

Code: AC59/AT59 Subject: OPERATING SYSTEMS & SYSTEMS SOFTWARE  
AMIETE – CS/IT (NEW SCHEME)

Time: 3 Hours

**JUNE 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. A scheduler which selects processes from secondary storage device is called

- (A) Short term scheduler (B) Process scheduler  
(C) Medium term scheduler (D) Long term scheduler

b. LRU stands for

- (A) Last Recently User (B) Least Replaced Unit  
(C) Last Restored Used (D) Least Recently Used

c. Locality of reference implies that the page reference being made by a process

- (A) will always be to the page used in the previous page reference.  
(B) is likely to be the one of the pages used in the last few page references.  
(C) will always be to one of the pages existing in memory.  
(D) None of these.

d. Banker's Algorithm is a

- (A) Deadlock Creation algorithm (B) Deadlock Detection algorithm  
(C) Deadlock Resolution algorithm (D) Deadlock Avoidance algorithm

e. In \_\_\_\_\_, a programmer identifies the logical entities in his program and declares them as program components for the purpose of virtual memory implementation.

- (A) Segmentation (B) Paging  
(C) Thrashing (D) Fragmentation

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- f. Descriptor is also known as
- (A) Data (B) Token  
(C) Parser (D) String
- g. JCB stands for
- (A) Job Cache Block (B) Job Control Box  
(C) Job Control Block (D) Join Circuit Board
- h. The process of merging many object modules to form a single machine language program is known as
- (A) Translating (B) Linking  
(C) Interpreting (D) Loading
- i. Analysis which determines the meaning of a statement once its grammatical structure becomes known is termed as
- (A) Semantic analysis (B) Syntax analysis  
(C) Code analysis (D) Translation analysis
- j. Which of the following can be used as criteria for classification of data structures used in language processing?
- (A) nature of a data structure (B) purpose of data structure  
(C) lifetime of data structure (D) all of the above

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

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- Q.2** a. What is Process Control Block? Explain the various component of Process Control Block. (8)
- b. Distinguish between Multiprogramming and Multiprocessing Systems. (4)
- c. Discuss the differences between user level threads and kernel level threads. (4)
- Q.3** a. List the action taken by event handler when process  $p_i$  makes an IO request. (4)
- b. State different scheduling criteria that must be kept in mind while choosing different scheduling algorithms. (4)
- c. Discuss the four necessary conditions of deadlock prevention. (8)
- Q.4** a. What is critical-section problem? Give a solution for reader-writers problem using conditional critical regions. (8)

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- b. Discuss the various attributes of a file. What are the methods that help accessing the information stored in a file? Discuss them. (8)

**Q.5** a. Discuss the two approaches used to identify and reuse free memory areas in a heap. (8)

- b. Consider the following segment table:

Segment	Base	Length
0	219	600
1	2300	14
2	90	100
3	1327	580
4	1952	96

What are the physical addresses for the following logical addresses?

- (i) 0,430 (ii) 1,10  
(iii) 2,500 (iv) 3,400  
(v) 4,112 (8)

### PART B

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

**Q.6** a. Differentiate between program translation and program interpretation. (5)

- b. What is Binding and Binding Time? Specify the binding times for the various entities of the given program segment. (5)

program bindings (input, output);

var

i : integer;

a,b : real;

procedure proc (x : real; j : integer);

var

info : array [1..10, 1..5] of integer;

p : ↑integer;

begin

new(p);

end;

begin

proc(a,i);

end.

- c. Discuss the collision handling methods. (6)

**Q.7** a. Define top down parsing. Discuss the features that are needed to implement top down parsing. Also, give an algorithm for Operator Precedence Parsing. (2+4+4)

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- b. Define the term Macro Definition, Macro call and Macro Expansion. Explain the differences between macros and subroutines. (6)

**Q.8** a. What is Assembly language? What are the kinds of statements used in Assemble Language Program? Give advantages and disadvantages of assembly language. (8)

- b. Discuss the registers set and Control transfer instructions of Intel 8088. (8)

**Q.9** Discuss the following:

- (i) Static and Dynamic memory allocation (4)
- (ii) Call by value and Call by reference (3)
- (iii) Triples and Quadruples (3)
- (iv) Local and Global optimization (3)
- (v) Pure and Impure interpreter (3)