Fakulti Komputeran

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

UNIVERSITI PENYELIDIKAN

TEST 1 SEMESTER II 2013/2014

COURSE CODE	:	**SCSR 1213**
COURSE NAME	:	**NETWORK COMMUNICATIONS**
YEAR/PROGRAM	:	**1 SCSB/SCSJ/SCSR/SCSV**
TIME	:	**5:15 – 6:30 PM**
DATE	:	**9 MARCH 2014 (SUNDAY)**
VENUE	:	**BK 1 – 5 (N28)**

ANSWER ALL QUESTIONS IN THIS BOOKLET.

NAME	
I/C NO.	
YEAR/PROGRAM	
SECTION	
LECTURER NAME	

THIS PAPER CONSIST OF 9 PAGES EXCLUDING THIS PAGE.

SECTION A

MULTIPLE CHOICE QUESTIONS (15 MARKS)

(INSTRUCTION: Please answer all 15 questions in the answer sheet on page 4.)

1. Two fundamental approaches to moving data through a network of links and switches. They are:

    i) Packet switching   iii) Router switching

    ii) Cell switching   iv) Circuit switching

    A) i & ii   C) ii & iii

    B) iii & iv   D) i & iv

2. Host are also known as:

    i) End systems   iii) Clients

    ii) Mobile Devices   iv) Servers

    A) i, ii & iii   C) ii, iii & iv

    B) i, iii & iv   D) All of the above

3. Internet standards are developed by?

    A) Internet Engineering Task Force (IETF)

    B) Internet Assigned Numbers Authority (IANA)

    C) Advanced Research Project Agency (ARPA)

    D) Internet Service Provider (ISP)

4. Internet Service Provider for Digital Subscriber Line users is?

    A) The Internet company

    B) The local telephone company

    C) The enterprise network company

    D) The Core network company

5. Which of the following media has the fastest propagation speed:

   A) Radio channel   C) Coaxial cable

   B) Twisted pair cable   D) Optical fiber cable

6. Choose the **correct** order of the Internet Protocol stack layers:

   A) Application – Transport – Network – Data Link – Physical

   B) Application – Transport – Physical – Network – Data Link

   C) Physical– Transport – Network – Data Link – Application

   D) Application – Network– Transport – Data Link – Physical

7. The tool used to measure internet delay for every hop along end to end path towards destination is?

   A) ping   C) nslookup

   B) ipconfig   D) traceroute

8. Listed below are the motivations behind protocol layering, **EXCEPT**:

   A) Simplification by modularizing the systems

   B) Ease of implementation by software only.

   C) Ease of layer management

   D) Any service changed does not affect the whole system

9. Listed are Denial of Service attacks, **EXCEPT**:

   A) Vulnerable attack   C) Identity Disguise

   B) Bandwidth flooding   D) Connection flooding

10. One way to masquerade as another user and inject packets into the internet with a false source address is known as:

   A) IP stealer   C) IP sniffer

   B) IP replicator   D) IP spoofing

11. The following are characteristics of **servers** in a client-server architecture, **EXCEPT**:

    A) Always-on host

    B) Initiates communications with clients

    C) Permanent IP address

    D) Data centers for scaling

12. Which of the following is an application layer service:

    A) Remote login   C) Mail service

    B) File transfer   D) All of the above

13. Which protocol is used for sending email on the internet?

    A) SMTP   C) SNMP

    B) SMPP   D) FTP

14. Listed below are the purpose of cookies, **EXCEPT**:

    A) Authorization   C) Recommendation

    B) Internet Telephony   D) Shopping Cart

15. A HTML file with **five** referenced objects accessed within a **single** TCP connection uses _____ HTTP connection.

    A) Both Persistent & Non-persistent   C) Persistent

    B) Non-persistent   D) Paralleled persistent

ANSWER SHEET FOR SECTION A

NAME :			MARKS
MATRIC NO.:		**SECTION :**	

Example: =A=   ●   =C=   =D=

1)	=A=	=B=	=C=	=D=
2)	=A=	=B=	=C=	=D=
3)	=A=	=B=	=C=	=D=
4)	=A=	=B=	=C=	=D=
5)	=A=	=B=	=C=	=D=
6)	=A=	=B=	=C=	=D=
7)	=A=	=B=	=C=	=D=
8)	=A=	=B=	=C=	=D=
9)	=A=	=B=	=C=	=D=
10)	=A=	=B=	=C=	=D=
11)	=A=	=B=	=C=	=D=
12)	=A=	=B=	=C=	=D=
13)	=A=	=B=	=C=	=D=
14)	=A=	=B=	=C=	=D=
15)	=A=	=B=	=C=	=D=

SECTION B

STRUCTURED QUESTIONS (35 MARKS)

(INSTRUCTION: Please answer all questions in this booklet.)

<u>**QUESTION 1**</u> (13 Marks)

(a) Aminah wants to download a 70-MBytes Naruto movie file from iTunes server. The transmission rate is 15Mbps. Assume that the propagation speed is $3*10^8$ meters/sec, and the distance between Aminah's computer and iTunes server is 1000km. Assume the entire movie file is sent as one packet. Show your workings.

    i.   Calculate the transmission delay. [3 marks]

    ii.   Calculate the propagation delay. [2 marks]

    iii.   Ignoring the processing and queuing delay, what will be the end-to-end delay? [1 mark]

iv. How many bits of the movie file have been transmitted by the iTunes server when the first bit arrives at Aminah's computer?

