UTM
UNIVERSITI TEKNOLOGI MALAYSIA

Sekolah Pendidikan Profesional dan
Pendidikan Berterusan
(UTMSPACE)

FINAL EXAMINATION / *PEPERIKSAAN AKHIR*
SEMESTER 1 – SESSION 2016 / 2017
PROGRAM KERJASAMA

COURSE CODE : DDPC 2663
KOD KURSUS

COURSE NAME : OPERATING SYSTEMS
NAMA KURSUS *SISTEM PENGOPERASIAN*

YEAR / PROGRAMME : 2 DDPC
TAHUN / PROGRAM

DURATION : 2 HOURS 30 MINUTES / 2 *JAM 30 MINIT*
TEMPOH

DATE : OCTOBER 2016
TARIKH

INSTRUCTION/*ARAHAN* :

1. Answer **ALL** questions in the space provided in this question paper.
   Jawab SEMUA soalan di ruang yang disediakan dalam kertas soalan.

2. Candidates are required to follow all instructions given out by examination invigilators.
   Calon dikehendaki mematuhi semua arahab daripada penyelia peperiksaan.

(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 ...16... pages including the cover
Kertas soalan ini mengandungi ....16....... muka surat termasuk kulit hadapan

SECTION A / *BAHAGIAN A*
21 MARKS / *21 MARKS*

MULTIPLE CHOICES / *ANEKA PILIHAN*

Choose the most appropriate answer. Write your answer in the table provided on page 17.

Pilih satu jawapan yang paling tepat. Tulis jawapan anda pada jadual yang disediakan pada mukasurat 17.

1. The strategy of allowing processes that are logically runnable to be temporarily suspended is called

   Strategi yang membenarkan proses-proses yang boleh dilaksanakan secara ditangguhkan buat sementara waktu dipanggil

   A. Preemptive scheduling   / *Penjadualan yang boleh dihentikan*
   B. Non preemptive scheduling'   / *Penjadualan yang tak boleh dihentikan*
   C. Shortest job first   / *Kerja yang pendek dilakukan dulu*
   D. First come first serve   / *Kerja yang pertama tiba dilayan dahulu*

2. What is the name given to the organized collection of software that controls the overall operation of a computer?

   Apakah nama yang diberikan kepada satu koleksi perisian yang tersusun yang mengawal operasi keseluruhan sesuatu komputer?

   A. Working system   / *Sistem Kerja*
   B. Peripheral system   / *Sistem Persisihan*
   C. Operating system   / *Sistem Pengoperasian*
   D. Controlling system / *Sistem Pengawalan*

3. Which of the following about kernel of the operating system is **true**?

   *Mana antara berikut mengenai "kernel' sistem pengoperasian adalah **benar**?*

   A. Kernel remains in the memory during the entire computer session.
      'Kernel' sentiasa berada dalam memori semasa keseluruhan sesi komputer.
   B. Kernel is the last part of operating system to load into memory during booting process.
      'Kernel' adalah bahagian yang sistem pengoperasian terakhir yang dimuatkan ke dalam memori semasa proses membut.
   C. Kernel is made of several modules which cannot be loaded in running operating system.
      'Kernel' di buat dari berbilang modul yang tidak boleh dimuatkan dalam sistem pengoperasi yang sedang dilarikan.
   D. All of the above.
      Semua jawapan di atas.

4. Which one of the following is not a multitasking operating system?

   Mana antara berikut bukan sistem pengoperasian 'multitasking'?

   A. DOS   C. Unix
   B. Windows   D. Linux

5. Suppose that a process is in "Blocked" state waiting for some I/O service. When the I/O service is completed, it goes to the _____ .

   Andaikan satu proses dalam keadaan 'blok' menunggu untuk sevis I/O, Apabila servis I/O tamat, ia kan pergi ke _____ .

