UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Sekolah Pendidikan Profesional dan Pendidikan Berterusan (UTMSPACE)

FINAL EXAMINATION / *PEPERIKSAAN AKHIR*
SEMESTER 2 – SESSION 2016 / 2017
PROGRAM KERJASAMA

COURSE CODE *KOD KURSUS*	:	DDWC 1673 /DDPC 2673
COURSE NAME *NAMA KURSUS*	:	DATA COMMUNICATION AND NETWORKING / *KOMUNIKASI DATA DAN RANGKAIAN*
YEAR / PROGRAMME *TAHUN / PROGRAM*	:	1 / DDWC /2 / DDPC
DURATION *TEMPOH*	:	2 HOURS 30 MINUTES / *2 JAM 30 MINIT*
DATE *TARIKH*	:	MAC / APRIL 2017

INSTRUCTION/*ARAHAN* :

Answer **ALL** questions in the provided answer booklet.
*Jawab **SEMUA** soalan dalam buku jawapan yang disediakan .*

(You are required to write your name and your lecturer's name on your answer script)
(Pelajar dikehendaki tuliskan nama dan nama pensyarah pada skrip jawapan)

NAME / *NAMA*	:	.....
I.C NO. / *NO. K/PENGENALAN*	:	.....
YEAR / COURSE *TAHUN / KURSUS*	:	.....
COLLEGE NAME *NAMA KOLEJ*	:	.....
LECTURER'S NAME *NAMA PENSYARAH*	:	.....

This examination paper consists of **6** pages including the cover
*Kertas soalan ini mengandungi **6** muka surat termasuk kulit hadapan*

Instruction: Write your answers in the answer booklet provided.

Arahan: Tuliskan jawapan di buku jawapan yang disediakan.

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1. List two(2)types of routing algorithms. **[2M]**
   Nyatakan dua(2) jenis algoritma penghalaan.

2. State the meaning of Ethernet. Give three(3) type of Ethernet. **[6M]**
   Nyatakan maksud Ethernet. Berikan tiga(3) jenis Ethernet.

3. Briefly describe one main function of each seven layers in the OSI network model. **[7M]**
   Terangkan secara ringkas satu fungsi utama lapisan bagi setiap lapisan dalam model rangkaian OSI.

4. Explain the differences among analog data, analog transmission, digital data and digital transmission. **[6M]**
   Terangkan perbezaan antara data analog, penghantaran analog, data digital dan penghantaran digital.

5. Describe the function of media access control. **[4M]**
   Terangkan fungsi kawalan capaian media.

6. Briefly explain the function of static routing and dynamic routing. When would you use static routing and dynamic routing? **[5M]**
   Terangkan secara ringkas fungsi penghala statik dan penghala dinamik. Bilakah penghala statik dan dinamik boleh digunakan?

7. Consider a binary sequence 100111001 flow through a channel. For each method below, draw the wave of the digital to digital conversion. **[9M]**
   Pertimbangkan jujukan binari 100111001 melalui satu saluran. Bagi setiap kaedah di bawah, lukis gelombang pertukaran digital ke digital.

   a) RZ
   b) NRZ_I
   c) Differential Manchester

8. Answer the following question based on error detection and correction.
Jawab soalan di bawah berdasarkan kaedah pengesan dan pembetulan ralat.

a) Assume the message 1100111 1010101 0101010 0011001 is transmitted. Show how the sender and receiver would detect an error using VRC and LRC error correction scheme. **[4m]**
Diandaikan mesej 1100111 1010101 0101010 0011001 dihantar. Tunjukkan bagaimana penghantar dan penerima mengenalpasti ralat dengan menggunakan skima pembetulan ralat VRC dan LRC.

b) Construct Hamming code for the bit sequence 1001101. Show how the sender and receiver did. **[6m]**
Hasilkan kod Hamming bagi jujukan bit 1001101. Tunjukkan bagaimana penghantar dan penerima lakukan.

c) Compute the CRC-4 character for the message 1010011110 using a divisor constant of 1011. Show how the sender and receiver did. **[6m]**
Kira aksara CRC-4 bagi mesej 1010011110 menggunakan pembahagi tetap 1011. Tunjukkan bagaimana penghantar dan penerima lakukan.

