ROLL NO. _____

Code: DC61/DC110 Subject: OPERATING SYSTEMS & SYSTEMS SOFTWARE

DipIETE – CS (Current & New Scheme)

Time: 3 Hours

DECEMBER 2015

Max. Marks: 100

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- **Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.**
- **The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions, selecting at least TWO questions from each Part. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1 Choose the correct or the best alternative in the following: (2×10)

a. An operating system is .....

(A) system software **(B)** application software
(C) hardware component **(D)** I/O Device

b. A program is.....

(A) A device that performs a sequence of operations
(B) A device where information are stored
(C) A sequence of instructions
(D) None of the above

c. The main function of the dispatcher is .....

(A) Swapping a process to the disk
(B) Assigns ready process to the CPU
(C) Suspending some of the processes when the CPU load is high
(D) bring the processes from the disk to the main memory

d. Semaphores are used

(A) To do I /O
(B) Synchronize critical resources to prevent contention
(C) Synchronize critical resources to prevent deadlocks
(D) Allows processes to communicate with one another

e. Four necessary conditions for deadlock to exist are mutual exclusion, no preemption, circular wait and

(A) hold and wait **(B)** multiprogramming
(C) race around condition **(D)** buffer flow

f. Logical memory is broken into blocks of the same size called _____.

(A) frames **(B)** pages
(C) backing store **(D)** None of these

g. The size of a page is typically :

(A) varied **(B)** power of 2
(C) power of 4 **(D)** None of these

h. .....is the concept in which a process is copied into main memory from the secondary memory according to the requirement.

(A) Paging **(B)** Demand paging
(C) Segmentation **(D)** Swapping

i. In a ..... real time system, it is guaranteed that critical real time tasks will be completed within their deadlines.

(A) soft **(B)** hard
(C) critical **(D)** None of these

j. Memory management units :

(A) increase the cost of the system
(B) increase the power consumption of the system
(C) increase the time required to complete an operation
(D) All of these

PART A
Answer at least TWO questions. Each question carries 16 marks.

Q.2 a. Give four major functions of an operating system. **(4)**

b. Explain the following terms- (Do any three) **(9)**
(i) Serial Processing
(ii) Batch processing
(iii) Multi processing
(iv) Multitasking
(v) Network operating system

c. With the help of figure explain the state transition for a process. **(3)**

Q.3 a. Describe the various type of schedulers. **(5)**

b. Explain the objectives of scheduling. **(5)**

c. What is deadlock? List four necessary conditions for the occurrence of deadlock. **(6)**

Q.4 a. What is control synchronization? **(4)**

b. What is critical section and highlight the essential properties of critical section used during implementation? **(6)**

c. What are semaphores? How are they implemented in operating systems? **(6)**

Q.5 a. Explain the difference between internal and external fragmentation with examples. **(8)**

b. What is virtual memory? Describe its advantages with respect to user point of view and system point of view. **(8)**

PART B

Answer at least TWO questions. Each question carries 16 marks.

Q.6 a. Define language processor and highlight the practical requirements which language processor should meet. **(5)**

b. What is static binding and dynamic binding? **(3)**

c. Explain the following terms:
(i) Stack (ii) Heap
(iii) Grammar (iv) Parse tree **(8)**

Q.7 a. What is parsing? Write down the algorithm for bottom up parsing. **(6)**

b. Compare & contrast macro definition and macro expansion. **(4)**

c. Write the steps which are required for the execution of a program written in a language. **(4)**

d. Explain the term self relocating program. **(2)**

Q.8 a. What are the elements of assembly language program? **(5)**

b. Mention some advantages of assembly language over machine language. **(5)**

c. Explain the design of a two pass assembler. **(6)**

Q.9 a. Explain the different phases of a compiler. **(6)**

b. Differentiate between compiler and Interpreter. **(4)**

c. Define the following : **(6)**
(i) Memory allocation in block structured language
(ii) A toy code generator for expression