MACHAKOS UNIVERSITY

University Examinations for 2019/2020 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FOURTH YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE.)

SCO 401: NETWORK MANAGEMENT

DATE: 22/10/2020 **TIME: 8.30-10.30 AM**

INSTRUCTIONS

Answer question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

a) Discuss briefly any **Three** network management perspectives (6 marks)

b) Discuss briefly **Five** ISO network management functional areas (5 marks)

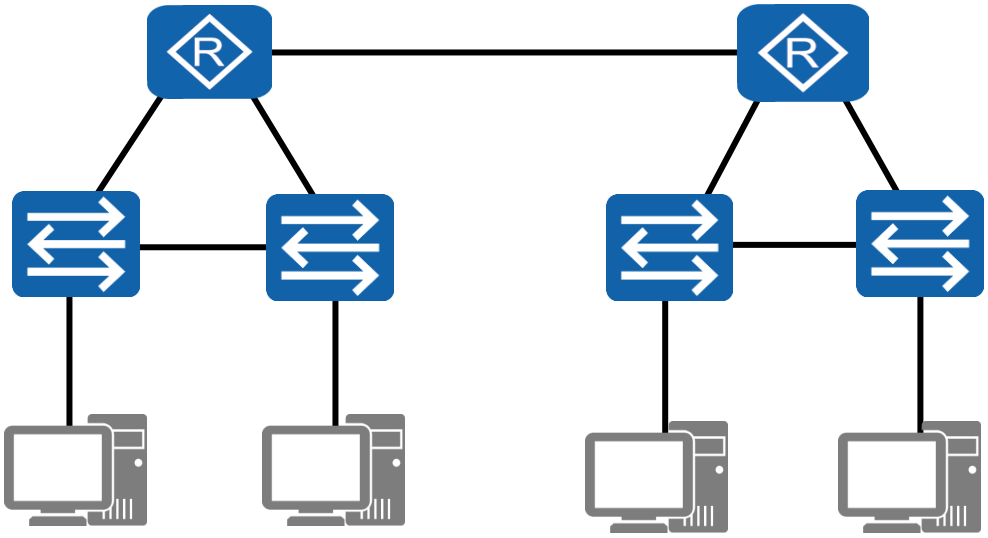
c) With the aid of diagrams explain the following redundancy issues when managing networks using switches.

i) Broadcast storms (2 marks)

ii) MAC instability (2 marks)

d) Explain briefly how the redundancy issues mentioned in c) above can be resolved. (2 marks)

e) Use the following diagram to answer the following question



i. Explain the difference between Collision Domains and Broadcast Domains. (2 marks)

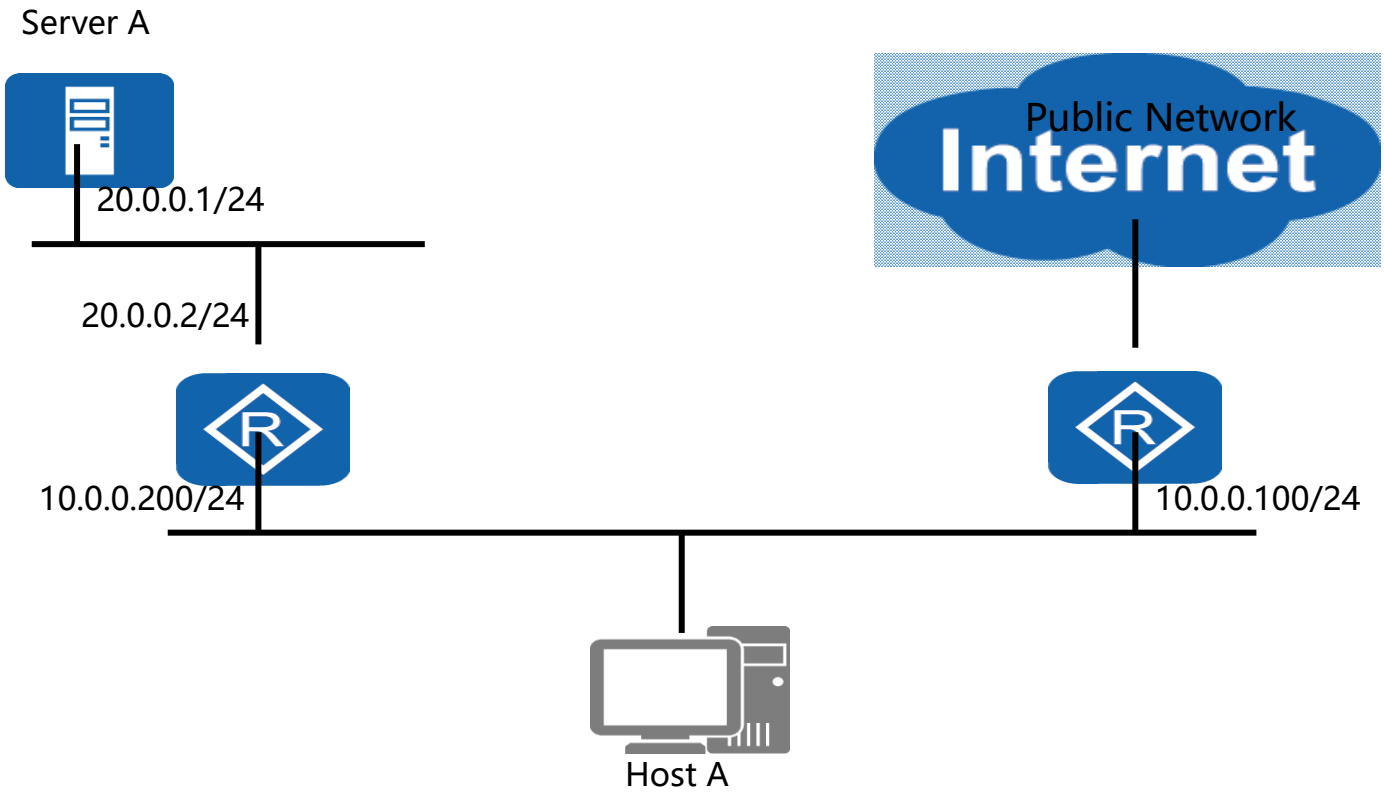
ii. Re-draw and label the diagram and explain how many Collision Domains and how many Broadcast Domains exist in the network diagram. (2 marks)

