



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

BSc Engineering Degree
Semester 5 Examination – May/ June 2020
(Intake 35 – ET/EE)

ET3102– COMMUNICATION NETWORKS

Time allowed: 2 hours

3rd July 2020

ADDITIONAL MATERIAL PROVIDED

Nil

INSTRUCTIONS TO CANDIDATES

- This paper contains **five** questions and answer **all** the questions on answer booklets.
- This paper contains 7 pages with the cover page.
- This is a closed book examination.
- This examination accounts for 70% of the module assessment. A total maximum mark obtainable is 100. The marks assigned for each questions and parts thereof are indicated in square brackets.
- If you have any doubt as to the interpretation of the wordings of the question, make your own decision, but clearly state it on the script.
- Assume any reasonable values for any data not given in or 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

[30 marks]

- List down the ISO/OSI seven layers. [3 marks]
- Give two responsibilities for each of the layers listed in part a). [14 marks]
- Using Figure 1 discuss how the peer-to-peer communication happens in ISO/OSI reference model. [8 marks]

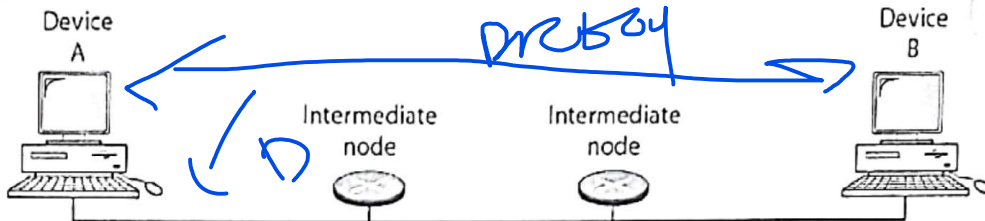


Figure 1

- Define at which OSI layer following devices are worked. [3 marks]
 - Router → 3rd
 - Switch → 2nd
 - Hub → 1st
- Explain the difference between TCP and UDP protocols? [2 marks]

QUESTION 02

[19 marks]

- The following is a dump of a TCP header in hexadecimal format. (16)

SP 05320017 00000001 00000000 500207FF 00000000

Using the TCP header given in Figure 2.1 identify the following parameters.

- Source port number. 1330
- Destination port number. 23
- Sequence number. 1
- Acknowledgment number. 0
- Length of the header. 20
- Type of the segment.
- Window size.

A - 10
B - 11
C - 12
D - 13
E - 14
F - 15

[7 marks]

