ROLL NO. _____

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

DipIETE – CS (Current & New Scheme)

Time: 3 Hours **December 2016** **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. UNIX is _____.
(A) an application software **(B)** a hardware component
(C) an operating system **(D)** a CPU

b. A program in execution is called _____.
(A) process **(B)** CPU
(C) PCB **(D)** None of these

c. PCB stands for _____.
(A) Process Control Block **(B)** Printer Control Block
(C) Process Control Buffer **(D)** None of these

d. A _____ on a data item arises when many processes concurrently update its value.
(A) semaphore **(B)** race condition
(C) critical section **(D)** none of these

e. When a process completes its execution, it goes to the _____ state.
(A) ready **(B)** blocked
(C) terminated **(D)** None of these

f. At any moment of time, a user is said to be 'in' a specific directory, known as _____ directory.
(A) home **(B)** current
(C) parent **(D)** None of these

g. The contiguous memory allocation model requires a program to be allocated _____.
(A) a single contiguous area of memory
(B) non contiguous area of memory
(C) Both **(A)** and **(B)**
(D) None of these

h. _____ is used to bridge an execution gap without generating a machine language program.
(A) source program **(B)** target program
(C) interpreter **(D)** compiler

i. Among translation, linking, relocation and loading of a program which step is done first, while executing that program?
(A) linking **(B)** relocation
(C) loading **(D)** translation

j. In _____, memory bindings are established and destroyed during the execution of a program.
(A) static memory allocation
(B) dynamic memory allocation
(C) both static and dynamic memory allocations.
(D) None of these

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

Q.2 a. Explain major features of any two types of operating systems. **(4+4)**

b. What is a Process Control Block? Explain in detail its contents. **(2+6)**

Q.3 a. Explain the following scheduling policies: **(4+4)**
(i) First Come First Serve (FCFS)
(ii) Round Robin (RR)

b. Define the term deadlock. Write down the two fundamental approaches used for handling deadlocks. When a system is said to be in a state of deadlock? **(2+2+4)**

Q.4 a. Define access path. Explain absolute access paths and relative access paths with the help of suitable example. **(2+6)**

b. Write a short note on each of the following: **(4+4)**
(i) Critical Section
(ii) Semaphores

Q.5 a. Explain how memory is allocated to programs in contiguous memory allocations. Explain any two techniques to overcome the problem of fragmentation. **(4+4)**

b. With the help of an example explain FIFO page replacement policy. **(8)**

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

Q.6 a. What are allocation data structures? Explain stack as allocation data structure. **(2+6)**

b. Write a short note on each of the following: **(4+4)**
(i) Language Processor
(ii) Program execution

Q.7 a. Write a short note on scanning and parsing. **(4+4)**

b. Explain the following terms: **(4+2+2)**
(i) Macro definition & macro call
(ii) Macro expansion
(iii) Self relocating programs

Q.8 a. Write a note on the pass structure of assembler. **(8)**

b. What is the need of an assembler? List down the advantages and disadvantages of assembly language programming. **(2+3+3)**

Q.9 a. What is Memory Allocation? Discuss Array Allocation and Access. **(1+7)**

b. With the help of a suitable example explain, how static memory allocation can allocate more memory than dynamic memory allocation? **(8)**