GENERAL SIR JOHN KOTELAWALA DEFENCE UNIVERSITY
Faculty of Engineering
Department of Electrical, Electronic and Telecommunication Engineering

BSc Engineering Degree

Semester 5 Examination – April 2021
Intake 36 (ET/EE)

COMMUNICATION -NETWORKS
(ET3102)

Time allowed: 2 hours 22 April 2021

JM

ADDITIONAL MATERIAL PROVIDED

Nil

INSTRUCTIONS TO CANDIDATES

This paper contains 5 questions on 6 pages.

Answer ALL questions.

This is a closed book examination.

This examination accounts for 70% of the module assessment. The total maximum mark attainable from this examination is 100.

If you have any doubt as to the interpretation of the wordings of a question, make your own decision, but clearly state it on the script.

Assume any reasonable values for any data neither given in nor provided with the question paper, clearly make such assumptions made in the script.

All examinations are conducted under the rules and regulations of the KDU.

Question 01

a. List down the ISO/OSI seven layers. [7 marks]

b. Name functions of each layer listed in part a. including at least two protocols. [7 marks]

c. Define TCP/IP layers and compare them with ISO/OSI layers. [4 marks]

d. Explain the relationship of layers and addresses in TCP/IP [6 marks]

Question 02

a. Explain the following header format information in the IP datagram [8 marks]

(1) Type of Service
(2) Flag
(3) Fragmentation Offset
(4) Header Checksum

b. An IPv4 datagram has arrived with the following information in the header (in hexadecimal);

45 00 00 54 00 03 58 50 20 06 00 00 7C 4E 03 02 B4 OE OF 02

Using the IP header given in the figure 2.1 answer the followings; [7 marks]

(1) Header length
(2) Payload length
(3) Flags
(4) Identification No
(5) Time to Live
(6) Source IP Address
(7) Destination IP Address

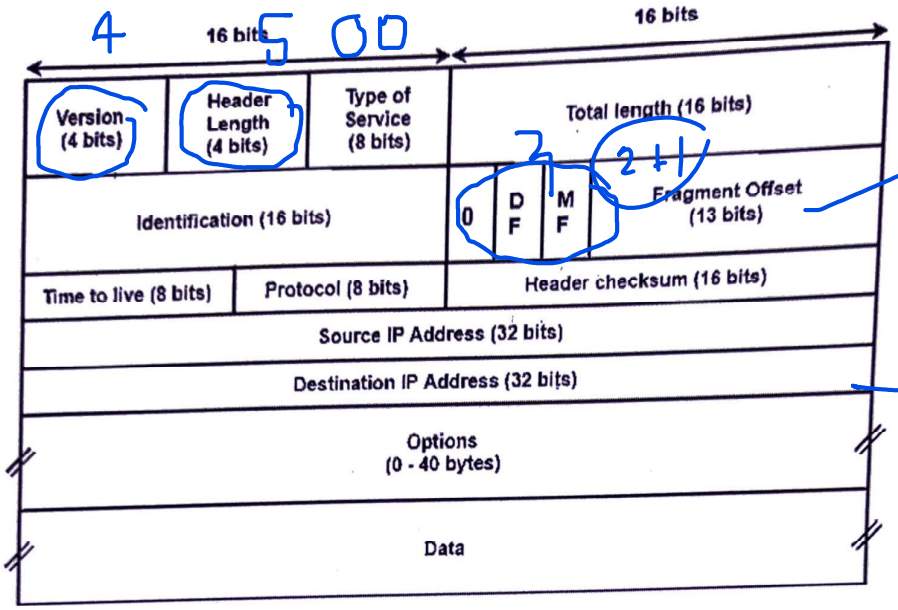

Figure 2.1 : IP Header

c. Compare and contrast the classful addressing and classless addressing in IPv4. [5 marks]

Question 03

a. Discuss the advantages of IPv6 over IPv4. [4 marks]

b. Briefly explain migration techniques used for IPv4 and IPv6 coexistence. [6 marks]

c. List down the type of information included in IPv6 header [4 marks]

d. Convert the following IPv6 addresses to the most compressed format. [6 marks]

(1) 2001:0db8:cab0:0234:0034:0004:0000:0020

(2) 2041:0000:140f:0000:0000:0000:875b:131b

(3) 2001:0001:0002:0003:0004:0005:0006:0007

Question 04

a. Briefly explain and compare static routing and dynamic routing. [6 marks]

b. Categorize the types of routing protocols. [6 marks]

c. The following table shows the relationship among sequence number, number of bytes in a segment and the acknowledgement number sent by the receiver. Write down the table in your answer booklet and fill the acknowledgement and sequence number columns by considering the TCP connection oriented data transmission. [9 marks]

Client				Server			
Segment	No. of byte(s)	Seq No	Ack No	Segment	No. of byte(s)	Seq No	Ack No
SYN	1	3000	-				
				SYN, ACK	1	1000	3001
ACK	1	3001	1001				
Data	100	3001	-				
				Data	1500	1001	3102
Data	1000	3102	2502				
Data	2000	3102	2502				
				Data	3000	2502	6104
Data	500	6104	5503				
				Data	1000	5503	6605
FIN	1	6605	6504				
				ACK	1	6504	6606
				FIN	1	6505	6606
ACK	1	6606	6506				

Ouestion 05

a. Briefly explain five terms out of followings; [15 marks]

(1) Ethernet
(2) Token Bus
(3) CSMA/CD
(4) CSMA/CA
(5) Bandwidth and Throughput
(6) Virtual Private Network (VPN)
(7) Integrated Services Digital Network (ISDN)
(8) Asynchronous Transfer Mode (ATM)

---End of the Question Paper---