweight, they are very easily scalable.

QUESTION 1:

Docker compose is a tool for defining and running multi-container Docker applications.

a) True

b) False

Correct Answer: a

Detailed Solution: Docker compose is a tool for defining and running multi-container

QUESTION 2:

Choose the most appropriate option.

Statement 1: An image is a lightweight, stand-alone, executable package that includes everything to run a piece of software.

Statement 2:Container is a run time instance of an image.

a. Statement 1 is correct but Statement 2 is incorrect

b. Statement 2 is correct but Statement 1 is incorrect

c. Both the statements are correct

d. Both the statements are incorrect.

Correct Answer: c

Detailed Solution: Both the statements are correct. Lecture 36, 20:51 min

QUESTION 3:

Vehicles providing their networking and data processing capabilities to other vehicles through the cloud comes under which service of IoT-based Vehicular Data Clouds.

a. SaaS

b. PaaS

c. IaaS

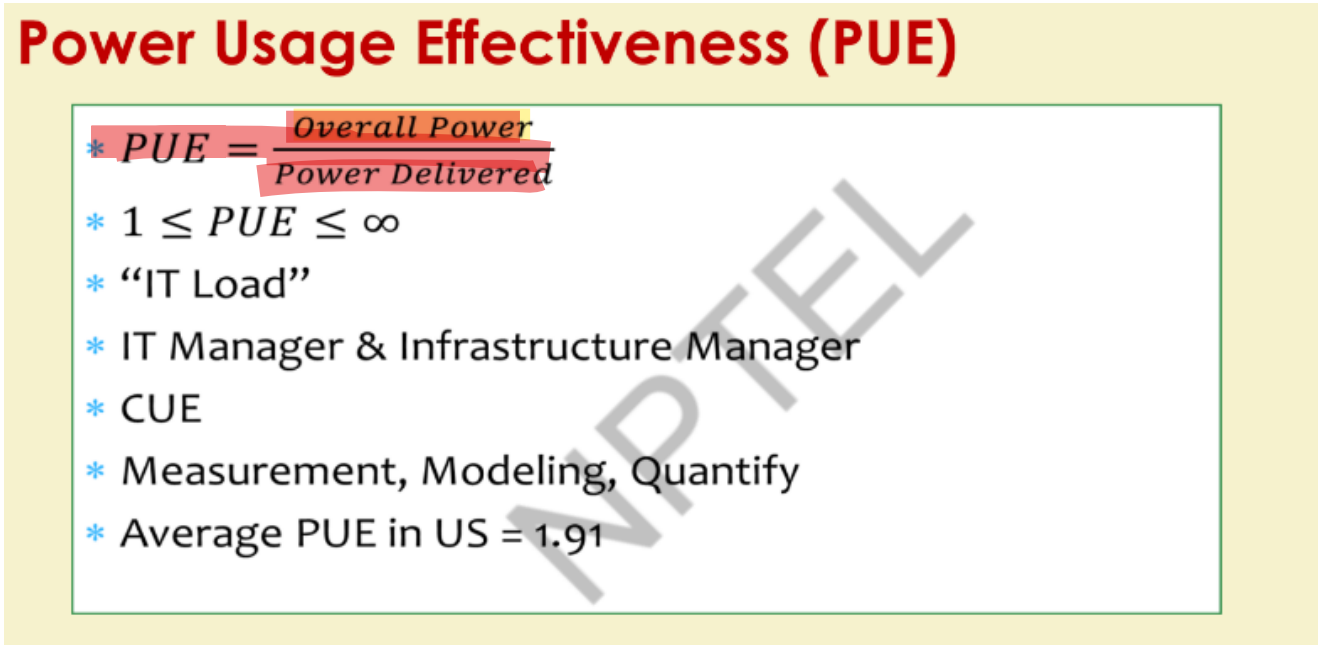
d. None of these

Correct Answer: c

Detailed Solution: Vehicles provide their networking and data processing capabilities to other vehicles through the cloud comes under the Networking and Data processing as a service (IaaS)

Green computing is the environmentally responsible and eco-friendly use of computers and their resources.

Power Usage Effectiveness (PUE): This is a measure of how efficiently a data center or a cloud computing facility uses energy.



