

**DipIETE – CS (NEW SCHEME) – Code: DC61**

**Subject: OPERATING SYSTEMS & SYSTEMS SOFTWARE**

**Time: 3 Hours**

**DECEMBER 2011**

**Max. Marks: 100**

**NOTE: There are 9 Questions in all.**

- Please write your Roll No. at the space provided on each page immediately after receiving the Question Paper.
- 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. .... is the technique of temporarily removing inactive programs from the memory of a computer system.

- |              |                   |
|--------------|-------------------|
| (A) Swapping | (B) Segmentation  |
| (C) Paging   | (D) Demand paging |

b. PCB stands for .....

- |                               |                           |
|-------------------------------|---------------------------|
| (A) Printed Circuit Board     | (B) Process Control Block |
| (C) Program Controlling Block | (D) None of the above     |

c. Which of the following is most general phase structured grammar?

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|-------------------------|-----------------------|
| (A) Context – Sensitive | (B) Regular           |
| (C) Context-Free        | (D) None of the above |

d. .... Language translator convert source program into object program or into machine language by taking one by one instruction.

- |               |                         |
|---------------|-------------------------|
| (A) Compiler  | (B) Interpreter         |
| (C) Assembler | (D) Language translator |

e. A \_\_\_\_\_ parser builds a parser tree by starting at the leaves and working up towards the root.

- |                       |                   |
|-----------------------|-------------------|
| (A) Bottom-up         | (B) Top-down      |
| (C) Recursive Descent | (D) None of these |

- f. This refers to the delay between the read/write request, and the appearance of the required sector under the read/write head.
- (A) Access Time (B) Seek Time  
(C) Latency Time (D) None
- g. Disadvantage of single level directory is .....
- (A) confusion of access methods  
(B) confusion of files data  
(C) confusion of file names between different users  
(D) none of the above
- h. \_\_\_\_\_ is called a light weight processes
- (A) Frames (B) Pages  
(B) Threads (D) None of the above
- i. .... is a binding performed before the execution of a program begins.
- (A) Dynamic binding (B) Object binding  
(C) Code binding (D) Static binding
- j. In ..... no search operations are conducted on them
- (A) Search Data structure (B) Linear Data structure  
(C) Non-linear Data structure (D) Allocation Data structure

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**PART A**

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

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- Q.2** Explain about the following in brief:
- (i) Batch operating systems  
(ii) Process Control Block (PCB)  
(iii) Multi programming  
(iv) Time sharing (4×4)
- Q.3** a. What is the difference between preemptive and non-preemptive scheduling?(8)
- b. State and explain the necessary conditions for deadlock to occur. (4)
- c. Summarise the features of the multiprogramming scheduler. (4)
- Q.4** a. Define critical section problem. Discuss about three requirements that a solution to critical-section problem must satisfy. (8)
- b. Discuss various allocation methods used in the file system. (8)

- Q.5** a. Differentiate between  
 (i) Paging and segmentation  
 (ii) Internal and External Fragmentation. (8)
- b. Consider the following reference string  
 5, 4, 3, 2, 1, 4, 3, 5, 4, 3, 2, 1, 5  
 Show the behaviour of FIFO page replacement policy considering  
 (i) 3 page frame (alloc = 3)  
 (ii) 4 page frame (alloc = 4) (8)

**PART B**

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

- Q.6** a. What do you mean by Intermediate Representation (IR)? What are the desirable properties of an IR? (4)
- b. Differentiate between program translation and program interpretation model. Give appropriate schematic to explain. (6)
- c. What is language processor? Define briefly various categories of language processor. (6)
- Q.7** a. Write a note on LL(1) parser. Make a parser table for an LL(1) parser for the following grammar:  
 $E ::= TE'$   
 $E' ::= +TE' | \epsilon$   
 $T ::= VT'$   
 $T' ::= *VT' | \epsilon$   
 $V ::= <id>$  (10)
- b. Explain the similarities and differences between the use of macros and the use of subroutines. (6)
- Q.8** a. What are advantages of assembly language? (4)
- b. Discuss various categories of assembly language statement. Give examples in each category. (6)
- c. What are the tasks performed by synthesis phase of an assembler. List these. (6)
- Q.9** a. What do you understand by the parameter passing mechanism? Give brief description about  
 (i) Call by value  
 (ii) Call by value-result  
 (iii) Call by reference (8)
- b. Differentiate between  
 (i) Compiler and interpreter  
 (ii) Pure and impure interpreter. (8)