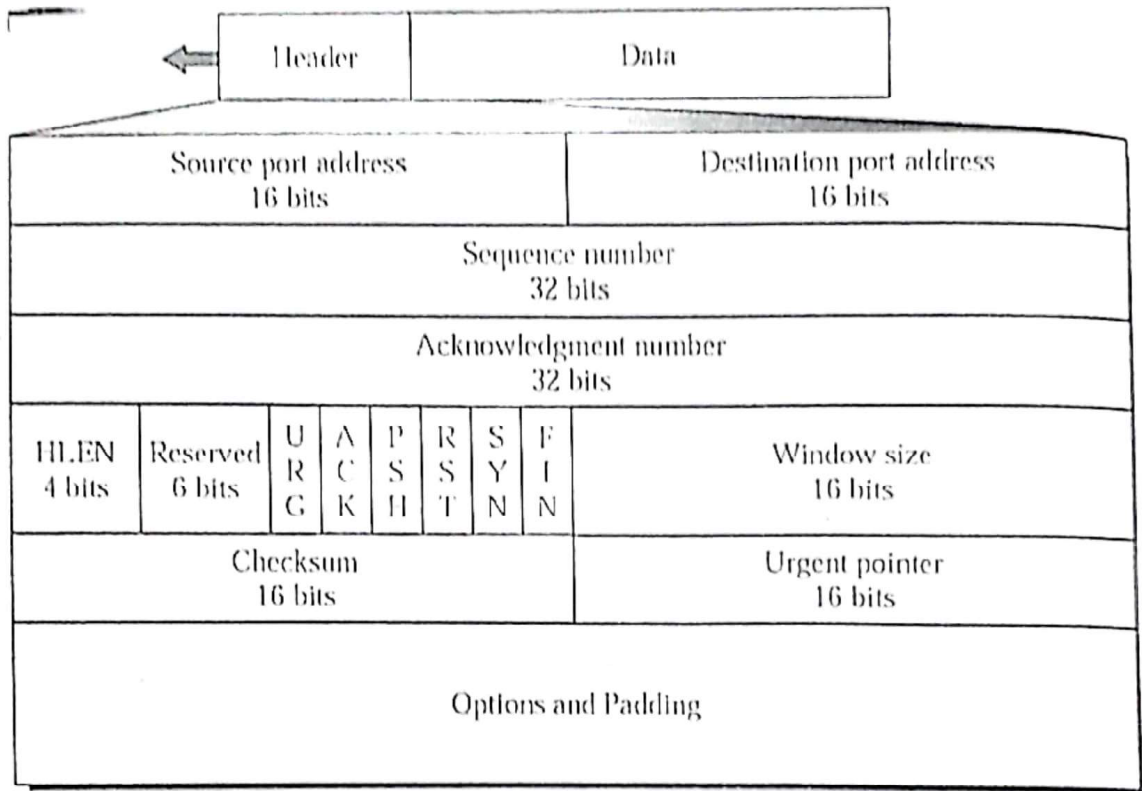


Figure 2.1

- b) Assume at the time of establishing a TCP connection, data transfer and connection termination between a client and a server. Draw the Figure 2.2, 2.3 and 2.4 in your answer booklet and fill the **sequence number (SN)** and the **acknowledgement number (AN)** of each connection. Assume the size of each Syn, Syn+Ack and Ack segment as 1 byte. [12 marks]