QUESTION 5:

In the context of Green Cloud Computing, the Power Usage Effectiveness is defined as
a. Power Delivered / Overall Power
b. Overall Power / Power Delivered
c. Overall Power * Power Delivered
d. None of these

Correct Answer: b
Detailed Solution: In the context of Green Cloud Computing, the Power Usage Effectiveness is defined as Overall Power / Power Delivered. So, the correct option is (b). Lecture 37, 28:45 min.

1. **Sensor-Cloud Proxy**: Imagine you have a bunch of sensors gathering data, like temperature sensors in a smart home or motion sensors in a security system. These sensors collect information. Now, a Sensor-Cloud Proxy acts like a bridge between these sensors and the cloud. It helps in sending the data collected by these sensors to the cloud, where it can be stored, processed, and analyzed.
2. **Sensor Network**: This simply refers to a network of these sensors.
3. **Sensor-Cloud Interface**: Think of this as a control center in the cloud where you can manage and interact with your sensor network.

QUESTION 6:

Statement 1: Sensor-Cloud proxy exposes sensor resources as cloud services.

Statement 2: Sensor network is still managed from the Sensor-Cloud Interface via Sensor Network Proxy

a. Statement 1 is True and Statement 2 is False

b. Statement 2 is True and Statement 1 is False

c. Both statements are True

d. Both statements are False

Correct Answer: c

Detailed Solution: Sensor cloud proxy exposes sensor resources as cloud services. Sensor network is still managed from the Sensor-Cloud

QUESTION 7:

Which of the following statements is/are true about Docker ?

Statement 1: Docker hub is used for building docker images and creating docker containers.

Statement 2: Docker compose is a registry used to host various docker images.

a. Statement 1 is correct but Statement 2 is incorrect

b. Statement 2 is correct but Statement 1 is incorrect

c. Both the statements are correct

d. Both the statements are incorrect.

Correct Answer: d

Detailed Solution: Docker Engine is used for building docker images and creating docker containers. Docker Hub is a registry used to host various docker images.

So, the correct option is (d). Lecture 36,17:34.

Sensor data can be easily shared by different groups of users without any extra effort/ measure.

a. True

b. False

Correct Answer: b

Detailed Solution: One of the limitations of Sensor Networks is “Sensor data can not be easily shared by different groups of users.” Hence, the correct option is (b). Lecture 38, 9:32 min.

_____ get virtual access to host resources through a hypervisor.

a) Containers

b) Virtual machines

c) Both a and b

d) Images

Correct Answer: b

QUESTION 10:

_____ enables different networks, spreads in a huge geographical area to connect together and be employed simultaneously by multiple users on demand.

a) Serverless

b) IoT Cloud

c) Sensor Cloud

d) Green Cloud

Correct Answer: c

Detailed Solution: Sensor Cloud enables different networks, spreads in a huge geographical area to connect together and be employed simultaneously by multiple users on demand. Lecture 38, 20:27

QUESTION 1:

For sensor resources that do not have direct connection to the cloud, sensor network proxy provides the connection.

a) True

b) False

Correct Answer: a

Detailed Solution: For sensor resources that do not have direct connection to the cloud, sensor network proxy provides the connection. So, the correct option is (a). Lecture 38, 22:10 min.

QUESTION 2:

Docker compose is a tool for defining and running multi-container Docker applications.

a) True

b) False

Correct Answer: a

Detailed Solution: Docker compose is a tool for defining and running multi-container Docker applications. So, the correct option is (a). Lecture 36, 18:17 min.

QUESTION 3:

What does "**ps**" signify as per Container terminology?

a) List of all containers

b) List of all running containers

c) List of all stopped containers

d) List of all warm containers

Correct Answer: b

Detailed Solution: ps : list all running containers

ps -a : list all containers (including stopped). Lecture 36, 29:58 min.

QUESTION 5:

Choose the most appropriate option.

Statement 1: An image is a lightweight, stand-alone, executable package that includes everything to run a piece of software.

Statement 2:Container is a run time instance of an image.

a. Statement 1 is correct but Statement 2 is incorrect
b. Statement 2 is correct but Statement 1 is incorrect
c. Both the statements are correct
d. Both the statements are incorrect.