   A. Suspended state   */ keadaan gantung*
   B. Terminated state   */ keadaan terhenti*
   C. Running state   */ keadaan laksana*
   D. Ready state   */ keadaan sedia*

6. In a time-sharing operating system, when the time slot given to a process is completed, the process changes from the running state to the:

   Dalam sistem pengoperasian berkongsi-masa, apabila slot masa yang diberikan kepada proses tamat, proses itu bertukar dari keadaan laksana kepada:

   A. Blocked state   */ keadaan blok*
   B. Ready state   */ keadaan sedia*
   C. Suspended state   */ keadaan gantung*
   D. Terminated state   */ keadaan terhenti*

7. In a multi-programming system

   Dalam sistem pengaturcaraan berbilang

   A. the processor executes more than one process at a time.
      pemproses melaksana lebih dari satu proses pada satu masa.
   B. the programs are developed by more than one person
      aturcara dibangunkan oleh lebih dari satu orang.
   C. more than one process resides in the memory
      lebih dari satu proses berada di dalam memori.
   D. a single user can execute many programs at the same time
      satu pengguna melaksanakan banyak aturcara pada satu masa.

8. Belady's Anomaly is found in which of the following page replacement algorithms?
    'Belady's Anamoly' terdapat di dalam mana satu algoritma pengantian halaman berikut?

    A. LIFO, LRU
    B. LIFO, FIFO
    C. LIFO, FIFO, FRU
    D. FIFO, LRU

9. The memory allocation scheme that is subject to "external" fragmentation is _____ scheme.
    Skim allokasi memori yang mengalami cebisan ' luaran ' adalah skim _____.

    A. segmentation   */ segmentasi*
    B. swapping   */ bertukar-tukar*
    C. demand paging   */ penghalaman atas permintaan*
    D. multiple contiguous fixed partitions */ berbilang sekatan tetap yang berdampingan*

10. In multilevel feedback scheduling algorithm
    Dalam algoritma penjaduan suap-balik berbilang aras

    A. a process can move to a different classified ready queue
        satu proses boleh bergerak ke baris sedia yang dikelaskan yang lain.
    B. classification of ready queue is permanent
        pengkelasan baris sedia adalah tetap.
    C. processes are not classified into groups
        proses tidak dikelaskan ke dalam kumpulan.
    D. none of the mentioned above.
        Tiada mana-mana yang dinyatakan di atas.

11. Which of the following are features of the Unix operating system?
    Manakah antara berikut ciri-ciri sistem pengoperasian Unix?

    A. Allow more than one person to communication with the computer.
        Membenarkan lebih dari seorang berkomunikasi dengan computer.
    B. Allow users to share or restrict access to their files.
        Membenarkan pengguna berkongsi atau melarang pencapaian fail mereka.
    C. Allow a routine series of Unix OS commands to be run automatically as shell scripts.
        Membenarkan satu rutin siri perintah SP Unix dilarikan secara otomatik sebagai skrip cengkerang.
    D. All of the above are features of the Unix OS.
        Semua di atas adalah ciri SP Unix.

12. Which of the following Unix OS commands will provide information regarding a process that you wish to terminate?

Manakah perintah SP Unix berikut yang memberi maklumat mengenai sesuatu proses yang anda ingin tamatkan?

A. ps
B. process
C. <CTRL><c>
D. kill -9

13. Contiguous allocation of a file is defined by: (choose all that apply)

Peruntukan berdampingan fail ditakrifkan oleh: (Pilih semua yang berkenaan)

i.	total size of the file	/ jumlah saiz fail
ii.	disk address of the first block	/ alamat disk bagi blok pertama
iii.	length	/ panjang
iv.	size of the block	/ saiz blok

A. i, and iii
B. ii, iii, iv
C. ii, and iii
D. i,ii, and iv

14. Consider a disk queue with requests for I/O to blocks on cylinders is as follows:

98 183 37 122 14 124 65 67

Considering SSTF scheduling, the total number of head movements is, if the disk head is initially at 53 is

_____

Andaikan barisgilir dengan permintaan untuk blok I/O pada silinder adalah seperti berikut:

98 183 37 122 14 124 65 67

Andaikan penjadualan SSTF, jumlah bilangan pergerakan kepala jika kepala disk bermula pada 53 adalah _____

A. 224
B. 236
C. 245
D. 240

SECTION B / *BAHAGIAN B*

79 MARKS / *79MARKAH*

ANSWER ALL QUESTIONS. ANSWER IN THE SPACES PROVIDED

JAWAB SEMUA SOALAN. JAWAB PADA RUANG YANG DISEDIAKAN.

Q1. a) Explain the following terms: [8 M]

Terangkan istilah berikut:

   a) Process / *Proses*

   b) Deadlock / *Kunci mati*

   c) Race condition / *Keadaan Lumba*

   d) Internal fragmentation / *Fragmentasi dalaman*

Q2. Consider the following set of processes with the length of the CPU burst time given in milliseconds

Andaikan set proses-proses berikut dengan masa CPU di dalam milisaat.

