TECHNICAL UNIVERISTY OF MOMBASA

Faculty of Engineering & Technology

DEPARTMENT OF COMPUTER SCIENCE & INFORMATION TECHNOLOGY

UNIVERSITY EXAMINATION FOR DEGREE IN:
BACHELOR OF SCIENCE IN INFORMATION TECHNOLOGY
(BSIT 13S – Y2 S1)

ICS 2208: OPERATING SYSTEM II

END OF SEMESTER EXAMINATION
SERIES: DECEMBER 2014
TIME: 2 HOURS

Instructions to Candidates:
You should have the following for this examination
- *Answer Booklet*
This paper consists of **FIVE** questions. Attempt question **ONE (Compulsory)** and any other **TWO** questions
Maximum marks for each part of a question are as shown
This paper consists of **TWO** printed pages

Question One (Compulsory)

a) Identify various types of resources that can usefully be shared in computer networks. Give examples of their sharing as it occurs in distributed systems **(7 marks)**

b) Discuss briefly key challenges that one needs to address in the design and development of distributed application **(7 marks)**

c) Discuss peer-to-peer architectural model for construction of distributed systems **(6 marks)**

d) Explain TWO examples of distributed systems **(4 marks)**

e) Briefly explain THREE methods of handling deadlocks in distributed systems **(6 marks)**

Question Two

a) Define the following terms as used in distributed system: **(6 marks)**
    (i) Middleware
    (ii) Marshalling
    (iii) Process

b) Enumerate and explain THREE aspects of transparency **(6 marks)**

c) Explain FOUR reasons for process migration **(8 marks)**

Question Three

a) Write a simple COBRA program that demonstrates the invocation of remote object services. For example, when a client sends a message "Help" the server responds with "Hi There" **(5 marks)**

b) Write a simple RMI program that demonstrates the invocation of remote object services. For example when a client sends a message. "Ring", the server responds with "Pont" **(5 marks)**

c) Discuss model architecture of distributed file system and its components **(5 marks)**

d) Identify main types of security threats that might occur in the internet with an example
(5 marks)

Question Four

a) With the aid of a diagram, describe Remote Procedure call steps **(10 marks)**

b) Discuss important operating systems services that are essential for supporting the development of current and scalable distributed systems **(5 marks)**

c) Discuss techniques for achieving high-performance in distributed file systems **(5 marks)**

Question Five

a) Briefly explain the happened-before algorithm **(6 marks)**

b) Consider a system consisting of processes P_1, P_2, P_3 and P_4. Suppose that processor P_2, P_3 and P_4 want to enter their critical sections. The following are their time stamps P_1 (TS = 6), P_2 (TS = 3) P_3 (TS = 9) and P_4 (TS = 8). Using an illustration, explain the algorithm for implementing mutual exclusion **(14 marks)**