Bengal Engineering and Science University

Department of E&T.C.

6th Semester ⟨E&T.C⟩

Sub: System Software (ET-603)   FM: 70

Time: 3 hours.

Answer all questions in a single answer script.

Answer any six questions taking three from each half. Two marks from each half are reserved for neatness and to the point answer.

First Half

1. a) "Time sharing system is better than PC or a single user work station." - Explain and justify, whether the statement is true or false.   (6)

b) What are the main differences between operating systems for mainframe computer and personal computers.   (5)

2. a) Explain, with examples how system calls are used in operating system.   (5)

   (b) How many types of system calls are there? Explain each of them briefly   (6)

3. a) What is the purpose of interrupts?   Explain with necessary example.   (4)

   b) Explain the function of virtual machine with necessary diagram and example.   (5)

   c) Explain para virtualization.   (2)

4. a) How could a system be designed to allow a choice of operating systems from which to boot? What would be bootstrap program need to do?   (4)

   b) What is process? Discuss the differences between process and program.   (4)

   c) Describe the action taken by a kernel to context-switch between processes.   (3)

5. Write short note on:

   a) Pipes   (5)

   b) Inter process communication   (6)

Second Half

6. a)   What the difference between a complier and an interpreter?   (2)

(b) What are the advantages of a (i) complier over an interpreter. (ii) an interpreter over a complier. (3)

(c) Explain the differences in how much the following scheduling algorithms discriminate in favour of short processes.

(i) First come first serve.

(ii) Round Robin.

(iii) Multi level feedback queue. (6)

7. a) Define grammar. How many types of grammars are there? Explain each of them briefly. (5)

(b) Why is it important for the scheduler to distinguish I/O bound programs from CPU bound programs? (3)

(c) What advantage is there in having different time-quantum sizes at different levels of a multi level queuing system? (3)

8. a) Consider the following grammar.

$$S \longrightarrow SS+ \mid SS^* \mid a$$

i) What type of grammar is described by the above relations. Justify.

ii) Show how the string aa+a* can be generated by the grammar.

iii) Construct a parse tree for this string.

iv) What language does this grammar generate? Justify your answer. (8)

b) What do you mean by ambiguous grammar. (3)

9. a) What do you mean by parsing? (2)

b) What is the function of lexical analyzer in a complier. (4)

c) Explain why interrupts are not appropriate for implementing synchronization primitives in multi processer systems. (5)

10. Write short notes on : ((i) or (ii) and (iii) or (iv))

i) Critical section problem (6)

ii) Syntax tree (6)

iii) Regular expression (5)

iv) Semaphore (5)