Correct Answer: c

Detailed Solution: Both the statements are correct. Lecture 36, 20:51 min

QUESTION 7:

An IoT platform's basic building blocks is/ are (choose the correct option(s)).

a. Gateway
b. Images
c. Network and Cloud
d. Containers

Correct Answer: a, c

Detailed Solution: An IoT platform has three basic building blocks, Things, Gateway, and Network and Cloud. Lecture 39, 10:09 min.

QUESTION 8:

Docker rmi is used to delete a local _____

a. image
b. container
c. volume
d. node

Correct Answer: a

Detailed Solution: Docker rmi is used to delete a local image. So, the correct option is (a).

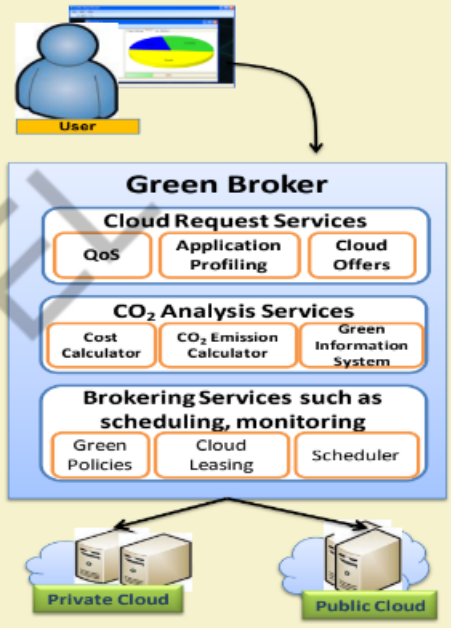
Match the following two tables

Table – I [Layers of Green Broker]	Table – II [Responsibilities of Green Brokers]
1. 1st layer	i. Carbon aware scheduling
2. 2nd Layer	ii. User requirements analysis
3. 3rd Layer	iii. Calculation of cost and carbon footprint of services

Green Broker

A typical Cloud broker
- Lease Cloud services
- Schedule applications

Green Broker
- 1st layer: Analyze user requirements
- 2nd layer: Calculates cost and carbon footprint of services
- 3rd layer: Carbon aware scheduling



3) Consider the following two statements:
Statement 1: Docker containers are pretty lightweight but they are not easily scalable.
Statement 2: Containers can share the OS kernel with other containers

a. Statement 1 is True and Statement 2 is False
b. Statement 2 is True and Statement 1 is False
c. Both statements are True
d. Both statements are False

5) In the context of Green Cloud Computing, overall power used in datacenter is 90 units and power delivered to computing equipment is 75 units. What will be the effectiveness of power usage?

a. 15
b. 5
c. 5/6
d. 6/5

- [ ] a.
- [ ] b.
- [ ] c.
- [ ] d.

No, the answer is incorrect.
Score: 0
Accepted Answers:
d.

Statement 1: Virtual sensors provide a customized view to users using distribution and location transparency.
Statement 2: In sensor cloud,physical sensors contain metadata about the virtual sensors and user currently holding that physical sensors.

a. Statement 1 is TRUE and Statement 2 is FALSE
b. Statement 2 is TRUE and Statement 1 is FALSE
c. Both statements are TRUE
d. Both statements are FALSE

ans a

- **Virtual Sensors**: These are software-based representations or abstractions of physical sensors. They don't exist physically but are created to provide a specific view or functionality to users.
- **Distribution and Location Transparency**: This refers to the ability of a system to hide the details of where data is located or how it's distributed, making it appear as if all resources are locally available to users regardless of their physical location.
  the metadata is not stored in physical sensor but in the cloud directly.

