ROLL NO. _____

Code: AC59/AT59/AC110/AT110
Subject: OPERATING SYSTEMS & SYSTEMS SOFTWARE

AMIETE – CS/IT (Current & New Scheme)

Time: 3 Hours **DECEMBER 2018** **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. Process is

(A) Program in High level language kept on disk
(B) Contents of main memory
(C) A program in execution
(D) A job in secondary memory

b. Translator for low level programming language were termed as

(A) Assembler **(B)** Compiler
(C) Linker **(D)** Loader

c. Load address for the first word of the program is called

(A) Linker address origin **(B)** Load address origin
(C) Phase library **(D)** Absolute library

d. The translator which performs macro expansion is called a

(A) Macro processor **(B)** Macro pre-processor
(C) Micro pre-processor **(D)** Assembler

e. Shell is the exclusive feature of

(A) UNIX **(B)** DOS
(C) System software **(D)** Application software

f. When the process issues an I/O request:

(A) It is placed in an I/O queue **(B)** It is placed in a waiting queue
(C) It is placed in the ready queue **(D)** It is placed in the job queue.

g. An assembler is

(A) Programming language dependent **(B)** Syntax dependent
(C) Machine dependent **(D)** Data dependent

h. The operating system is an example of a computer
(A) Object **(B)** File system
(C) Program **(D)** Desktop

i. Most operating systems are comprised of three main components: the ____ the file system, and the shell.
(A) Desktop **(B)** Kernel
(C) User interface **(D)** Code

j. The_____ keeps track of directories and files.
(A) Kernel **(B)** File system
(C) Shell **(D)** User interface

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

Q.2 a. What is the relationship between operating systems and computer hardware? What are the differences between Batch processing system and Real Time Processing System? **(4+4)**

b. What are the differences between multiprocessing and multiprogramming? What are the differences between Real Time System and Timesharing System? **(4+4)**

Q.3 a. What is a process scheduler? State the characteristics of a good process scheduler? **(4)**

b. Explain time slicing. How its duration affects the overall working of the system. What is Shortest Remaining Time, SRT scheduling? **(4)**

c. What are the four conditions required for deadlock to occur? Describe four general strategies for dealing with deadlocks. **(4+4)**

Q.4 a. What are the differences between paging and segmentation? Explain various allocation algorithms. **(4+4)**

b. When does a page fault occur? Explain various page replacement strategies/algorithms. **(4+4)**

Q.5 a. What is a race condition? Give an example. **(2+1)**

b. What is a critical region? How do they relate to controlling access to shared resources? **(2+2)**

c. What are three requirements of any solution to the critical sections problem? Why are the requirements needed? **(3+3)**

d. What is the producer consumer problem? Give an example of its occurrence in operating systems. **(2+1)**

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

Q.6 a. What are language processing activities? Describe Fundamentals of Language Processing and fundamentals of language specification. **(4+4)**

b. On what criteria data structure web in language processing can be classified. Write an algorithm also for generic search procedure. Write a short note on hashing function. **(3+3+2)**

Q.7 a. Explain scanning and parsing. Explain semantic analysis and the different notations used in grammar. Explain the Recursive Descent techniques for parsing. **(2+2+4)**

b. Write a note on Complier Development Tools. Write a note on interpreter and design of linker. What is static linking and dynamic linking? **(2+2+4)**

Q.8 a. What is assembly language? Explain the three basic facilities of assembly language. Write a short note on design of assembler. **(2+3+2)**

b. Discuss the architecture of Intel 8088 microprocessors. **(4)**

c. What is pass structure of assemblers? Explain design of a two pass assembler. **(2+3)**

Q.9 a. Write note on Compilation of Expressions and Compilation of Control Structures. **(4)**

b. Discuss the aspects of Compilation. **(4)**

c. Discuss in brief the code optimization techniques. **(4)**

d. What are various Memory Allocation Techniques? **(4)**