

SKIJ3113

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UUM
Universiti Utara Malaysia

**FINAL EXAMINATION
SECOND SEMESTER 2023/2024 SESSION**

COURSE CODE/NAME : SKIJ3113 / SCALING AND CONNECTING NETWORK

DATE : 7 AUGUST 2024 (WEDNESDAY)

TIME : 2.30 P.M. – 5.00 P.M. (2 ½ HOURS)

VENUE : BK4 COLGIS

INSTRUCTIONS :

1. This examination paper has **TWO (2) SECTIONS, A and B**, in **THIRTEEN (13)** printed pages excluding the cover page. **SECTION A** has **TWENTY-FOUR (24) STRUCTURED QUESTIONS** and **SECTION B** has **FIVE (5) PROBLEM SOLVING QUESTIONS**.
2. Answer **ALL** questions in the space provided.
3. You are **NOT ALLOWED** to remove the examination paper from the examination hall.

MATRIC NO.: _____

(in words)

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(in numbers)

IDENTIFICATION CARD NO.: _____

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LECTURER NAME: _____

GROUP: _____

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TABLE NO.: _____

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**DO NOT OPEN THIS EXAMINATION PAPER UNTIL
INSTRUCTED**

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SECTION A: STRUCTURED QUESTIONS (70 MARKS)**INSTRUCTION:** Answer **ALL** questions in the space provided.

1. Write the **OSPF packet name** that matches with the given description.

Description	Packet Name
Checks for database synchronization between routers.	
Discovers neighbours and builds adjacencies between them.	
Sends specifically requested link-state records.	

(3 marks)

2. Router A is participating in an OSPFv2 domain. If the dead interval has expired before router A receives a hello packet from an adjacent DROTHER OSPF router, explain the action taken by OSPF on Router A.

(2 marks)

3. Calculate the wildcard mask required to advertise the specified network address in OSPF for the following:

Network / Subnet / Host	Wildcard Mask
10.100.200.53/30	
192.168.100.0/24	
172.30.0.0/16	

(3 marks)

4. A network administrator has just changed the router ID on a router that is working in an OSPFv2 environment. What should the administrator do to reset the adjacencies and use the new router ID?

(1 mark)

5. **Scenario 1:** A user receives a phone call from a person who claims to represent IT services and then asks that user for confirmation of username and password for auditing purposes.

Scenario 2: A cleaner attempts to enter a computer lab but is denied entry by the receptionist because there is no scheduled cleaning for that day.

- a) Based on the above 2 scenarios, which security threat does these scenarios represent?

(1 mark)

- b) Name the terms used specifically for scenario 1 and scenario 2.

(2 marks)

Scenario 1:

Scenario 2:

6. Match the following **Security Terms** with the correct descriptions.

Assets	Vulnerability	Threat	Exploit	Mitigation
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Descriptions	Security Terms
The counter-measure that reduces the likelihood or severity of a potential threat or risk.	
A weakness in a system, or its design, that could be exploited by a threat.	
A potential danger to a company's assets, data, or network functionality.	
Anything of value to the organization. It includes people, equipment, resources, and data.	

(4 marks)

7. What is the permit or deny statements in an ACL called?

(1 mark)

8. A network administrator needs to configure a standard ACL so that only the workstation of the administrator with the IP address 192.168.15.23 can access the virtual terminal of the main router. Write **TWO (2)** configuration commands that can achieve the task?

i) Router1(config)#

ii) Router1(config)#

(4 marks)

9. Write the Cisco CLI command to:

a) verify the ACL statistics.

(1 mark)

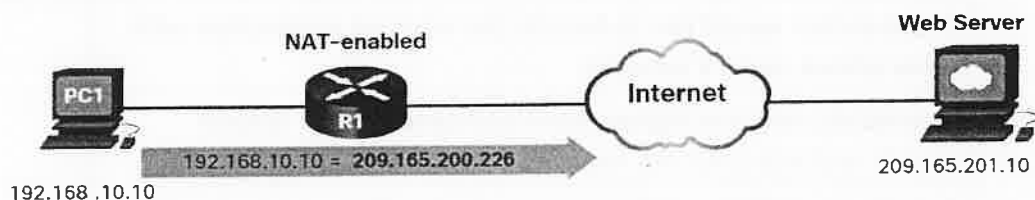
b) remove the ACL from the router.

