Quiz 1 (Intro)

1. Characteristics of CC - Ability to support heterogenous clients (thin and thick)
2. Characteristics of CC - customers can provision their own resources, serve multiple users concurrently, broad n/w connectivity
3. Characteristics of CC - Location independence, statistical multiplexing, pay as you go, automatic resource control
4. Cloud services resources - processing, storage, databases
5. PaaS user access - applications, libraries and runtimes
6. Example of PaaS - docker.com, LXC
7. Public > Private ? - scalability and no upfront cost
8. Broad network access - Grid and Cloud
9. Technologies enabling cloud comp - virtualisation, service oriented arch, self-managing comp sys
10. AWS EC2 states - pending, rebooting, terminate, stopped, running
11. Scalable without other AWS services - SQS
12. Reliable storage - S3
13. Enabling tech for CC - Virtualization, internet, datacenter
14. Essential to hybrid cloud - data portability across public and private
15. Private > public - security

Quiz 2 (Virtual Machines)

1. Which are the major forms of virtualization - memory, storage, machines, network
2. Which are the benefits of virtualization? - consolidating, sharing
3. Which have access to the user ISA? - App, Libs and runtimes
4. Which have access to the System ISA - Host OS
5. ABI - System Calls & User ISA
6. ISA VMs - Classic VM, Hosted VM & Emulator
7. ABI VM - Java VM
8. System VMs - Classic and hosted VM
9. System VMs - The VMM emulates the system ISA used by a VM. Most of the instructions used by an application run directly on hardware. The virtual ISA is identical to the physical ISA
10. Non-hosted VMs, what runs in privileged mode (kernel mode) - VMM
11. With hosted VMs, what runs in privileged mode (kernel mode) - VMM & Host OS
12. Which page tables are used by MMU for memory address translations? - Physical page table (for host OS). Shadow page table (for VMs)
13. Reasons for page fault - page not allocated, page swapped out by guest OS
14. With non-hosted VMs, what are involved when an application in a VM reads a file - Guest OS, VMM & Hard Disk
15. How are a VM's I/Os to a virtual disk virtualized - The I/O system calls trapped into VMM. VMM emulates the VM I/Os

Quiz 3 (Virtual Network)

1. What is the first step in the STP algorithm? - picking root port
2. What does tunnel mean? - The process of encapsulating an entire packet into another packet and transmit it over to its destination
3. Purpose of OVS-vswitchd module - A daemon that manages and controls Open vSwitch switches on the local machine
4. Which of the following protocols does not run on the data link(L2) layer - SSL
5. Which layers of network are required to provide support for the GRE tunnels? - L2,L3
6. What is the main difference between the control channel and data channel in L2TP? CC provides more reliable communication than DC
7. Where id does the VLAN protocol run with? VLAN ID
8. VxLAN runs on top of which protocol? - UDP
9. Examples of a passenger protocol - IP (TCP yes- VPN)
10. Two major components of OVS - ovsdb-server & ovs-vswitchd
11. Advantage of using VLAN - Allowing many logical networks to use the same network infrastructure.
12. Which domain is reduced by a network bridge? - collision domain
13. Tunnels and private networks are _____ network virtualization. - Applications of
14. Which is used to maintain/find the linux bridge forwarding table/records? - hash table
15. What is the main difference between Linux bridge and OVS? - Linux bridge is managed by local host, while OVS can be managed remotely.

Quiz 4 (OVS, NFV & SDN)

1. Purpose of network function virtualization (NFV) - NFV enables agile virtual networking services leveraging general purpose server
2. Which plane is responsible for the switching operation in a traditional router's internal architecture - data plane
3. Which layer is responsible for compiling the requirements of SDN requests? - Virtualization Layer

4. Why is it difficult to test a new routing algorithm in an already established traditional network system - Testing a new algorithm will affect the production system and require obtaining all the new routes to all neighbouring routers.
5. Which layer is OpenFlow - L2
6. The rule field of the flow table has which entries - Switch Port, Vlan ID, Ip address
7. What is the purpose of running the software part in the OpenFlow switch? - To establish a secure channel with the controller and communicate
8. Which modules run in the kernel space of the OVS? - Linux Kernel Drivers and Ovs Kernel Drivers
9. What is the purpose of OVS-vswitchd module? A daemon that manages and controls Open vSwitch switches on the local machine
10. Which communication protocol is proposed by NFV? - None
11. Which is the difference between SDN and NFV in terms of basic concept? - SDN separates control and data planes, while NFV relocates network functions from dedicated appliances.
12. How can one service provider (SP) leverage an IaaS provided by another SP? - There should be a common communication protocol that capable of connect both physical and virtual infrastructure.
13. What is the purpose of the link state database in a traditional router's control plane? - It stores the network topology.
14. Flow Chart
15. Goal of Group Table in the OpenFlow v1.3 onward - Group tables enable Openflow to process forwarding decisions on multiple links.

Quiz 5 (Storage Virtualization)

1. What aspects of storage does virtual storage typically virtualise - data location, data path
2. Which layers are in the path to storage - virtual file system, generic block layer, device driver, storage device
3. iSCSI is an example of - Block device level
4. What is true about iSCSI - present virtual block device, sends block IOs over IP, encapsulates SCSI commands in TCP packets, execute IOs on remote block device
5. Logical Volume Manager (LVM) is a device mapper framework that provides logical volume management for the Linux kernel.
6. What is true about LVM - decouples loc and size of vol from phys devices, can dynamically grow and shrink in size, migrate vol from one dev to another
7. Advantages of CoW snapshots - instant snapshots, snapshot versions, efficient space use (very slow writes)
8. NFS virtualisation layer - file system
9. Benefits of storage virtualisation - improve util of st res, provide strong isolation, customise st service acc to app needs
10. True about NFS - presents virtual file system
11. Ceph can support storage virtualisation - file system and block level
12. Ceph is - open source, unified storage system, reliable, scalable
13. Ceph component supporting object storage - RBD?
14. Which level of Ceph RADOS storage is managed by human administration? - Pools
15. Ceph components which support journaling - RBD

Quiz 6 (Nova, heat, Cinder)

1. Goal of Openstack - deliver public and private Iaas cloud by considering orchestration of computing networks and storage resources
2. OpenStack project giving computing services - NOVA (Daddy)
3. OpenStack project provides SDN capabilities - Neutron
4. D in OpenStack network diagram - OVS
5. Current openstack supports - KVM, QEMU, Docker, BareMetal
6. DHCP - Neutron
7. Openstack compute node communication with internet first module - OVS
8. Cinder - Block level
9. Openstack keystone tasks - Authorization, Authentication, Token generation
10. Openstack heat - create and monitor stacks, manage stack lifecycles and process heat templates
11. Openstack Cinder - backup volume, take snapshot, provide persistent FS storage resource
12. NOVA components - API, compute, client, etc in sheet
13. Visualisations of Neutron - n/w and router
14. What is openstack - cloud os/ open source
15. Most imp proj - NOVA; first proj, runs all compute nodes,