Code: DC61   **Subject: OPERATING SYSTEMS & SYSTEMS SOFTWARE**

DiplETE – CS

Time: 3 Hours   **DECEMBER 2014**   **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. Interprocess communication

   (A) is required for all processes
   (B) is usually done via disk drives
   (C) is never necessary
   (D) allows processes to synchronize activity

b. Process is

   (A) program in High level language kept on disk
   (B) contents of main memory
   (C) a program in execution
   (D) a job in secondary memory

c. Debugging is:

   (A) creating program code
   (B) finding and correcting errors in the program code
   (C) identifying the task to be computerized
   (D) creating the algorithm.c

d. Virtual Memory is commonly implemented by _____.

   (A) Segmentation   **(B)** Swapping
   (C) Demand Paging   **(D)** None of these

e. The operating system manages _____.

   (A) Memory   **(B)** Processor
   (C) Disk and I/O devices **(D)** All of these

f. A binary semaphore

(A) has the values one or zero   (B) is essential to binary computers
(C) is used only for synchronisation (D) is used only for mutual exclusion

g. _____ OS pays more attention on the meeting of the time limits

(A) Distributed   (B) Network
(C) Real time   (D) Online

h. A macro definition consists of

(A) A macro prototype statement
(B) One or more model statements
(C) Macro preprocessor statements
(D) All of these

i. Which statement is valid about interpreter?

(A) It translates one instruction at a time
(B) Object code is saved for future use
(C) Repeated interpretation is not necessary
(D) All of these

j. The translator program used in assembly language is called

(A) Compiler   (B) Interpreter
(C) Assembler   (D) Translator

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

Q.2 a. Define Process. With the help of figure explain the fundamental state transitions for a process.   **(2+5)**

b. Explain the following terms: (any three)   **(3×3)**
   (i)Time sharing OS
   (ii)Multiprogramming systems
   (iii)Real time OS
   (iv)SPOOLING

Q.3 a. What are deadlock prevention techniques?   **(6)**

b. Describe the FCFS scheduling algorithm.   **(4)**

c. Write the algorithm for deadlock detection? Also give the data structures used in the algorithm.   **(4+2)**

Q.4   a.   What is Context Switch?   **(4)**

       b.   Explain the allocation method of disk space.   **(6)**

       c.   What is the critical section (CS) problem? Write the properties of CS implementation.   **(6)**

Q.5   a.   Briefly describe the paging concept in memory management.   **(6)**

       b.   Explain the virtual memory concept.   **(5)**

       c.   What is fragmentation? Describe different types of fragmentation.   **(5)**

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

Q.6   a.   What are the benefits of using "language processors"?   **(5)**

       b.   What do you understand by the term System Software?   **(3)**

       c.   What are the various language processing activities in the domain of system software? What do you understand by cross-compilation?   **(8)**

Q.7   a.   What is parsing? Write down the drawback of top down parsing of backtracking.   **(5)**

       b.   Define Macro expansion. What do you mean by positional parameters and how the value of a positional, formal parameter is determined?   **(2+2+2)**

       c.   Compare and contrast non-relocatable, relocatable and self-relocatable programs.   **(5)**

Q.8   a.   Mention some advantages of assembly language over machine language.   **(5)**

       b.   What are assembler directives in assembly languages? Illustrate with an example the importance of assembler directives.   **(6)**

       c.   What are the data structures used during pass I of the Assembler?   **(5)**

Q.9   a.   What are the major stages in the process of compilation?   **(5)**

       b.   Explain analysis and synthesis phase of a compiler.   **(8)**

       c.   Differentiate between static & dynamic memory allocation.   **(3)**