1 byte
S = 1000

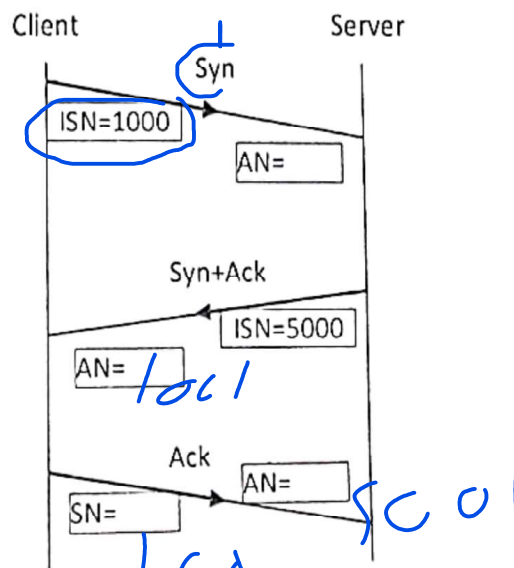


Figure 2.2

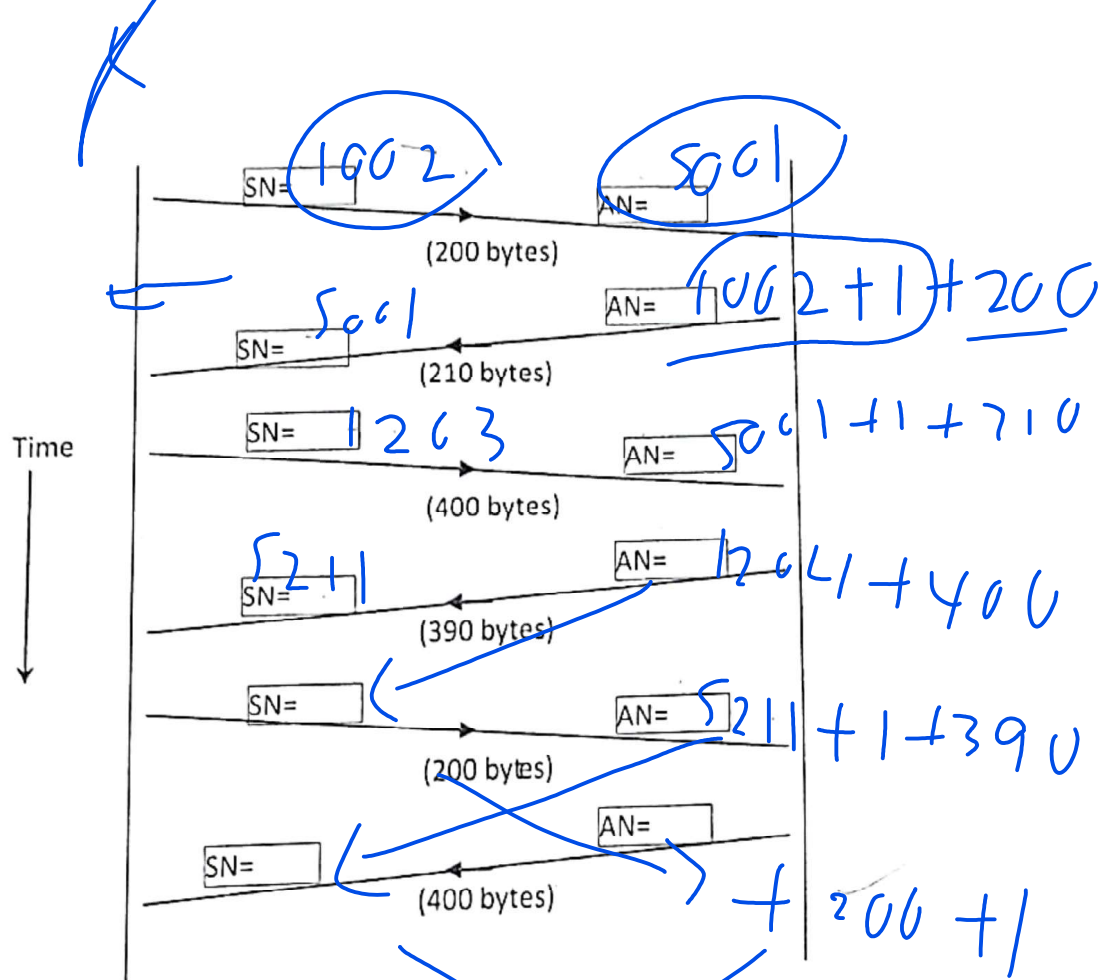


Figure 2.3

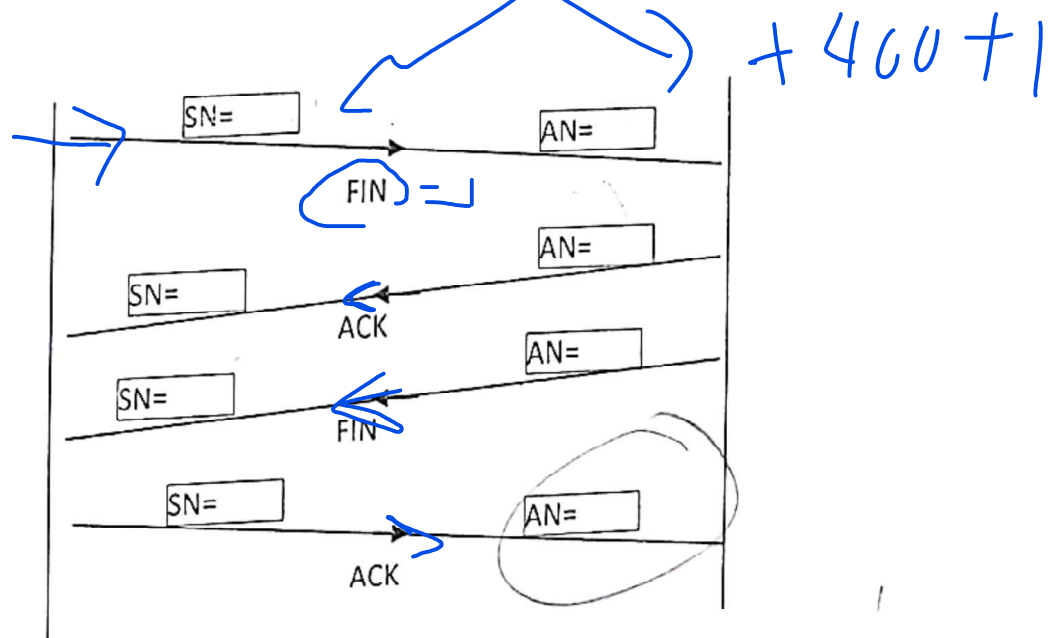


Figure 2.4

QUESTION 03

[22 marks]

- a) List down three features of IPV6? Explain each of them. [9 marks]
b) "IPV6 is better than IPV4". Discuss your answer. [3 marks]
c) Please do specify whether the following IP addresses are correct. Give the reasons to your answers. [10 marks]
- 2001 : db8: 0333 : 4444 : 5555 : 6666 : 7777 : 8888
 - ::
 - 2001: db8: :
 - :: 1234 : 5678
 - 2001: db8: 0001: 0000: 0000: 0ab9: C0A8: 0102

QUESTION 04

[14 marks]

- a) Explain the following routing methods.

[9 marks]

- Static routing
- Special case: default route
- Dynamic routing

- b) The Figure 4.1 shows a network with two computers and a router. The figure 4.2 gives the routing table of the router R1 (where the R1 router configured with the name of HQ_Router).