(1 mark)

c) clear the ACL statistics

(1 mark)

10. Based on the topology below, identify the NAT address type for the following IP addresses.



IP Address	NAT Address Type
192.168.10.10	
209.165.200.226	
209.165.201.10	

(3 marks)

11. State whether the following IP address is a Public or Private IP address:

a) 11.11.11.11

(1 mark)

b) 172.32.14.200

(1 mark)

c) 192.168.72.100

(1 mark)

12. A company has been assigned the 203.0.113.0/27 block of IP addresses by the ISP. The company has over 6000 internal devices. What type of NAT would be most appropriate for the employee workstations of the company?

(2 marks)

13. Match the following WAN Solution with correct scenarios.

Cable	DSL	Frame relay	MetroE	T1	VSAT
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Scenarios	WAN Solution
A company would like guaranteed bandwidth using a point-to-point link that requires minimal expertise to install and maintain.	
A teleworker would like to bundle the Internet connection with other phone and TV services.	
A company requires higher download speeds than upload speeds and wants to use existing phone lines.	
A multi-site college wants to connect using Ethernet technology between the sites.	

(4 marks)

14. VPNs can be managed and deployed as either of two types, Enterprise VPNs and Service Provider VPNs.
- a) Name **TWO (2)** technologies provide enterprise-managed VPN solutions.
(2 marks)
- b) Name **TWO (2)** technologies for enterprise-managed remote access VPN.
(2 marks)
15. There are 3 types of traffic in a computer network namely voice, video and data. Identify traffic types based on the following characteristics:
- a) being able to tolerate a certain amount of latency, jitter, and loss without any noticeable effects.
(1 mark)
- b) tending to be unpredictable, inconsistent, and bursty.
(1 mark)
- c) consisting of traffic that gets a lower priority if it is not mission-critical.
(1 mark)
16. Scenario: A network administrator is deploying QoS with the ability to provide a special queue for voice traffic so that voice traffic is forwarded before network traffic in other queues.
Based on the above scenario, suggest which queuing method would be the best choice? Justify your answer.
(3 marks)

17. An administrator wants to replace the configuration file on a Cisco router by loading a new configuration file from a TFTP server.

a) What **TWO (2)** things does the administrator need to know before performing this task?

(2 marks)

b) Before replacing the configuration file, a network administrator wants to determine the size of the Cisco IOS image file on the networking device. What command should the administrator use on a Cisco router?

(1 mark)

18. A network manager wants to add a time to log messages so that there is record of when the message was generated.

a) What command should the administrator use on a Cisco router?

(2 marks)

b) List **THREE (3)** functions provided by the syslog service.

(3 marks)

19. As the network administrator you have been asked to implement EtherChannel on the corporate network. What does this configuration consist of?

(2 marks)

20. Match the borderless switched network guideline description to the following principle.

convergence	flexibility	hierarchical	modularity	Resiliency
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Descriptions	Principle
Facilitates understanding the role of each device at every tier, simplifies deployment, operation, management, and reduces fault domains at every tier.	
Allows seamless network expansion and integrated service enablement on an on-demand basis.	
Allows intelligent traffic load sharing by using all network resources.	
Satisfies user expectations for keeping the network always on.	

(4 marks)

21. A small company is considering moving many of its data center functions to the cloud. Explain **THREE (3)** advantages of this plan.

