# KABARAK UNIVERSITY

## UNIVERSITY EXAMINATIONS

### 2009/20010 ACADEMIC YEAR

### FOR THE DEGREE OF BACHELOR OF EDUCATION SCIENCE

**COURSE CODE:** COMP 312

**COURSE TITLE:** COMPUTER NETWORKS

**STREAM:** SESSION VI

**DAY:** FRIDAY

**TIME:** 2.00 – 4.00 P.M.

**DATE:** 13/08/2010

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**INSTRUCTIONS:**

1. **This question paper has FIVE questions**
2. **Answer question ONE and any other TWO questions**

**PLEASE TURNOVER**

**QUESTION ONE (30 MARKS) COMPULSORY**

(a) Explain the meaning of following terms
   i. Manchester encoding system
   ii. CSMA/CA
   iii. Eavesdropping (6mks)

(b) Distinguish between the following giving an example of each
   i. An ordinary operating system and a network operating system
   ii. Ethernet and token ring technologies (6mks)

(c) Compare and contrast switches and hubs (5mks)

(d) Study and fill the table below for the categories of UTP cables given (5mks)

| **CAT** | **Capacity(mbps)** | **Usage** |
|---|---|---|
| CAT2 | 4 | Slow token ring |
| CAT3 | | |
| CAT4 | | |
| CAT 5 | | |
| CAT 5E | | |
| CAT6 | | |

(e) A transmitting station A that uses ASCII coding system sends out the message *Cab* to station B that also uses ASCII coding system.
   i. Determine the block checksum at station A. (5mks)
   ii. The block checksum obtained in B is 01000000. Is there an error in transmitting the massage? Explain (3mks)

**QUESTION TWO (20 MARKS) ELECTIVE**

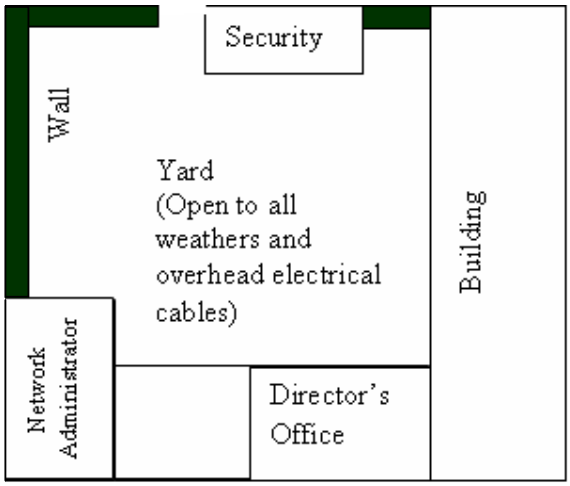
(a) The IP address 01111111.00010101.10101101.00010101 was assigned to a network node by a student.
   i. Convert each part of the IP address to a decimal number and write down the full address in dotted decimal value (5mks)
   ii. Identify the network class, network id, host id and correct sub netting (4mks)
   iii. Explain why it is not advisable to assign this IP address to a network node (3mks)

(b) For each of these four network issues: RJ11, DHCP, NRZ-I and MAC,
   i. Write their names in full (2mks)
   ii. Explain their functions in networking (4mks)
   iii. State the OSI reference model layer they operate at (2mks)

**QUESTION THREE (20 MARKS) ELECTIVE**

The director of an institution wishes to set up computer network between the director's office, security, and network administrator's office and eventually to the internet. The location of the three offices is as shown in the plan below. The distance between network administrator's

and security is 600m, and the distance between network administrator's and director's office is 100m.




(a) Explain why the best medium choice for connecting network administrator's office to the security office is fibre optics. (10mks)

(b) Apart from cabling, the network devices needed to set up the network include hubs, switches, routers, gateways and NICs. In context of the above set up, explain the functions and appropriate location for these devices (10mks)

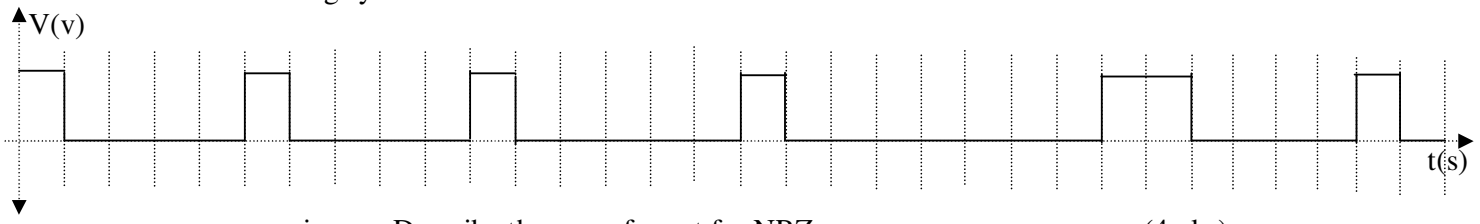
**QUESTION FOUR (20 MARKS) ELECTIVE**

(a) Explain the meaning of the following terms

i. Signal

ii. Clock synchronization (4mks)

(b) The graph below shows a NRZ signal of a certain word coded in ASCII character coding system.




i. Describe the wave format for NRZ (4mks)

ii. Explain one merit and two limitations of NRZ over NRZ-I (3mks)

iii. Determine the binary bit stream for the signal in the graph above (6mks)

iv. Hence identify the characters represented in the signal. (3mks)

**QUESTION FIVE (20 MARKS) ELECTIVE**

(a) What is an effective security policy? (2mks)

(b) A network security system may not be all that effective without an effective security policy. State and explain any six security policy goals (6mks)

(c) Explain the meaning of the following terms as far as network security is concerned
   i. Proxy server
   ii. Snooping (4mks)

(d) One of the threats to network security is risk associated with transmission and hardware. Explain any eight risks associated with people that concerns network security (8mks)