9. Two nodes A and B are using sliding window **Go-Back-N ARQ** protocol with 4-bit frame field and window size is 6. Assuming nod A is a sender and nod B is a receiver, draw the position window for nod A and nod B for each activities below. Activities (a) through (d) are interrelated.
*Dua nod A dan B menggunakan protokol **ARQ kembali semula-N** dengan 4 bit medan kerangka dan saiz tetingkap adalah 6. Andaikan nod A adalah penghantar dan nod B adalah penerima, lukiskan posisi tetingkap bagi nod A dan nod B untuk setiap aktiviti di bawah. Aktiviti (a) sehingga (d) adalah berkaitan.*

a) Before sending any frames **[2M]**
Sebelum menghantar sebarang kerangka

b) Frames 0,1,2,3,4 are sent **[2M]**
Kerangka 0,1,2,3,4 dihantar

c) Received ACK3 **[2M]**
ACK3 diterima

d) Frames 5,6,7,8, are sent. **[2M]**
Kerangka 5,6,7,8, dihantar

e) Received NAK 7 **[2M]**
NAK 7 diterima

10. Given a Class A IP address: 44.19.5.153 **[2M]**
Diberi suatu alamat IP Kelas A: 44.19.5.153

a) If a subnet mask of 255.255.0.0 is used with this IP address, what is the network ID and host ID?
Sekiranya topeng subnet 255.255.0.0 digunakan terhadap alamat IP ini, apakah ID rangkaian dan ID hos?

b) What is the maximum hosts number that can be assigned? **[2M]**
Apakah bilangan maksimum hos yang boleh diumpukkan?

c) What is the maximum subnet numbers that can be created? **[2M]**
Apakah *bilangan maksimum subnet yang boleh dicipta?*

d) What is the effect of assigning a 255.255.255.255 subnet mask to this network? **[2M]**
Apakah kesannya menggunakan topeng subnet 255.255.255.255 terhadap rangkaian ini?

11. The number of needed usable host is **45** and the network address is **198.125.50.0.** Answer all questions below.
*Bilangan hos yang boleh digunakan adalah **45** dan alamat rangkaian adalah **198.125.50.0.** Jawab semua soalan di bawah.*

a) What is the address class? **[2M]**
Apakah alamat kelas?

b) What is the default subnet mask? **[2M]**
Apakah topeng subnet lalai?

c) What is the custom subnet mask? **[2M]**
Apakah topeng subnet custom?

d) Calculate the number bits borrowed. Show the calculation. **[3M]**
Kira bilangan bit yang dipinjam. Tunjukkan kiraan.

e) Calculate the total number host addresses. Show the calculation. **[3M]**
Kira jumlah bilangan alamat hos. Tunjukkan kiraan.

f) Calculate the number usable addresses. Show the calculation. **[3M]**
Kira bilangan alamat yang boleh digunakan. Tunjukkan kiraan.

g) Calculate the total number subnets. Show the calculation. **[3M]**
Kira jumlah bilangan subnet. Tunjukkan kiraan.

h) Calculate the second subnet range. Show the calculation. **[3M]**
Kira julat subnet kedua. Tunjukkan kiraan.

i) Calculate the subnet number for the second subnet. Show the calculation. **[3M]**
Kira bilangan subnet bagi subnet kedua. Tunjukkan kiraan.

j) Calculate the assignable addresses for the third subnet. Show the calculation. **[3M]**
Kira alamat yang diumpukkan bagi subnet ke tiga. Tunjukkan kiraan.

END OF QUESTIONS/*SOALAN TAMAT*