MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF COMPUTING AND INFORMATION TECHNOLOGY

DEPARTMENT OF INFORMATION TECHNOLOGY

UNIVERSITY ORDINARY EXAMINATION

2017/2018 ACADEMIC YEAR

SECOND YEAR **FIRST** SEMESTER EXAMINATION FOR THE DEGREE OF BACHELOR OF SCIENCE IN COMPUTER SCIENCE AND MATHEMATICS

SIT 102 – OPERATING SYSTEMS

DURATION: 2 HOURS

DATE: 15TH DECEMBER, 2017

TIME: 9.00 – 11.00 A.M.

Instructions to Candidates:

1. Answer **Question 1** and **Any Other Two** questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

SECTION ONE - COMPULSORY

QUESTION ONE

(a) State FOUR advantages of distributed operating system (4 Marks)

(b) Describe TWO types of buffering as used in memory management (4 Marks)

(c) Describe the following services provided by an operating systems: (6 Marks)

i. Program execution

ii. Communication

iii. Error detection

(d) State FOUR benefits of Batch processing systems (4 Marks)

(e) Differentiate between client-server model and layered system structures of operating system (4 Marks)

(f) Differentiate between Direct Memory Access and Device Controllers as used in operating system (4 Marks)

(g) State FOUR advantages of virtual memory technique as used in operating system (4 Marks)

SECTION TWO – ANSWER ANY TWO QUESTIONS

QUESTION TWO

(a) Describe THREE ways of deadlock prevention (6 Marks)

(b) (i) Explain how a page fault may occur in paging technique (8 Marks)

(ii) Describe the following page replacement strategies:

a. Optimal page replacement algorithm

b. FIFO (First in First out) page replacement

c. LRU (Last recently used) algorithm

(c) Describe the following types of hardware terminals: (6 Marks)

a. Dump terminals

b. Smart terminals

c. Intelligent terminals

QUESTION THREE

(a) (i) Describe the term Deadlock as used in operating system (8 Marks)

(ii) Explain THREE conditions for occurrence of deadlock

(b) Explain THREE differences between paging and segmentation (6 Marks)

(c) Explain the following concepts in relation to inter-process communication (IPC): (6 Marks)

i. Race condition

ii. Critical section

iii. Message passing

QUESTION FOUR

(a) Explain THREE differences between Batch and Real time processing systems (6 Marks)

(b) Describe THREE different principles which must be considered when selecting scheduling algorithm (6 Marks)

(c) (i) Describe contiguous file allocation in relation to secondary memory organization

(ii) Explain THREE advantages of contiguous files allocation (8 Marks)