



STAMFORD COLLEGE
SCHOOL OF COMPUTER SCIENCES
DIPLOMA IN INFORMATION TECHNOLOGY

STC206 : DATA COMMUNICATION & OPERATING SYSTEM

Date : 15 March 2005 (Tuesday)

Time : 9.00 a.m. – 11.00 a.m.

Duration: 2 hours

Instructions to Candidates

Answer ALL questions.

Please ensure that this examination paper contains FOUR questions on THREE printed pages before you start the examination.

Books, papers and other written materials are not allowed to be brought into the examination hall. A candidate who violates the examination rules of Stamford College or commits a malpractice will be disqualified from the examination.

Candidates may use calculators provided the calculators give no printout, have no work display facilities, are silent and cordless.

Write your Examination Index Number on each page of your answer booklet.

ANSWER ALL THE QUESTIONS.

Question 1

- (a) A segmented system is not a popular option for implementing virtual memory. Explain why and suggest an alternative for implementing virtual memory. (5 Marks)
- (b) Which is easier to implement: shortest job first (SJF) or first come first served (FCFS)? Explain your answer. (5 Marks)
- (c) Explain the following Internet facilities:
- (i) E-mail
 - (ii) Telnet
 - (iii) FTP
 - (iv) Search Engine
- (10 Marks)
(Total = 20 Marks)

Question 2

- (a) Why are directories necessary? (6 Marks)
- (b) What are the differences between a non pre-emptive scheduling policy and a pre-emptive scheduling policy? (4 Marks)
- (c) Suppose that jobs arrive according to the following schedule:

Process	Starting Time	Run Time
A	0	12
B	3	7
C	6	2
D	8	5
E	9	2
F	12	12

Trace the progress of the system with the aid of a timeline chart if the scheduler used is:

- (i) First Come First Serve
 - (ii) Shortest Remaining Time
- (10 Marks)
(Total = 20 Marks)

Question 3

- (a) What is a Page Replacement Policy? Give two examples of Page Replacement Policy. (5 Marks)

- (b) Given the following information:

Memory allocated for blocks(size in KB):	Process(size in KB)
Block 1 - 30	Process 1 - 10
Block 2 - 120	Process 2 - 25
Block 3 - 45	Process 3 - 115
Block 4 - 50	Process 4 - 43
Block 5 - 70	Process 5 - 55

Show, with the aid of a diagram, the final result of memory allocated for the above processes using the following allocation schemes:

- (i) First Fit
- (ii) Best Fit
- (iii) Worst Fit

(15 Marks)
(Total = 20 Marks)

Question 4

- (a) What is Virtual Memory? (2 Marks)

- (b) There are I/O requests currently pending for blocks on tracks 1, 3, 8, 11, 15, and 16. The disk arm is currently at track 9 and moving upwards. In what order will these requests be handled if the following algorithms are used to schedule the disk-arm:

- (i) Shortest Seek Time First
- (ii) LOOK

(18 Marks)
(Total = 20 Marks)

Question 5

- (a) Describe one key difference between circuit and packet switching technique for wide area networks.
(6 Marks)
- (b) How wireless networking can benefit your college? State three benefits and explain them in detail.
(6 Marks)
- (c) Draw and name the layers of the Open System Interconnection (OSI) model. Also, give an example of a Layer 3 device.
(8 Marks)
- (Total = 20 Marks)

- END OF PAPER -