

**DiplETE – CS**

Time: 3 Hours

**DECEMBER 2012**

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. The translator program used in assembly language is called
- (A) Compiler (B) Interpreter  
(C) Assembler (D) Translator
- b. 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. The operating system manages \_\_\_\_\_
- (A) Memory (B) Processor  
(C) Disk and I/O devices (D) All of these
- d. The Hardware mechanism that enables a device to notify the CPU is called \_\_\_\_\_
- (A) Polling (B) Interrupt  
(C) System Call (D) None of these
- e. Virtual Memory is commonly implemented by \_\_\_\_\_
- (A) Segmentation (B) Swapping  
(C) Demand Paging (D) None 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. A program in execution is called \_\_\_\_\_
- (A) Dynamic program                      (B) Static program  
(C) Binded Program                      (D) A Process
- h. \_\_\_\_\_ OS pays more attention on the meeting of the time limits.
- (A) Distributed  
(B) Network  
(C) Real time  
(D) Online
- 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. Most modern software applications enable you to customize and automate various features using small custom-built “miniprograms” called:
- (A) macros                                      (B) code  
(C) routines                                      (D) subroutines

**PART A**

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

- Q.2** a. Explain the batch processing systems. (4)
- b. Differentiate between process and a program. (4)
- c. Explain the following terms: (any **TWO**)
- (i) Time sharing OS  
(ii) Multiprogramming systems  
(iii) Real time OS  
(iv) Process States (4+4)
- Q.3** a. What is RRAG and WFG? Give examples. Explain use of both the graphs in deadlock detection. (6)
- b. Define Deadlock. Explain the four necessary conditions of the deadlock. (6)
- c. Describe the FCFS scheduling algorithm using suitable example. (4)
- Q.4** a. Explain the critical section problem. (4)
- b. Discuss Dining Philosophers problem. Give a solution outline for this problem. (6)

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- c. Explain two approaches to non-contiguous disk space allocation. (6)
- Q.5** a. Briefly describe the paging concept in memory management. (6)
- b. Explain the virtual memory concept. (5)
- c. Differentiate between the contiguous and non-contiguous memory allocation. (5)

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

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- Q.6** a. What do you understand by the term System Software? (3)
- b. What are the benefits of using "language processors"? (5)
- c. What are the various *language processing* activities in the domain of system software? What do you understand by *cross-compilation*? (4+4)
- Q.7** a. What is parsing? Write down the drawback of top down parsing with backtracking. (4)
- b. Explain positional & keyword parameters used in lexical expansion. (6)
- c. Comment on the following:  
(i) Self relocating programs are less efficient than relocatable program.  
(ii) There would be no need for linkers if all programs are coded as self relocating programs. (6)
- Q.8** a. Mention some advantages of assembly language over machine language. (4)
- b. What are *assembler directives* in assembly languages? Illustrate with an example the importance of assembler directives. (6)
- c. Discuss four step approach to develop a design specification for an assembler. (6)
- Q.9** a. What do you mean by side effect of a function call? Discuss three set of features – parameter list, save area and calling conventions, used by compiler to implement function calls. (8)
- b. Discuss how an interpreter is different from a compiler. What are main components an interpreter consists of? Discuss. (8)