Determine whether the Host A communicate with Host B? Justify your answer.

communicate
[5 marks]

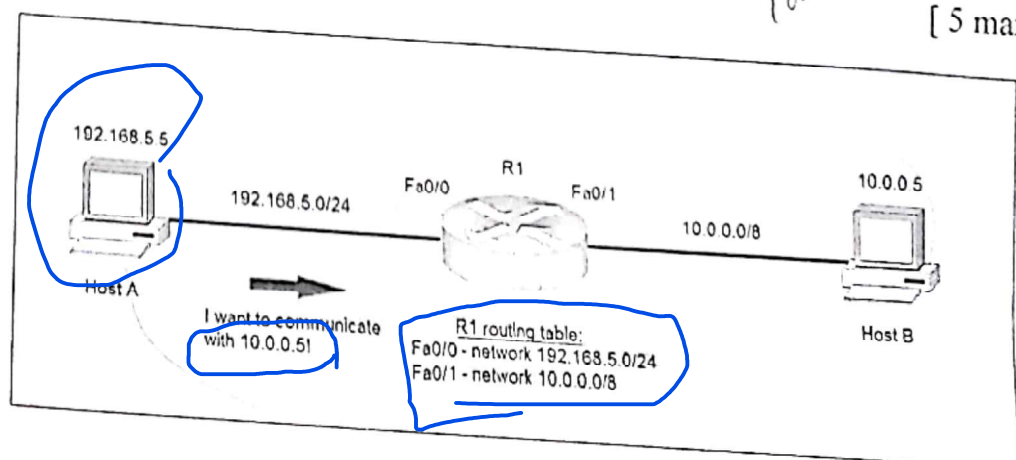


Figure 4.1


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B0 Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, R - RBP
       1 - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

C    0.0.0.0/8 is directly connected, FastEthernet0/0
C    192.168.5.0/24 is directly connected, FastEthernet0/0

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(- drawn in J-
Figure 4.2

QUESTION-05

[15 marks]

Explain only five technologies from the followings.

- ✓ a) Ethernet
- b) Token Ring
- c) WiMAX
- d) Virtual Private Networks (VPN)
- e) ADSL (Asymmetric Digital Subscriber Line)
- ✓ f) PSTN (Public Switch Telephone Network)
- g) WiFi
- h) Near Field Communication (NFC)
- ✓ i) ISDN (Integrated Services Digital Network)
- j) CSMA/CD
- k) CSMA/CA

(13)

*****End of Question Paper*****