(3 marks)

22. What term is used to describe a set of instructions for execution by the following configuration management tool?

a) Puppet

(1 mark)

b) Saltstack

(1 mark)

23. Examine these 3 web addresses below. Identify whether it is a URI (Uniform Resource Identifier), URLs (Uniform Resource Locator) or URNs (Uniform Resource Name).

a) <https://www.cisco.com/c/en/us/solutions/design-zone.html#~all-guides>
(1 mark)

b) www.cisco.com/c/en/us/solutions/design-zone.html
(1 mark)

c) <https://www.cisco.com/c/en/us/solutions/design-zone.html>
(1 mark)

24. Identify the term for the following definition in relationship to configuration management tools:

a) Programmatically performing a task on a system such as configuring an interface or deploying a VLAN.
(1 mark)

b) The process of how all automated activities need to happen, such as the order they must be done and what must be completed before another task is begun.
(1 mark)

SECTION B: PROBLEM SOLVING QUESTIONS (30 MARKS)

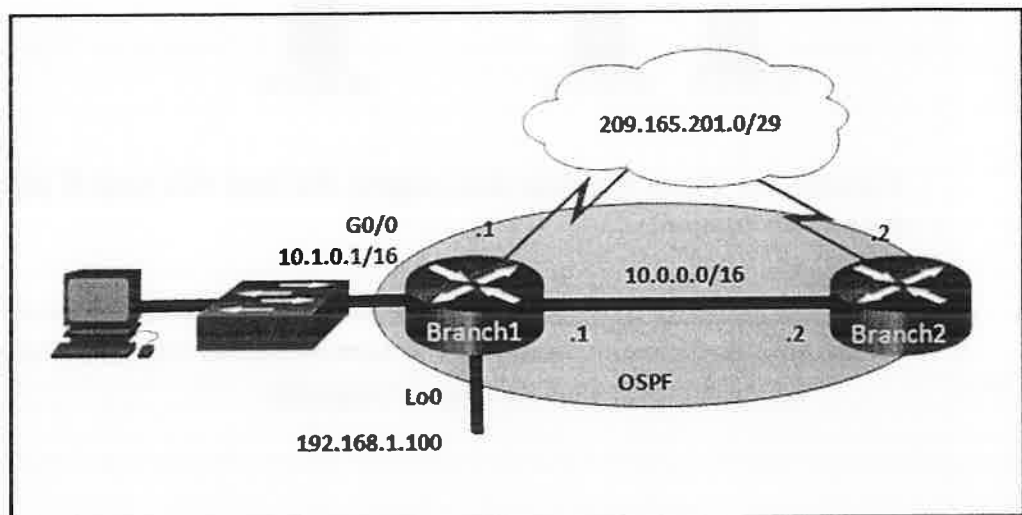
INSTRUCTION: Answer **ALL** questions in the space provided.

1. In OSPFv2, a Cisco router uses a three-tier method to derive its router ID.

a) What will an OSPF router prefer to use first as a router ID?

(1 mark)

b) If no router ID was manually configured, what would router Branch1 in the topology below use as its OSPF router ID?



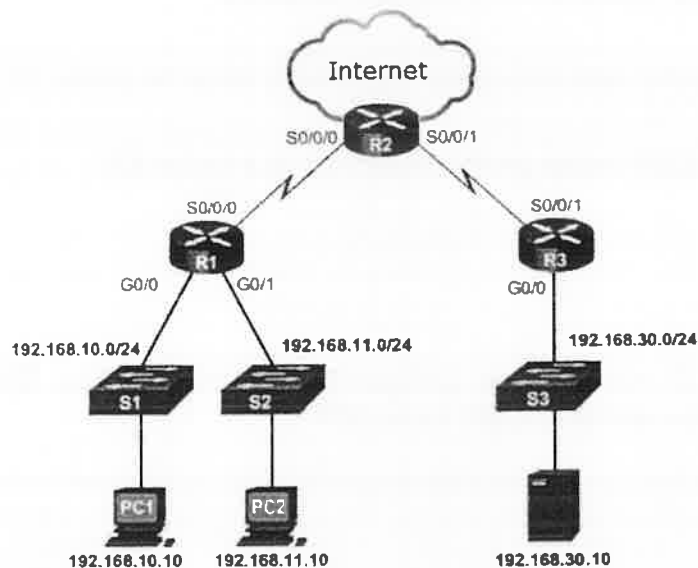
(1 mark)

c) Explicitly configure Router ID 2.2.2.2 on the Branch2 router. Use Process ID 10 in your configuration.