[2 marks]

(b) Refer to Figure 1. Suppose Host A wants to send a large file to Host B. The path from Host A to Host B has 3-links, of rate R_1= 10 Mbps, R_2= 10 Gbps, and R_3= 1 Gbps.
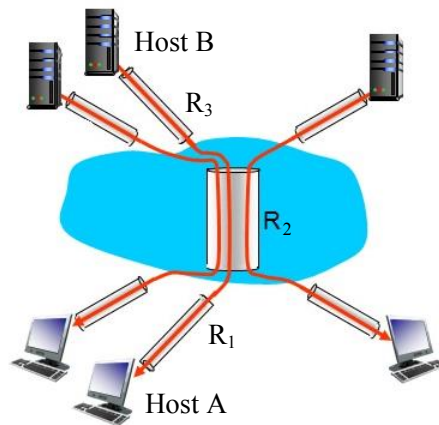
Figure 1

i. Assuming no other traffic in the network, what is the throughput for the file transfer? Justify your answer.

[2 marks]

[3 marks]

ii. Suppose the file is 3 MBytes. How long will it take to transfer the file to Host B?

QUESTION 2 (22 Marks)

(a) Study the figures below and answer the following questions:

HTTP request message:

```
GET /images/2013/safae.JPG HTTP/1.1
Host: utmonline.utm.my
User-Agent: Mozilla/5.0 (Windows NT 5.1; rv:19.0)
Gecko/20100101 Firefox/19.0
Accept: image/png,image/*;q=0.8,*/*;q=0.5
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Referer: http://utmonline.utm.my/
Cookie:
__utma=223080415.435223643.1321413706.1357014565.135748
4172.13; __utmz=223080415.1357484172.13.3.utmcsr=yahoo|
utmccn=(organic)|utmcmd=organic|utmctr=utmonline%
20utm;
__utma=121530700.1451015479.1357720161.1357720161.13577
20161.1; __utmz=121530700.1357720161.1.1.utmcsr=
(direct)|utmccn=(direct)|utmcmd=(none); __atuvc=5%7C2
Connection: keep-alive
If-Modified-Since: Tue, 05 Mar 2013 03:26:24 GMT
If-None-Match: "2f060-3100-9bd3800"
```

Figure 2a

HTTP response message:

```
HTTP/1.1 304 Not Modified
Date: Tue, 05 Mar 2013 12:12:36 GMT
Server: Apache
Connection: Keep-Alive
Keep-Alive: timeout=5, max=97
ETag: "2f060-3100-9bd3800"
```

Figure 2b

    i.   What is language preferred by the client?   [1 mark]

    ii.   What is the URL and filename requested by client?   [2 marks]

    iii.   What type of connection does this packet used to transfer the request [1 mark]
            and receive data?

iv. What protocol and port number does server used to reply the client's [2 marks] request?

v. Was the client able to find the requested document in cache and when [2 marks] was the cached copy last updated?

(b) Figure 3 shows an institutional network connection setup. Answer the following questions based on the assumption below:

- average object size: 512MB
- average request rate from browsers to origin servers: 10 requests/sec
- access link rate: 32Mbps
- LAN rate: 1Gbps

Figure 3
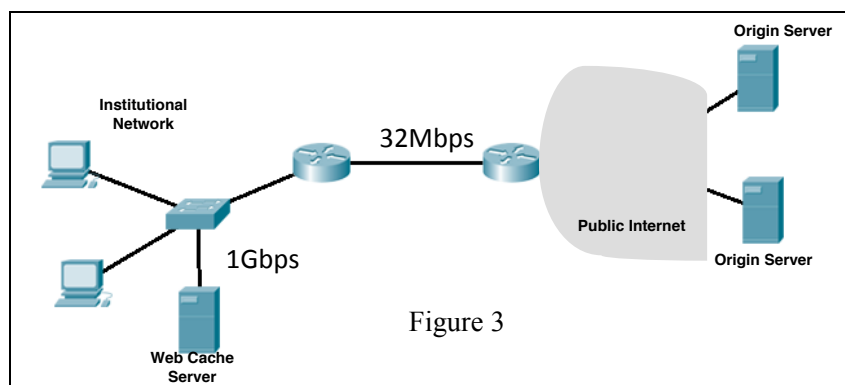
i. Calculate access link utilization. [2 marks]

    ii.   Assume the access link rate is increased to 128Mbps. Calculate the   [2 marks]
access link utilization.

    iii.   Assume the link capacity is unchanged (32Mbps) and a web server cache   [3 marks]
is used which has a hit rate of 60%. Calculate the data rate and utilization
for the access link.

    iv.   Compare answer ii and iii. Which is the better solution? Explain your   [3 marks]
reason.

(c) Referring to Figure 4, fill in the blanks with the correct data unit at each layer.

i. _____

ii. _____

iii. _____

message   M

H_t M

H_n H_t M

H_l H_n H_t M

source

application

transport

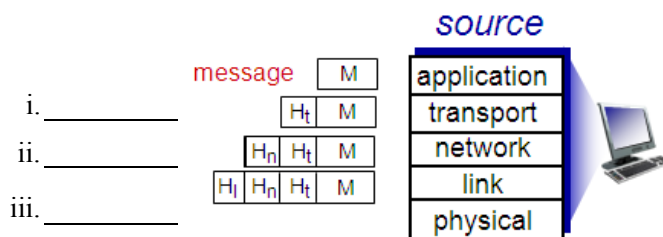network

link

physical

Figure 4   [3 marks]

(d) The process of appending header at each layer is called _____.   [1 mark]

------- End of Questions -------