Process	CPU Burst Time	Priority
p1	10	3
p2	1	1
p3	2	3
p4	1	4
p5	5	2

The processes are assumed to have arrived in the order p1, p2, p3, p4, and p5 all at time 0.

Andaikan semua proses tiba dalam turutan p1 ,p2, p3 ,p4, dan p5 pada masa 0.

a. Draw four(4) Gantt charts illustrating the execution of these processes using FCFS, SJF, a non preemptive priority (a smaller priority number implies a higher priority) and RR(quantum=2) scheduling. **[8 M]**

Lakar empat(4) carta Gantt mengambarkan perlaksanaan proses-proses ini menggunakan penjadualan FCFS, SJF, prioriti yang tidak boleh dihentikan (nilai priotiti yang kecil menunjukkan prioriti tinggi) dan RR (quantum =2).

b) What is the waiting time of each process for each of the scheduling algorithms in part a? **[8 M]**

Apakah masa tunggu bagi setiap proses untuk setiap algoritma penjadualan di bahagian a?

	Waiting time/ Masa Tunggu FCFS	Waiting time/ Masa Tunggu SJF	Waiting time/ Masa Tunggu Non-Preemptive Priority	Waiting time/ Masa Tunggu RR = 2
P1				
P2				
P3				
P4				
P5				

c) Which of the schedules (in part a) results in the minimal average waiting time? **[2 M]**

Manakah penjadualan (pada bahagian a) yang mempunyai purata masa tunggu yang minimal?

Q2. a) Describe the following allocation algorithms: [3 M]

Terangkan algoritma allokasi berikut:

    i.   First fit :_____

    ii. Best fit : _____

    iii. Worst fit : _____

b) Consider a multiple allocation. Assume that we have 2560K of memory available and a resident operating system of 400K. Given the input queue as in table below and FCFS scheduling. Allocate the processes in the job queue and show the memory map. What happen? Draw the memory map at several instance: at time 5, 8, 10, 15. [10 M]

Mengambil kira peruntukan yang pelbagai. Menganggap bahawa kita mempunyai 2560K memori yang tersedia dan sistem operasi 400K yang berada dalam memori. Diberi baris gilir input seperti dalam Jadual di bawah dan penjadualan FCFS. Agihkan proses dalam barisan kerja dan tunjukkan pemetaan memorinya. Apa yang berlaku? Lukis pemetaan ingatan pada beberapa keadaan: pada masa 5, 8, 10, 15.

