

Undergraduate Programme
Department of Computer Science and Information Technology
Semester 1 Year 2016

FINAL COURSE EXAMINATION PAPER

ITC362: SYSTEM AND NETWORK ADMINISTRATION

Important Instructions to Students:

1. Read the questions, instructions carefully and answer the questions.
2. You are allowed an **extra 10 minutes reading time** (during this time, you are not allowed to write with pen) and **180 minutes (3 Hours) to complete this paper**.
3. Silent, non-programmable calculators are allowed, but not supplied.
4. Write all your answers in the answer booklet provided. If you need extra sheets, please ask from the supervisor. Write your name, course code and student identification number in the answer booklet and in the attendance sheet.
5. **This Final Course Examination Paper is worth 100 marks contributes 50% of the total course assessments.**
6. This paper contains one (1) section A. All questions are compulsory to answer.
7. Write all your answers legibly. The marker has the right to award zero for answers that are not legible.
8. This is a **Closed Book Examination**. The University views plagiarism, cheating and dishonest practice as serious offences and if found, offenders are penalized.

Examination Paper Content (Format):

<u>Section</u>	<u>Question</u>	<u>Content</u>	<u>Marks</u>	<u>Suggested Time</u>
A	1-10	Short Answer Questions	100	180 minutes
		TOTAL	100	180 Minutes

QUESTION 1: SYSTEM ADMINISTRATOR AND NETWORKS

[10 Marks]

- A. List and briefly explain three reasons for *computer networking*. [3 Marks]
- B. What do you understand by *network administration* and what are their duties [2 Marks]
- C. List five (5) good *system administration practices* and explain, why those are good practices? [5 Marks]

QUESTION 2: SYSTEMS MANAGEMENT

[5 Marks]

- A. Explain the purpose of "*Ctrl+Alt+Del*" key combination. [1 Mark]
- B. What is *user authentication* and what are the three (3) *entities* that can authenticate a user. [2 Marks]
- C. List and explain the two (2) *authentication protocols* supported by windows server. [2 Marks]

QUESTION 3: FILE SYSTEMS

[10 Marks]

- A. What is a *file system*? [1 Mark]
- B. What are the differences between *NTFS* and *FAT* file systems? What are some of the features available on NTFS volumes but are not available on FAT volumes? [3 Marks]
- C. Explain the following shared folder permission rules.
I. Multiple Permissions
II. Deny overrides Allow
III. Copy or Moving Shared Folders [3 Marks]
- D. Compare and contrast between *Administrative shares* and *Hidden shares*. [2 Marks]
- E. In addition to *NTFS* permissions, why do we need *EFS*? [1 Mark]

QUESTION 4: TCP/IP

[20 Marks]

- A. Draw the diagram of the “7 Layer OSI reference model” and explain end-to-end connectivity. [4 Marks]
- B. Consider the IP Address 10.20.30.21 with a subnet mask of 255.255.255.0. Find out the following using the above information:
- I. Network ID:
 - II. Broadcast Address:
 - III. Host Range:
 - IV. Default Gateway:
 - V. No. of Hosts:
- [5 Marks]
- C. What is the primary purpose of the routing process? [1 Mark]
- D. A newly hired technician is testing the connectivity of all hosts by issuing a *ping* command. The technician notices that a default gateway is not configured on all the hosts, but all hosts have connectivity between hosts, a fact which seems to confuse the technician. How would you explain the connectivity to the technician? [1 Mark]
- E. A company is planning to subnet its network for a maximum of 27 hosts. Which subnet mask would provide the needed hosts and leave the fewest unused addresses in each subnet? [1 Mark]
- F. Company XYZ uses a network address of 192.168.4.0. It uses the mask of 255.255.255.224 to create subnets. What is the maximum number of usable hosts in each subnet? [1 Marks]
- G. Refer to *Fig. 1* below and determine which devices are recommended to have the IP addresses manually configured?

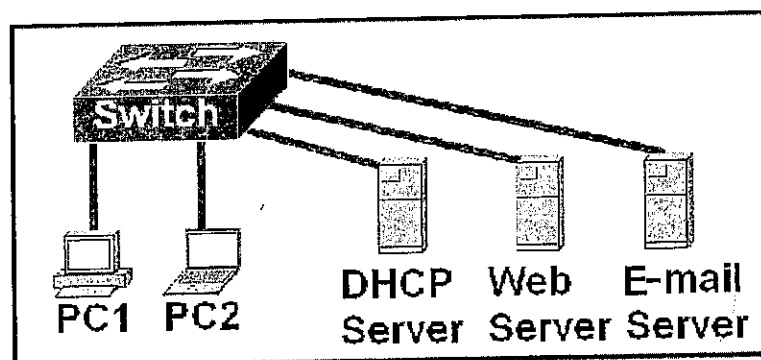


Fig. 1: (<http://www.ccna5.net/>)

