

**NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**FACULTY OF APPLIED SCIENCE**  
**COMPUTER SCIENCE DEPARTMENT**  
**APRIL EXAMINATIONS 2009**

**SUBJECT: OPERATING SYSTEM CONCEPTS**  
**CODE: SCS1103**

**INSTRUCTION TO CANDIDATES**

The question paper contains **six** questions. Answer any **five** questions  
All questions carry equal marks.

**3 HOURS**

**QUESTION ONE**

- a) List four types of Operating Systems briefly explaining each. [8]
- b) Outline the role of the Operating System in memory management. [6]
- c) Write DOS commands that do the following:
  - (i) create a directory
  - (ii) delete a file called **symptom.txt**
  - (iii) change a directory
  - (iv) remove a directory [4]
- d) Explain what a kernel of an Operating system is. [2]

**QUESTION TWO**

- a) With the help of a relevant illustration, explain the Bankers Algorithm. [10]
- b) Discuss **processes** and **threads** clearly showing similarities and differences between the two concepts. [10]

**QUESTION THREE**

- a) Explain the bootstrap process of a computer with Windows 95 as the Operating System [4]
- b) Outline differences of a Unix like OS and Windows NT in file management. [8]
- c) What is a deadlock? What are conditions that must hold for a deadlock to occur? [6]
- d) Explain the concept of Direct Memory Addressing. [2]

#### QUESTION FOUR

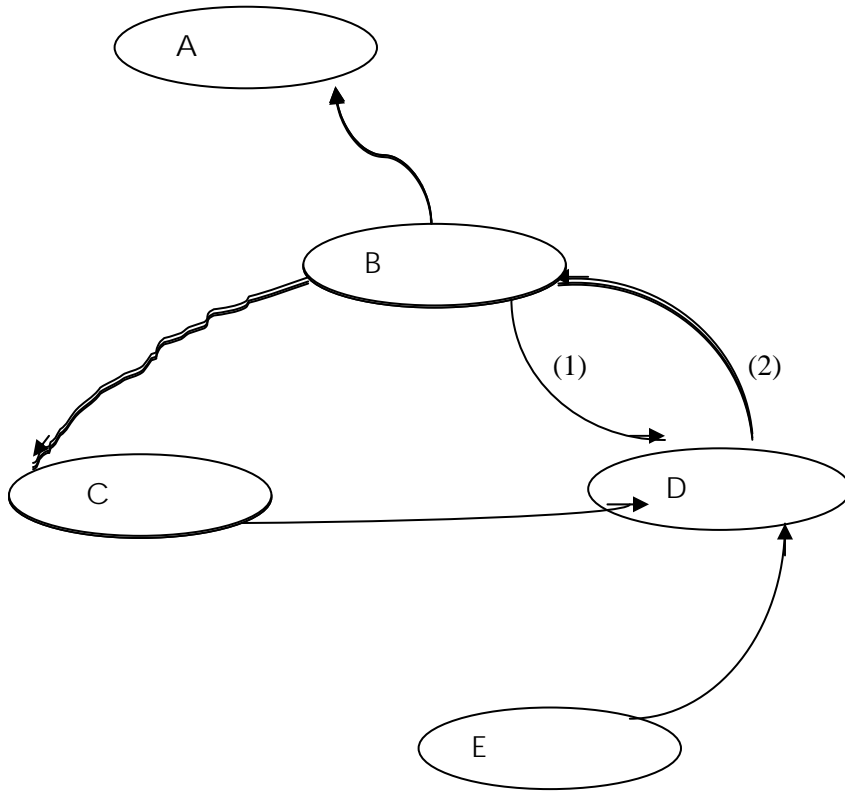
- a) In what way does multiprogramming and relocation affect the loading of machine code into a computer's main memory? [6]
- b) Explain the following terms:
  - (i) Segmentation
  - (ii) Paging
  - (iii) Swapping[3]
- c) Outline **three** disk scheduling algorithms. [3]
- d) With the aid of a diagram, show the memory hierarchy of a computer [6]
- e) What is a device driver? How does it work? [2]

#### QUESTION FIVE

- a) Explain the stack concept used in a microprocessor. Which operation needs to use stack in order to be proceed correctly? [4]
- b) (i) Define race conditions [2]  
  
(ii) Discuss two methods that can be used to prevent race conditions [4]
- c) Explain available file access methods clearly showing their similarities and differences where necessary. [6]
- d) Distinguish between user level threads and kernel level threads. [3]
- d) Which file structure would you prefer if the only thinggg that matters is access speed? [1]

## QUESTION SIX

The diagram below shows transition between processes.



- a) (i) Show the status of processes labelled A to E [5]  
(ii) Explain the transitions represented by (1) and (2) [2]
- b) Explain the difference between preemptive and non-preemptive scheduling algorithms. [4]
- c) With as much detail as possible, discuss how an I/O request is served in Windows NT. [5]
- d) What is an interrupt and in what circumstances is it used? [4]

END OF QUESTION PAPER