Job Queue		
process	memory	time
P1	600K	10
P2	1000K	5
P3	300K	20
P4	700K	8
P5	500K	15
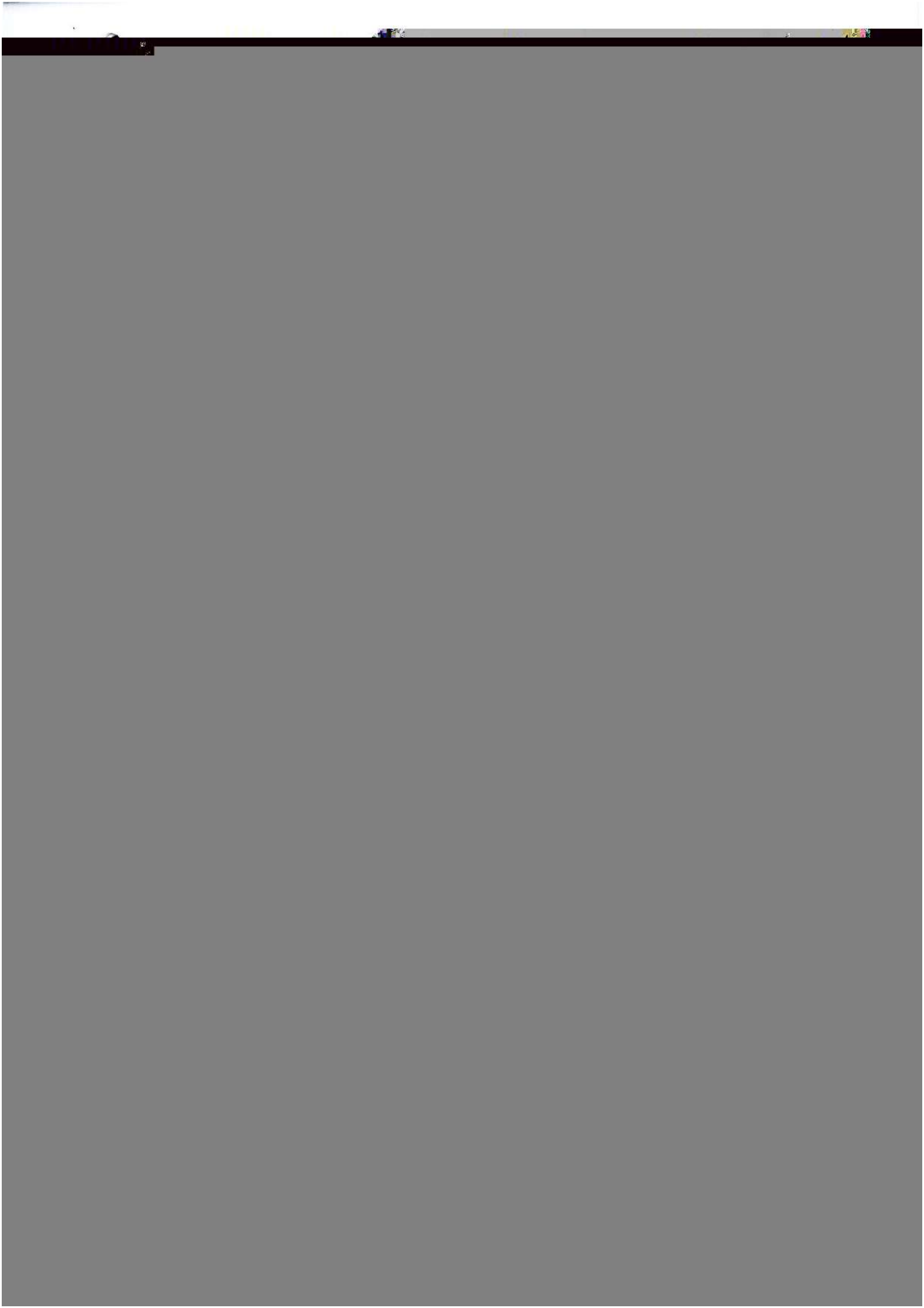
Q4. In pure on-demand paging method, a page replacement policy is used to manage system resources. Suppose that a newly-created process has **3 page frames** allocated to it, and then generates the page references indicated below.

A B C B A D A B C D A B A C B D

i.	How many page faults would occur using FIFO page replacement? Show your working.	[4 M]
ii.	How many page faults would occur using LRU page replacement? Show your working.	[4 M]
iii.	How many page faults would occur using OPT page replacement? Show your working.	[4 M]

Dalam kaedah halaman atas permintaan tulen, polisi pe▓▓▓▓▓▓ halaman digunakan untuk

Q5. Diagram below shows UNIX directory system. Answer the following questions based on the diagram given.

Rajah di bawah menunjukkan direktori sistem UNIX. Jawab soalan berikut berdasarkan rajah yang diberi.

```
                              /
      ┌──────┬──────┬──────┬──────┬──────┐
     dev    bin   home    etc    var
               ┌──────┬──────┐
             Aizat  Ashman  Aqeem
                ┌──────┬──────┐
             Assign  Project  Homework
          ┌──────┬──────┐        ┌──────┐
      Prog1.C Prog2.C Prog3.C  HW1.txt HW2.doc
```
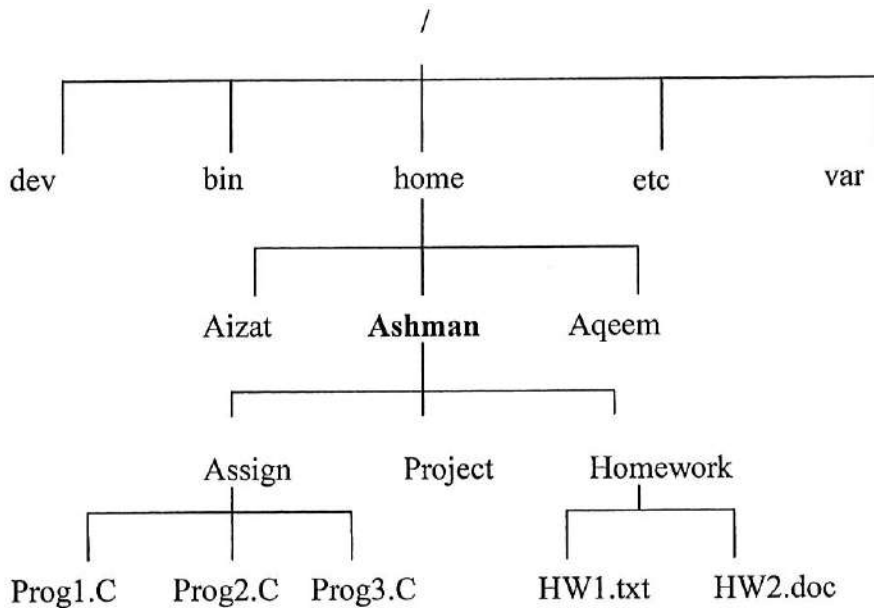
Assuming that you login as user named **Ashman**.
*Andaikan anda login sebagai pengguna **Ashman**.*

