

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?

- (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
(C) 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

PART A

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

- 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:
 $E ::= TE'$
 $E' ::= +TE' \mid \epsilon$
 $T ::= VT'$
 $T' ::= *VT' \mid \epsilon$
 $V ::= <id>$ (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)