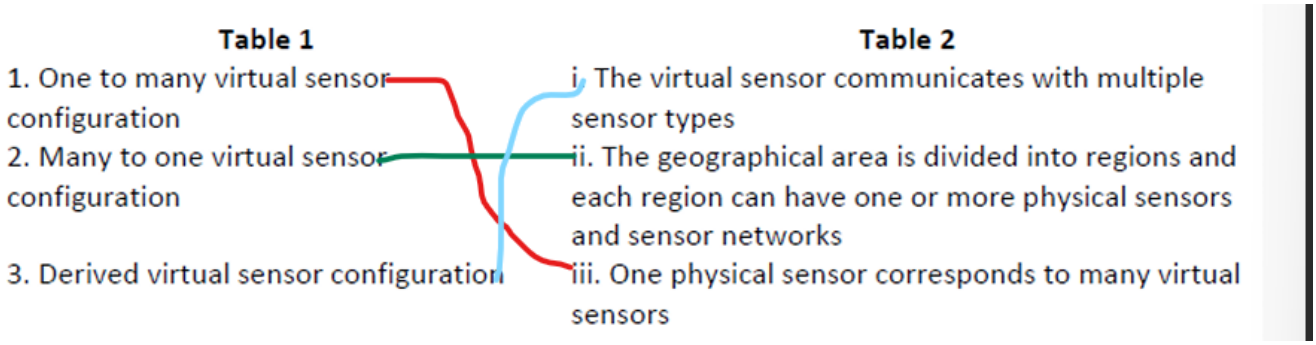
8) Which of the following(s) is/are aspect(s) of IoT systems?

a. Homogeneous systems
b. Functions in Real Time
c. Not scalable
d. Widely Distributed

- [ ] a.
- [ ] b.
- [ ] c.
- [ ] d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.
d.



10) A typical IoT based vehicular data cloud offers a variety of cooperative information services, like traffic information, parking availability etc., which can be termed as

a. Network as a Service
b.Platform as a Service
c. Storage as a Service
d. None

- [ ] a.
- [ ] b.
- [ ] c.
- [ ] d.

No, the answer is incorrect.
Score: 0

Accepted Answers:
b.

Sl No	Ques
1	The major feature(s) of Docker is/are: a) Model b) Develop c) Run anywhere d) Debug **Ans: b,c**
2	Statement 1: Docker Engine is used for hosting various Docker images. Statement 2: Docker Hub is used for building Docker images. a) Statement 1 is TRUE and Statement 2 is FALSE b) Statement 1 is FALSE and Statement 2 is TRUE c) Both statements are TRUE d) Both statements are FALSE **Ans: d**
3	Multiple docker containers can run on the same machine and share the OS kernel with other containers a) TRUE b) FALSE **Ans: a**
4	Energy Consumption of a typical Data Center (DC) consists of: a) Cooling System b) IT Equipment c) Power Distribution d) Security Methods **Ans: a,b,c**

Two-tier DC architecture

- Access and Core layers
- 1 GE and 10 GE links
- Full mesh core network
- Load balancing using ICMP

DC Architecture - Present

Three-tier DC architecture

- Most Widely Used Nowadays
- Access, Aggregation, and Core layers
- Scales to over 10,000 servers

5	Statement 1: Two-tier DC architecture consists of Aggregation and Core layers. Statement 2: Three-tier DC architecture consists of Access, Aggregation and Core layers. a) Statement 1 is TRUE and Statement 2 is FALSE b) Statement 1 is FALSE and Statement 2 is TRUE c) Both statements are TRUE d) Both statements are FALSE **Ans: b**

6	The dynamic part of DC server energy model is primarily contributed by a) CPU b) Disk c) I/O resources d) Memory Modules **Ans: a**

1. **Dynamic Energy Consumption**: This refers to the energy consumed by a server or data center when it's actively performing tasks, such as processing requests, running applications, or handling data.

7	Statement 1: Sensor cloud integrates large-scale sensor networks and cloud computing infrastructures Statement 2: Sensor cloud collects and processes data from various sensor networks (a) Statement 1 is TRUE and Statement 2 is FALSE (b) Statement 2 is TRUE and Statement 1 is FALSE (c) Both statements are TRUE (d) Both statements are FALSE **Ans: c**

9	Which of the following building blocks are present in an IoT platform? (a) Things (b) Proxy (c) Gateway (d) Network and Cloud **Ans: a,c,d**

2. **Things**: In an IoT platform, "things" refer to the physical devices or objects that are connected to the internet and have the ability to collect and exchange data.
3. **Proxy**: A proxy in the context of IoT may act as an intermediary between devices and the cloud or other services.
4. **Gateway**: Gateways in IoT are devices that bridge the communication between IoT devices and the broader network or internet.
5. **Network and Cloud**: These are the broader infrastructure components that facilitate communication and data processing in an IoT system.