[1 Marks]

c:/> **ipconfig /all**

< output omitted >

Physical Address : 00-50-8D-F1-EA-8B

Dhcp Enabled : Yes

Autoconfiguration Enabled : Yes

IP Address : 192.168.1.100

Subnet Mask : 255.255.255.0

Default Gateway : 192.168.1.1

DHCP Server : 192.168.1.1

DNS Servers : 68.87.64.196

68.87.66.196

Lease Obtained : Tuesday, June 14, 2005 5:28:57 PM

Lease Expires : Wednesday, June 15, 2005 5:28:57 PM

Fig. 2: (<http://www.ccna5.net/>)

- I. The LAN segment is subnetted to allow 254 subnets.
- II. The DNS server for this host is on the same network as the host.
- III. The host automatically obtained the IP addresses 192.168.1.100.
- IV. The host received the IP address from the router on the local LAN segment.
- V. The host is assigned an address of 00-50-8D-F1-EA-8D by the administrator

[2 Marks]

- I. Refer to the *Fig. 3*. A network technician is trying to determine the correct IP address configuration for Host A. What is a valid IP address, Subnet Mask and Default Gateway for Host A?

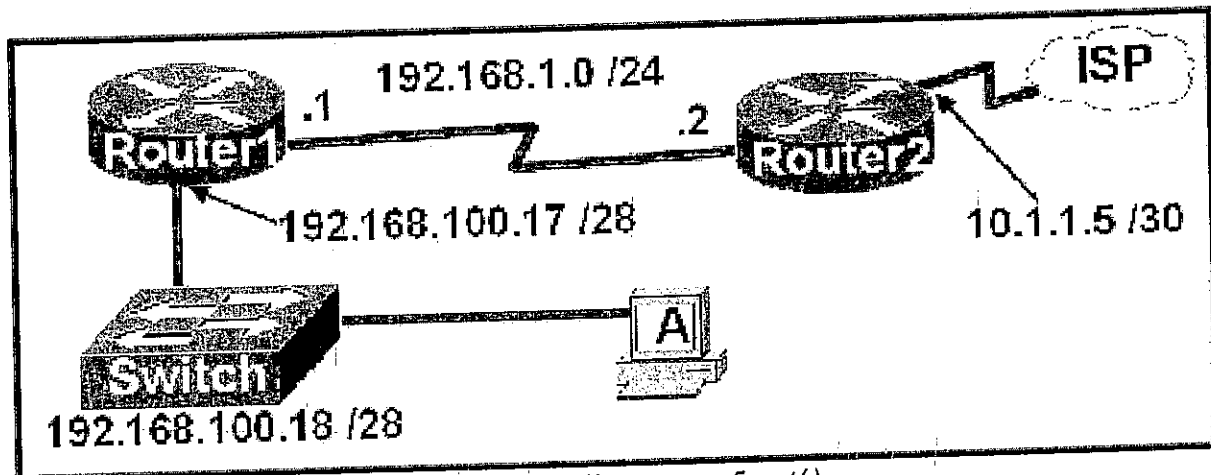


Fig. 3: (<http://www.ccna5.net/>)

[1 Mark]

- J. A technician is testing connectivity between the devices using the ping command. Pings between Host B and Host A were successful. The technician could not ping the R3 address 172.16.3.2 from Host A. The technician issued ipconfig from Host A and saw the information displayed in *Fig. 4*. What is the most likely problem?

