

NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY

FACULTY OF INDUSTRIAL TECHNOLOGY BACHELOR OF ENGINEERING (HONS) DEGREE

Final examination May 2011 TEE
5224

High Speed Networks

Duration of Examination 3 Hours

Instructions to Candidates:

1. Answer any **five** questions only.
2. All questions carry equal marks.
3. Show all your steps clearly in any calculation.
4. Start the answers for each question on a fresh page.

Question 1

- (a) Give the Five principles that were applied to arrive at the seven OSI layers. (5 marks)
- (b) What is the purpose of the OSI reference model (11 marks)
- (c) Give FOUR functions of a Data Link Layer in an OSI reference model. (4 marks)

Question 2

- (a) State the interfaces that are found in Data terminal equipment (DTE)and Data terminating circuits equipment (DCE) (8 marks)
- (b) Describe the functions of the eight registers in the 8250 Universal Asynchronous Receiver and Transmitter (UART) (12 marks)

Question 3

- (a) Explain the IP protocol version 4. Show the classes of IP Address formats. Give the four types of IP routing methods . (10 marks)
- (b) Give reasons to justify the use of IP version 6. State the six main features of the IP version 6. (10 marks)

Question 4

- (a) State the function of IEEE 802.3 (Ethernet) CSMA/CD. Explain its implementation. (8 marks)
- (b) Describe a high speed LAN with FDDI and Fast Ethernet in terms of speed, distance, types of cables, bandwidth and advantages. (8 marks)
- (c) Show the set up of the Asynchronous Transfer Mode packets. State the reason for choice and length of the packets. (4 marks)

Question 6

- (a) In the formulation of the Queueing theory state at least SEVEN factors that are considered. (7 marks)
- (b) Give three basic statements that are used to define the Poisson arrival process. (6 marks)
- (c) Define Asymmetrical Digital Subscriber Line. State the main advantage it offers at global scale (7 marks)

Question 7

Discuss High Level Data Link Control (HDLC) Protocol in terms of type of protocol, service designed for, classes of procedures in the network, frame structure, and control fields defined. (20 marks)

Question 8

- (a) Describe a typical X25 vertical call set up and clearing. (10 marks)
- (b) Show a block diagram of an ISDN system with PBX for use in large businesses. (10 marks)