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TECHNICAL UNIVERSITY OF KENYA

FACULTY OF APPLIED SCIENCES AND TECHNOLOGY

SCHOOL OF COMPUTING & INFORMATION TECHNOLOGY

END OF SEMESTER OCTOBER 2017 EXAMINATION SERIES

THIRD SEMESTER EXAMINATIONS 2016/2017

THIRD YEAR EXAMINATIONS FOR THE DEGREE OF

BACHELOR OF TECHNOLOGY IN COMMUNICATION AND COMPUTER NETWORKS

**ECCI 3209: LAN DESIGN, INSTALLATION AND CONFIGURATION**

TIME: 2 Hours  **OCTOBER 2017**

**Instructions to candidates:**

This paper consists of FIVE Questions.

Answer Question ONE [30 Marks] and any other TWO Questions [20 Marks Each].

Write your college number on the answer sheet.

This paper consists of 3 printed pages

**Candidates should check the question paper to ascertain that allthe pages are printed as indicated and that no questions are missing.**

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**QUESTION ONE (30 MARKS) COMPULSORY**

1. List and explain the functions of the seven layers of the OSI Model (7marks)
2. Outline four components of a local area network (8marks)
3. Distinguish between IEEE 802.11 AND IEEE 802.3 standards (10marks)
4. Explain the use of the following cables:- straight-through cable, rollover cable, and crossover cables ( 5 marks )

**QUESTION TWO (20 MARKS)**

1. Identify the distinction between a “service” and “protocol” (4 marks)
2. State 3 error-detecting codes (3 marks)
3. List 7 steps followed for a complete communication process (7marks)
4. Give the meanings and use of the following i) SMTP ii) DNS iii) TELNET (6marks)

**QUESTION THREE (20 MARKS)**

1. With the use of a diagram, describe the implementation peer-to-peer networks (5marks)
2. Outline how the transport layer ensures “reliable delivery” (3 marks)
3. Explain the use of “netstat” and “nslookup” (4 marks)
4. Using a diagram, illustrate the parts of a coaxial cable detailing the functions of each part (8 marks)

**QUESTION FOUR (20 MARKS)**

1. State 3 basic characteristics of IP Version 4 (3 marks)
2. Compare and contrast use of fiber optics and copper wire (6 marks)
3. Differentiate between a “switch” and “router” (4 marks)
4. The Internet is roughly doubling in size every 18 months. Although no one really knows for sure, one estimate put the number of hosts on it at 600 million in 2009. Use these data to compute the expected number of Internet hosts in the year 2018. Do you believe this? Explain why or why not. (7 marks)

**QUESTION FIVE (20 MARKS)**

1. State 3 functions of the Data Link layer (3 marks)
2. List 4 error-correcting codes (4 marks)
3. Explain the main difference between TCP and UDP? (2 marks)
4. List the 2 subnetworks of the network 192.168.10.0 whose subnet mask is 255.255.255.128 (4 marks)
5. Given a class C address 192.168.15.0 and suppose that four departments, A, B, C, and D, request 15, 20, 25, and 26 addresses, create an addressing scheme using VLSM (variable length subnet masking) that meets the requirements shown in the diagram, conserving the maximum number of addresses for future growth. (7 marks)