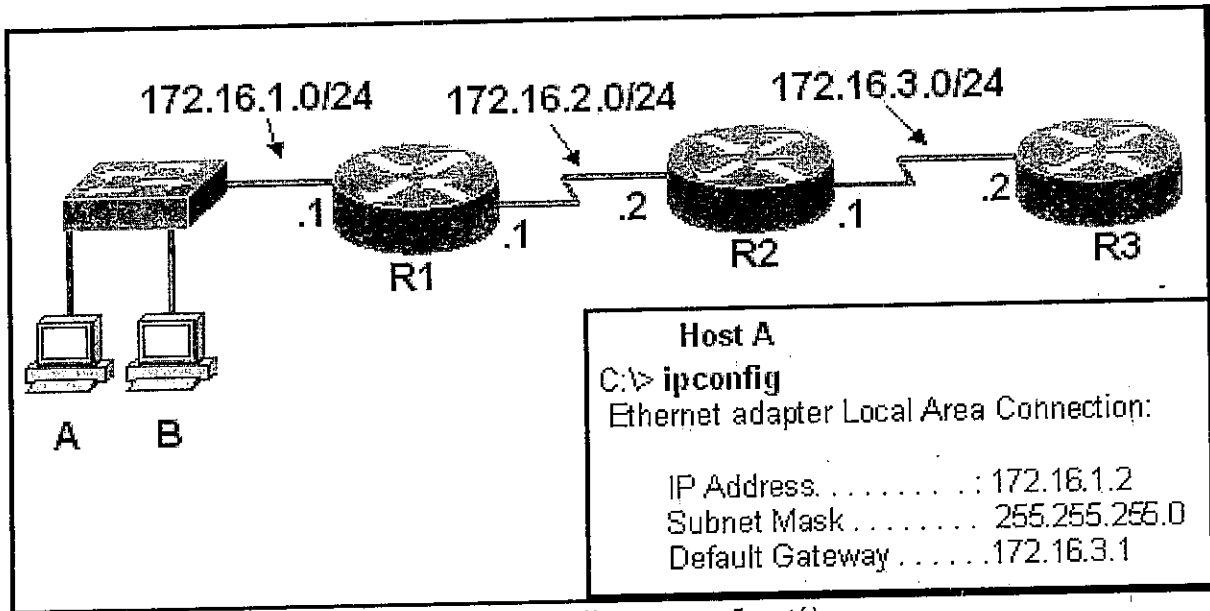


Fig. 4: (<http://www.ccna5.net/>)

[1 Mark]

- K. Which device would add security to a network by not forwarding broadcasts?

[1 Mark]

- L. What is the correct subnet mask for /25 network?

[1 Mark]

QUESTION 5: BACK-UP AND RECOVERY

[13 Marks]

- A. What is the advantage of performing *back-ups* from a back-up device installed on the server?

[1 Mark]

- B. List and explain the three back-up options in Windows Server Backup tool.

[3 Marks]

- C. What advantage does *RAID 5* have over *RAID 1*? Over *RAID 0*? Disadvantages?

[3 Marks]

- D. List and explain the three Considerations for using the Windows Server Backup tool?

[2 Marks]

- E. Why is backup an important part of system administration? Where do you recommend storing backup tapes when planning for disaster recovery and providing your justification for the recommendation?

[3 Marks]

- F. What are two (2) Windows Server 2008 Storage Options?

[1 Mark]

- A. What is DHCP and why should network administrators use *DHCP*? [2 marks]
- B. Define *loopback address*, *private address* and *APIPA*. What are the three ranges of addresses [2 marks]
- C. Explain with a diagram, how a DHCP client receives IP address from a DHCP server? [2 marks]
- D. What is Domain Name System (*DNS*)? Explain DNS structure, hierarchy and the name resolution process for internet. [2 marks]
- E. What do you understand by *DHCP scope*, *reservations* and *exclusion*? [2 marks]
- F. Explain with diagrams, DHCP IP Address renewal process. Explain both successful and unsuccessful renewal process. [4 marks]

QUESTION 7: ROUTING AND NAT

[6 Marks]

- A. What do you understand by *Network Address Translation (NAT)*? Explain with diagram the basic operation of NAT. List good features of NAT. [3 marks]
- B. List and briefly explain the three (3) concerns of using NAT. [3 marks]

QUESTION 8: INTRODUCTION TO LINUX

[8 Marks]

- A. What do you understand by *Linux distributions*? List some of the distribution names and which one in your opinion is better? [2 Marks]
- B. Explain the purpose of the following linux commands?
 I. ls
 II. cd
 III. pwd
 IV. mkdir [2 Marks]
- C. Provide an unbiased comparison between Windows and Linux Operating Systems. Discuss at least four (4) factors of comparison. [4 Marks]

QUESTION 9: LINUX DHCP, DNS, APACHE AND VSFTPD

[4 Marks]

- A. What is the purpose of the *nmtui* utility? What are the three (3) configuration options it provides?
[2 Marks]
- B. Explain the purpose of the *vi* editor in Linux. Explain how to go to input mode of the *vi editor* and how do you save changes and exit.
[2 Marks]

QUESTION 10: CLOUD COMPUTING

[10 Marks]

- A. What is Cloud Computing, define *Cloud Computing* and defend your definition with your own views.
[2 Marks]
- B. List and Explain four (4) main aspects of Cloud Computing? Explain with a diagram.
[4 Marks]
- C. Define Cloud Computing Gaps and explain 2 major Gaps.
[3 Marks]
- D. Explain virtualization with an example.
[1 Mark]

THE END