f) Given the IP address 192.42.53.0, create a list of IP address ranges for six subnets. (5 marks)

g) Describe **four** factors affecting network communication quality. (4 marks)

QUESTION TWO (20 MARKS)

a) Use the diagram below to answer the following questions.



IP: 10.0.0.1/24

Gateway: 10.0.0.100/24

i. With the aid of diagrams and examples, describe **three** functions of the diagnostic tool that works alongside IP to support routing. (6 marks)

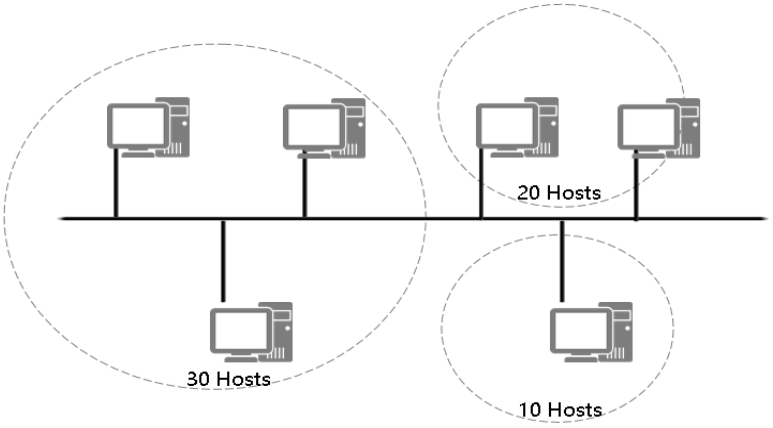
ii. Host A wants to send a packet to Server A. Describe how the tool mentioned in i) above will assist. (4 marks)

b) i Describe the two major management standards for managing networks. (4 marks)

ii Discuss briefly each of their functional areas. (6 marks)

QUESTION THREE (20 MARKS)

a) A networking department has been assigned the address 192.168.1.0/24. Use the diagram below to answer the following questions.



i) Determine to which class the address belongs to. (1 mark)