10	Which of the following challenges faced by the IoT systems are addressed by IoT cloud? (a) Scale (b) Speed (c) Safety (d) Privacy **Ans: a,b,c,d**

QUESTION 8:

Building blocks of IOT are

a. Things
b. Gateway
c. Network and Cloud
d. All above

Correct Answer: d

Detailed Solution: An IoT platform has basically three building blocks Things, Gateway, Network and Cloud.

a. Top layer
b. Middle layer
c. Bottom layer
d. None

Correct Answer: a

Detailed Solution: Top layer represents typical IoT applications executed across IoT and Clouds.

QUESTION 10:

The Virtual sensor configuration in which the geographical area is divided into regions and each region can have one or more physical sensors and sensor networks is?

a. One to many configuration
b. Many to one configuration
c. Many to many configuration
d. Derived configuration

Correct Answer: b

Detailed Solution: In many to one configuration the geographical area is divided into regions and each region can have one or more physical sensors and sensor networks.

QUESTION 2:

_____ reduce the overhead of resource management by using light-weight virtualization.

a) Containers
b) Virtual machines
c) Both a and b
d) Neither a nor b

Correct Answer: a

Detailed Solution: Containers reduce the overhead of resource management by using light-weight virtualization.

- Docker Engine is the core software that enables the creation, management, and running of Docker containers.
- Docker Compose is a tool for defining and running multi-container Docker applications.

QUESTION 5:

Docker engine is a tool for defining and running multi-container Docker applications.

a) True
b) False

Correct Answer: b

Detailed Solution: Docker compose is a tool for defining and running multi-container Docker applications. So, the correct option is (b).

QUESTION 6:

Which of the following procedure helps to reduce data center cooling cost in an energy efficient way?

a) Build servers that run at lower temperatures
b) Build servers that run at higher temperatures
c) Deploy fewer VMs
d) Deploy more VMs

Correct Answer: a

Detailed Solution: Building servers that run at lower temperatures can help to reduce data center cooling cost in an energy efficient way.

QUESTION 7:

Which of the following statements are True?

a) Virtual sensor is an emulation of a physical sensor that obtains its data from underlying physical sensors

b) Virtual sensors act as an image in the software of the corresponding physical sensors

c) Physical sensors contain metadata about the virtual sensors and the user currently holding that physical sensor

d) Physical sensors provide a customized view to users using distribution and location transparency

Correct Answer: a, b

Detailed Solution: Virtual sensor is an emulation of a physical sensor that obtains its data from underlying physical sensors. Virtual sensors act as an image in the software of the corresponding physical sensors.

Metadata is stored in the cloud infrastructure itself.

QUESTION 8:

--- get virtual access to host resources through a hypervisor.

a) Containers
b) Virtual machines
c) Both a and b
d) Images

Correct Answer: b

Detailed Solution: Virtual machines get virtual access to host resources through a hypervisor. So, the correct option is (b).

QUESTION 9:

In the context of Green Cloud Computing, the DC Server Energy Model is contributed by

a) CPU
b) Memory modules
c) Disks
d) None of these

Correct Answer: a, b, c

Detailed Solution: In the context of Green Cloud Computing, the DC Server Energy Model is contributed by CPU, memory modules and disks.

Data Center (DC) Server Energy Model:

- The Data Center Server Energy Model refers to a framework or methodology used to analyze and quantify the energy consumption patterns of servers within a data center environment.
- This model typically considers various components and factors that contribute to server energy consumption, such as CPU utilization, memory usage, disk operations, networking, cooling systems, and power distribution.

QUESTION 10:

For sensor resources that do not have direct connection to the cloud, sensor network proxy provides the connection.

a) True
b) False

Correct Answer: a

Detailed Solution: For sensor resources that do not have direct connection to the cloud, sensor network proxy provides the connection. So, the correct option is (a).