(3 marks)

Branch2(config)#

2. The following is the network topology of Syarikat Mesra Sintok Berhad.



Evaluate the above topology and suggest the best ACL type & placement to use in following situation:

- a) Network 192.168.30.0/24 contains all of the company servers. Policy dictates that traffic from the servers to both networks 192.168.10.0 and 192.168.11.0 be limited to replies for original requests.

(2 marks)

- b) The network administrator has an IP address of 192.168.11.10 and needs access to manage R1. What is the best ACL type and placement to use in this situation?

(2 marks)

- c) Many employees are wasting company time accessing social media on their work computers. The company wants to stop this access.

(2 marks)

3. A network administrator has just configured address translation and is verifying the configuration using **show ip nat statistics** command. The output of the command is as below:

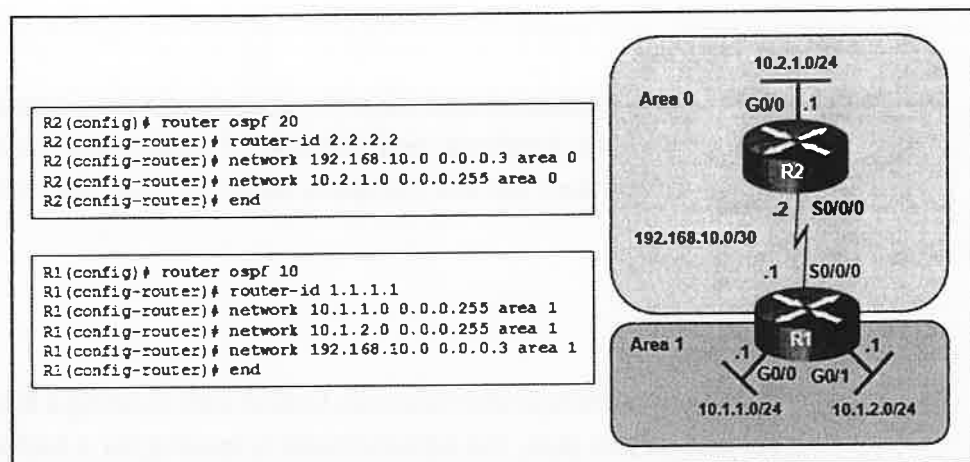
```
R1# show ip nat statistics
Total translations: 6 (2 static, 4 dynamic, 4 extended)
Outside Interfaces: Serial0/2/1
Inside Interfaces: Serial0/2/0 , FastEthernet0/0.10 , FastEthernet0/0.11 ,
FastEthernet0/0.12
Hits: 3 Misses: 4
Expired translations: 0
Dynamic mappings:
-- Inside Source
access-list 1 pool NAT refCount 4
pool NAT: netmask 255.255.255.248
start 209.165.200.228 end 209.165.200.230
type generic, total addresses 3 , allocated 1 (33%), misses 0
```

What **THREE (3)** things can the administrator verify?

(6 marks)

4. Evaluate the information given for each situation and state the cause of the problem that has been identified.

- a) Why are routers R1 and R2 below not able to establish an OSPF adjacency?



(3 marks)

- b) A user is unable to reach the website when typing `http://www.cisco.com` in a web browser, but can reach the same site by typing `http://72.163.4.161`. What is the issue?

(3 marks)

- c) R1 and R3 are connected to each other via the local serial 0/0/0 interface. Why are they not forming an adjacency?

(3 marks)

5. Evaluate the requirements stated below. Suggest a service or technology that can support the requirements.

- a) To avoid purchasing new hardware, a company wants to take advantage of idle system resources and consolidate the number of servers while allowing for multiple operating systems on a single hardware platform.

(1 mark)

- b) Following a multicontinent advertising campaign for a new product, a company finds its client database and volume of orders are overloading its on-site computer systems but the company does not have any room to expand.

(1 mark)

- c) A network administrator has been tasked with creating a disaster recovery plan. As part of this plan, the administrator is looking for a backup site for all of the data on the company servers.

(1 mark)

- d) Because of enormous growth in web traffic, a company has planned to purchase additional servers to help handle the web traffic.

(1 mark)

END OF QUESTIONS

