

Time: 3 Hours

JUNE 2013

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. _____ is the activity of determining which service request should be handled next by a server.
- (A) Scheduling
(B) Scanning
(C) Forwarding
(D) Requesting
- b. A _____ feature is needed to ensure that the user job does not corrupt the batch monitor code.
- (A) Memory security
(B) Memory protection
(C) Memory Synchronization
(D) Memory segmentation
- c. Full form of RRAG
- (A) Resource Round and Allocated Graph
(B) Round Robin Allocated Graph
(C) Resource Request and Allocation Graph
(D) None of these
- d. A _____ is used to speed up address translation.
- (A) Dynamic Address translation
(B) Translation look-aside buffer
(C) Paging
(D) Demand-Paging

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- e. The “blocking factor” of a file is
- (A) the number of blocks accessible to a file
 - (B) the number of blocks allocated to a file
 - (C) the number of logical records in one physical record
 - (D) none of these
- f. A _____ of a program entity is a reference to the entity which precedes its definition in the program.
- (A) Generation
 - (B) Forward reference
 - (C) Phase
 - (D) Analysis
- g. _____ is the association of an attribute of a program entity with a value.
- (A) Identifier
 - (B) Associativity
 - (C) Binding
 - (D) Compilation
- h. Name the translator that performs some preliminary processing of the source program to reduce the analysis overheads during interpretation.
- (A) Pre-processor
 - (B) Linker
 - (C) Loader
 - (D) Impure interpreter
- i. Address of the origin assigned by the linker while producing a binary program is _____.
- (A) Translated origin
 - (B) Linked origin
 - (C) Relocated origin
 - (D) Self-relocated origin
- j. The _____ is executed when the computer is turned on or restarted.
- (A) Cross-Compiler loader
 - (B) Relating loader
 - (C) Boot Strap loader
 - (D) Compile and go loader

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

- Q.2** a. What is operating system? Discuss the various features of operating system? (8)
- b. Explain the following facilities for implementing interacting processes in programming languages and Operating systems:
- (i) Fork-Join primitives
 - (ii) Unix processes (4x2)
- Q.3** a. Explain Event Control Block (ECB)? With the help of suitable diagram discuss the organization of the different modules of event handler. (8)

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- b. Write down Banker's algorithm for multiple resources? List different Input and Data structures used in the algorithm. (8)

- Q.4** a. What is a semaphore? Explain binary semaphore with the help of an example. (4)
- b. What is Critical-Section problem? What are the requirements that critical-section problem must satisfy for its solution? (6)
- c. Discuss the different techniques with which a file can be shared among different users? (6)
- Q.5** a. With the help of example, discuss overlay? (6)
- b. Consider a paging system with the page table stored in memory
- (i) If a memory reference takes 200 nanoseconds, how long does a paged reference take?
- (ii) If we add associative registers, and 75 percent of all page-table references are found in the associative registers, what is the effective memory reference time? (Assume that finding a page-table entry in the associative registers takes zero time, if the entry is there.) (3+3)
- c. What is the cause of thrashing? How does the system detect thrashing? (4)

PART B

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

- Q.6** a. Define Intermediate Representation? What are the desirable properties of Intermediate Representation? (2+2)
- b. Define Grammar of a language. Identify the different classes of grammar. Explain their characteristics and limitations. (6)
- c. Discuss the different criteria used to classify the data structures used for Language processors? (6)
- Q.7** a. What is parsing? Give difference between top down parsing and bottom up parsing. (5)
- b. What are self-relocating programs? Why self-relocating programs are less efficient than relocatable programs? (7)
- c. The translated origin of the assembly program P is 500. If the program is loaded for execution in the memory area starting with the address 900, calculate the relocation factor of P. (4)

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- Q.8** a. What is assembly language? What are the basic features provided by assembly language that simplifies programming as compared to machine language? (1+3)
- b. Explain the following Assembler Directives:-
- (i) ORIGIN
 - (ii) EQU
 - (iii) LTORG
 - (iv) START & END (3x4)

- Q.9** a. Consider the following program segment:

```
main()
{
int i, j;
float x, y;
    y = 10; .....(A)
    i = 5;
    x = y + i; .....(B)
}
```

Explain what action the compiler must take during the compilation of assignment statements marked as (A) and (B)? (6)

- b. What are the features used by compiler during implementing function calls?(5)
- c. Give an account of the issue pertaining to compilation of “if” statement in C language? (5)