

**AMIETE – CS/IT (Current & New Scheme)**

Time: 3 Hours

**December 2016**

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)**

- In which type of Operating System the response time is critical?  
(A) Batch Operating System      (B) Unix Operating System  
(C) Real Time Operating System      (D) Network Operating System
- Which scheduler selects the processes to be brought into the Ready Queue?  
(A) Long Term Scheduler      (B) Mid Term Scheduler  
(C) Short Term Scheduler      (D) Real Term Scheduler
- Fork is:  
(A) The dispatching of a task      (B) The creation of a new job  
(C) The creation of a new process      (D) Increasing the priority of a task
- The address of the next instruction to be executed by the current process is provided by the  
(A) CPU registers      (B) Program counter  
(C) Process stack      (D) Pipe
- To differentiate the many network services, a system support \_\_\_\_\_ are used.  
(A) Variables      (B) Sockets  
(C) Ports      (D) Service names
- Which module gives control of the CPU to the process selected by the short-term scheduler?  
(A) Queue      (B) Interrupt  
(C) Scheduler      (D) Dispatcher
- Which of the following system software resides in main memory always?  
(A) Text Editor      (B) Assembler  
(C) Linker      (D) Loader

- h. In a time-sharing operating system, when the time slot given to a process is completed, the process goes from the running state to the:
- (A) Blocked state (B) Ready state  
(C) Suspended state (D) Terminated state
- i. Which of the following statement(s) are true?
- I. Shortest remaining time first scheduling may cause starvation  
II. Preemptive scheduling may cause starvation  
III. Round robin is better than FCFS in terms of response time
- (A) I only (B) I and III only  
(C) II and III only (D) I, II and III
- j. In a two pass assembler the object code generation is done during the:
- (A) Zeroth Pass (B) First Pass  
(C) Second Pass (D) Not done by assembler

**PART A**

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

- Q.2** a. Consider the following set of processes with their arrival times and burst time in minutes. (10)

Process ID	Arrival Time	Burst Cycle Time
1	0	5
2	1	15
3	3	12
4	7	25
5	10	5

Calculate the average for the following:

	Turn-around time	Waiting time	Throughput
<b>FCFS</b>			
<b>SJN</b>			
<b>Round Robin</b>			

- b. Describe the differences between symmetric and asymmetric multiprocessing. What are three advantages and one disadvantage of multiprocessor systems? (6)

- Q.3** a. What do you mean by the terms graceful degradation, context switch and bootstrap loader? (6)

- b. Describe the differences among short-term, medium-term, and long term scheduling. What do you mean by I/O bound and CPU bound processes? Which impact do they have on the system utilization? (10)

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- Q.4** a. Explain Bankers' algorithm for deadlock avoidance in detail. (6)
- b. Explain the difference between multilevel queue scheduling and multilevel feedback-queue scheduling. (6)
- c. What is MBR? Explain with figure the file system implementation of computer system boot-up. (4)
- Q.5** a. What is address binding? Explain the difference between internal and external fragmentation and their solution. (6)
- b. Define Segmentation and Thrashing. (4)
- c. Explain with diagram virtual memory implementation using segmentation. (6)

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

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- Q.6** a. Discuss the design of one pass assembler in detail. (10)
- b. Compare one pass assembler with multipass assembler. (6)
- Q.7** a. Explain dynamic linking in detail. (8)
- b. Compare linking loader and linkage editor. (8)
- Q.8** a. What are the phases and passes of a language processor? (6)
- b. Explain in detail any two allocation data structures. (10)
- Q.9** a. What is the difference between static and dynamic memory allocation? (8)
- b. Explain in detail various parameter passing mechanisms with suitable examples. (8)