



**JARAMOGI OGINGA ODINGA UNIVERSITY OF SCIENCE  
AND TECHNOLOGY  
SCHOOL OF INFORMATICS AND INNOVATIVE SYSTEMS  
BSc Computer Security & Forensics  
KLC- SSP**

**IIT3227: Computer Systems and Networking Lab**

**INSTRUCTIONS:**

- i. This paper contains five (5) questions.**
- ii. Question ONE is Compulsory and any other TWO questions**
- iii. Answer the questions on the booklet provided**
- iv. Mobile Phones are not allowed in exams room**

**QUESTION ONE 30 MARKS (COMPULSORY)**

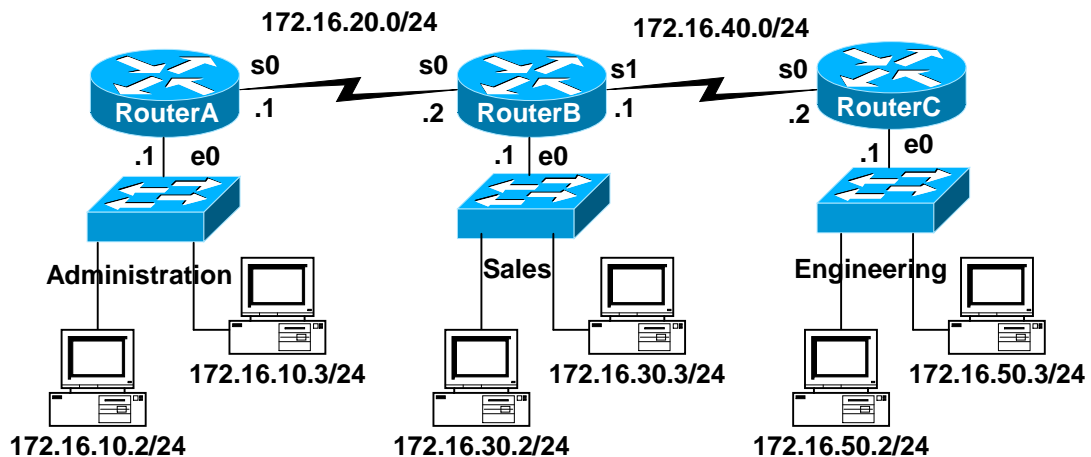
- a) A service provider has given you the Class C network range 209.50.1.0. Your company must break the network into as many subnets as possible as long as there are *at least* 50 clients per network. Do the subnetting for the given conditions and show your working. (9 Marks)
- b) Show the first and the last address for each network. (3 Marks)
- c) Name the four major types of firewalls; identify their levels of operation within the OSI layer model. (4 Marks)
- d) Briefly define the following terms: i) Bastion Host ii) Proxy Server ii) Honey Pot (6 Marks)
- e) Draw and explain a basic secure organizational network encompassing a router, firewall, proxy server, switch, VLANs (8 Marks)

### QUESTION TWO 20 MARKS

- Briefly explain how IPSEC and VPN can be implemented to connect an organization and its branches in different geographical locations. (9 Marks)
- Briefly explain what Access Control List (ACL) is/are. (3 Marks)
- Identify and differentiate the two types of ACL (5 Marks)
- Briefly explain the three network security goals [3 Marks]

### QUESTION THREE 20 MARKS

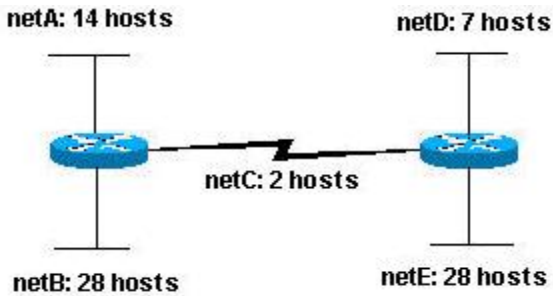
- Given the network shown below, configure Router A to permit only the Engineering workstation 172.16.50.2 to be able to access the web server in Administrative network with the IP address 172.16.10.2 and port address 80. All other traffic is denied [6 Marks]



- State five advantages 3 disadvantages of a wireless LAN [8 Marks]
- Explain the operational principle of CSMA/CD and CSMA/CA [6 Marks]

### QUESTION FOUR 20 MARKS

- Given Class C network of 204.15.5.0/24, subnet the network in order to create the network in the Figure shown with the host requirements. [8 Marks]



- b) Explain using labeled diagrams how a Honeypot works. [6 Marks]
- c) Wireless networks suffer a number of limitations; state at least three of its limitations and briefly explain each. [6 Marks]

**QUESTION FIVE 20 MARKS**

- a) Describe a router device and explain its working principle. [5 Marks]
- b) Explain how to supplement a firewall with a proxy server [5 Marks]
- c) Explain the goal of securing the network perimeter, indicate the requirements to achieve this goal [5 Marks]
- d) State and briefly explain five advantages of Proxy Server as a security device in a networked environment. [5 Marks]