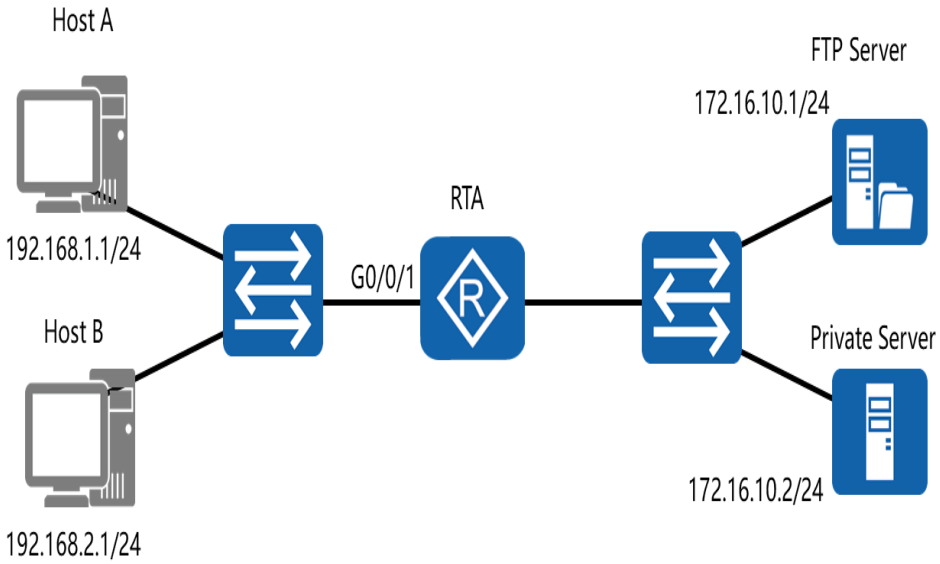
ii) Determine the network address and subnet mask for each network segment. (6 marks)

iii) Implementing VLSM, provide the first **three** host address ranges for the given number of hosts in each network segment. (9 marks)

b) Describe **four** network configuration, troubleshooting and debugging tools. (4 marks)

QUESTION FOUR (20 MARKS)

a) Use the diagram below to answer the following questions.



i. Explain the function of ACL in implementing security in a network. (2 marks)

ii. Explain two types of ACL that can be configured on the router. (4 marks)

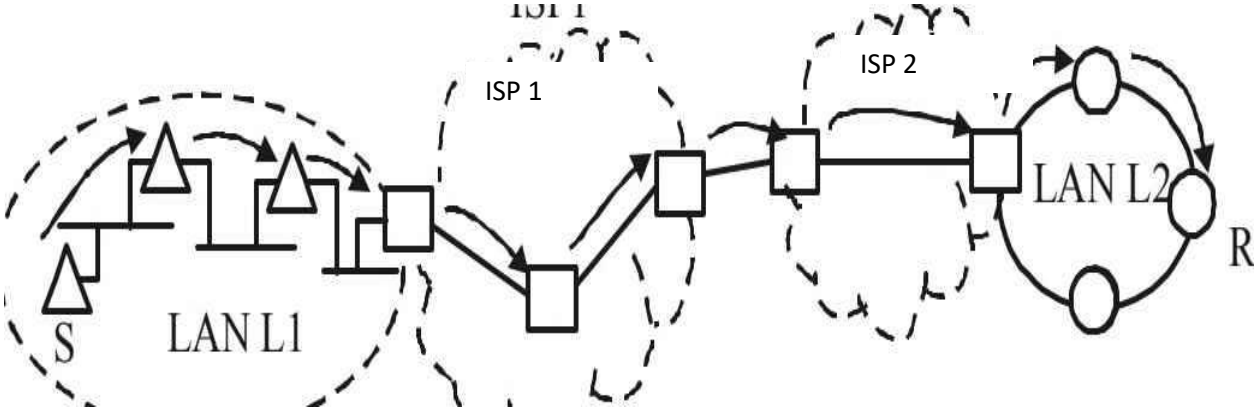
iii. Write ACL configurations for the above router to allow Host A to access, the FTP server and not access the private server and allow Host B to access the private server. (4 marks)

b) With the aid of a diagram, describe the functional network management dumbbell architecture (4 marks)

c) Describe the protocols and services associated with the above (4b) architecture (6 marks)

QUESTION FIVE (20 MARKS)

a) In the diagram shown below, L1 is an Ethernet LAN and L2 is a Token Ring LAN. An IP packet originates from sender S and traverses to R, as shown. The links within each ISP and across the two ISPs, are all point to point optical links. The initial value of the TTL field is 32.



i) Explain the acronym TTL and its function. (2 marks)

ii) Give the maximum possible value of the TTL field when R receives the datagram. (2 marks)

b) With the aid of a diagram, describe the SNMP network management architecture portraying the relationship between the data path between "the manager application process and the agent application process. (6 marks)

c) Discuss briefly how communication of management information among management entities is realized with the SNMP. (4 marks)

d) Describe **four** network scanning and performance analysis tools. (4 marks)

e) The routing table of a router is shown below.

Destination	Subnet mask	Interface
128.75.43.0	255.255.255.0	Eth 0
128.75.43.0	255.255.255.128	Eth 1
192.12.17.5	255.255.255.255	Eth 3
Default		Eth 2

Explain on which **two** interfaces will the router forward packets addressed to destination 128.75.43.16 and 192.12.17.10 respectively. (2 marks)