a) State your login name.
    Nyatakan nama login anda. [1 M]

b) Write your home directory pathname. [1 M]
    Tuliskan nama laluan bagi direktori rumah anda.

c) State the command that you will use to change from your home directory to a directory
    named **Assign**. [1 M]
    *Nyatakan perintah yang anda akan gunakan untuk menukar dari direktori rumah ke
    direktori bernama **Assign**.*

d) State the command to make a copy of your file named **Prog2.C** to directory named **Project**. [2 M]
    *Nyatakan perintah untuk membuat salinan fail bernama **Prog2.C** ke direktori bernama **Project**.*

e) Give the pathname for the file named **HW1.txt**.

[2 M]

*Berikan nama laluan bagi fail bernama **HW1.txt**.*

_____

f) Assuming your current working directory is **~/homework** and you want to delete file **HW2.doc**, what command will you use?

[2 M]

*Andaikan direktori kerja semasa anda adalah **~/homework** dan anda hendak menghapuskan fail bernama **HW2.doc**, apakah perintah yang akan anda gunakan?*

_____

g) Rename the file **Prog3.C** to **Exer_1.C**

[2 M]

*Namakan semula fail **Prog3.C** ke **Exer_1.C***

_____

Q6. a) Questions i - iii are based on Figure 2 below.

Soalan i – iii berdasarkan Rajah 2 di bawah.

```
-rwxrwx---   1   ee51ab   512    March 12 2013  11.45    Arsenal.exe
-rw-------   1   ee51ab   2890   May   10 2013  12.00    Giroud.txt
drwxrwx---   1   ee51ab   1027   June  10 2013   2.45    Lab1.c
drwxrw----   1   ee51ab   512    Aug    1 2011   1.00    Assign1
             ↑            ↑
             ❶            ❷
```

Figure 2 / Rajah 2

i. In UNIX, which command will produce listing such as Figure 2?

[1 M]

Dalam UNIX, command mana yang menghasilkan senarai seperti Rajah 2?

ii. Column marked by ❶ indicates _____.

[1 M]

Lajur yang bertanda ❶ menunjukkan _____.

iii. Column marked by ❷ indicates _____.

[1 M]

Lajur bertanda ❷ menunjukkan _____.

b) Suppose you have a directory named **Project** containing the following files:

*Andaikan anda mempunyai direktori yang bernama **Project** yang mengandungi fail-fail berikut:*

prog1.c	aero1	assgm
prog2.cpp	status	data.txt
prog3.exe	tug3.cpp	datapelajar.txt
project1.c	tug4.cpp	datar.txt
project2.cpp	tug5.cpp	project

What will be listed if you enter the following commands: **[6 M]**

Apakah yang akan disenaraikan jika arahan berikut dimasukkan:

i. $ ls d*.*

ii. $ ls prog?.*

iii. $ ls *ro*

ANSWER SPACE FOR SECTION A /24 MARKS

RUANG JAWAPAN BAGI BAHAGIAN A /24MARKAH

1		8	
2		9	
3		10	
4		11	
5		12	
6		13	
7		14	

END OF QUESTIONS/ *SOALAN TAMAT*

Mukasurat ini sengaja dibiarkan kosong

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