

DipIETE – CS (OLD SCHEME)

Code: DC14
Time: 3 Hours

Subject: SYSTEM SOFTWARE & OPERATING SYSTEMS

Max. Marks: 100

JUNE 2011

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. Each question carries 16 marks.
 - Any required data not explicitly given, may be suitably assumed and stated.
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Q.1 Choose the correct or the best alternative in the following: **(2×10)**

a. A program in the state of execution is called _____

- | | |
|---------------|-----------------|
| (A) Process | (B) Instruction |
| (C) Procedure | (D) Function |

b. Memory utilization factor shall be computed as follows:

- (A) Memory in use/allocated memory.
- (B) Memory in use/total memory connected.
- (C) Memory allocated/free existing memory.
- (D) Memory committed/total memory available.

c. An assembler is

- (A) programming language dependent.
- (B) syntax dependant.
- (C) machine dependant.
- (D) data dependant

d. Nested Macro calls are expanded using the

- (A) FIFO rule (First in first out) (B) LIFO (Last in First out)
- (C) FILO rule (First in last out) (D) None of the above

e. A linker program

- (A) places the program in the memory for the purpose of execution.
- (B) relocates the program to execute from the specific memory area allocated to it.
- (C) links the program with other programs needed for its execution.
- (D) interfaces the program with the entities generating its input data

- f. A UNIX device driver is _____
- (A) Structured into two halves called top half and bottom half
 (B) Three equal partitions
 (C) Unstructured
 (D) None of the above
- g. Number of jobs done in specified time period is called_____
- (A) Throughput (B) Turnaround time.
 (C) Dispatch (D) Scheduler.
- h. Breaking of program into its logical segments is known as _____
- (A) Fragmentation. (B) Segmentation.
 (C) Physical address. (D) Logical address.
- i. SSTF stands for_____
- (A) Shortest-Seek-time-first scheduling
 (B) small - small-time-first
 (C) simple-seek-time-first
 (D) small-simple-time-first scheduling
- j. Translator for low level programming language were termed as _____
- (A) Assembler (B) Compiler
 (C) Linker (D) Loader

**Answer any FIVE Questions out of EIGHT Questions.
 Each question carries 16 marks.**

- Q.2** a. What is parsing? Write down the drawback of top down parsing of backtracking. (5)
- b. Describe the four step approach to develop a design specification for an assembler. (11)
- Q.3** a. What are the four necessary conditions of deadlock prevention? (4)
- b. What are threads? Why are they required? (3)
- c. Describe the steps in a non-blocking protocol. (9)

- Q.4** a. Explain about the Search data structure in brief. (4)
- b. What is a race condition? Explain how does a critical section avoid this condition. (6)
- c. Distinguish between Pure and Impure Interpreters. (6)
- Q.5** a. List the steps needed to perform page replacement. (4)
- b. Explain about different techniques with which a file can be shared among different users. (8)
- c. What are the fundamental steps in program development? Explain about program testing and debugging in brief. (4)
- Q.6** a. Draw the state diagram of a process from its creation to termination, including all transitions, and briefly elaborate **every state** and **every transition**. (8)
- b. What is response ratio? (2)
- c. Describe the three major issues in code generation for expressions. (6)
- Q.7** a. Explain the differences between macros and subroutines. (5)
- b. Write short notes on the following: (8)
- (i) YACC. (ii) Debug monitors.
- c. Define 3 events concerning resource allocations. (3)
- Q.8** a. Define an operating system. (2)
- b. What are the 3 aspects of a message delivery protocol? What are blocking & non-blocking protocols? (7)
- c. Define an IO Buffer. How is it achieved? (7)
- Q.9** a. What are the advantages of code optimization? Explain optimizing transformations. (7)
- b. Describe (3)
- (i) Problem-oriented and procedure-oriented language (3)
- (ii) Encryption of data (3)
- (iii) Three techniques for protection of user files (3)