

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY
MCA - SEMESTER– III• EXAMINATION – WINTER 2017

Subject Code:3630003

Date:02/01/2018

Subject Name: Basic Computer Science – 2

Time:10.30 AM TO 01.00PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1**
- | | | |
|-----|---|----|
| (a) | i) Define Process State. | 02 |
| | ii) What is User-visible registers? | 01 |
| | iii) Define Interrupts. | 01 |
| | iv) Define five major achievements for developing OS. | 02 |
| | v) Define memory fault. | 01 |
- (b)
- | | | |
|------|--|----|
| i) | Differentiate between “asleep in memory” and “sleep, swapped” state in UNIX process state diagram. | 02 |
| ii) | What is “fork()” function in UNIX process management? | 02 |
| iii) | Differentiate between “Fixed partition” and “Dynamic partition” term used in OS. | 03 |
- Q.2**
- | | | |
|-----|---|----|
| (a) | i) Explain principles of concurrency with the help of suitable example. | 05 |
| | ii) Define compaction. | 02 |
- (b)
- | | | |
|-----|--|----|
| i) | List down the conditions for Deadlock. | 03 |
| ii) | Define semaphore with its’ three operations. Define also binary semaphore. | 04 |
- OR**
- (b)
- | | | |
|-----|---|----|
| i) | Define below mentioned terms: Mutual Exclusion and Starvation | 05 |
| ii) | Define “thrashing”. | 02 |
- Q.3**
- | | | |
|-----|---|----|
| (a) | i) What is the difference between Round Robin scheduling and Feedback scheduling. | 03 |
| | ii) What are the difference between preemptive and non-preemptive uni-processor scheduling. Which scheduling are under non-preemptive and which are under preemptive? | 04 |
- (b)
- | | | |
|-----|---|----|
| i) | Define “virtual memory”. Explain “Fetch policy” in memory management. | 05 |
| ii) | When will internal and external fragmentation be occurred? | 02 |
- OR**
- Q.3**
- | | | |
|-----|---|----|
| (a) | i) Explain user-level thread and kernel-level thread. | 05 |
| | ii) Differentiate between ready state and block state of a process. | 02 |
- (b)
- | | | |
|-----|---|----|
| i) | Explain Dining philosophers’ algorithm for freeing deadlock and starvation. | 05 |
| ii) | Define page and page frame. | 02 |
- Q.4**
- | | | |
|-----|--|----|
| (a) | i) Differentiate between the following: | 04 |
| | a. Literal vs Declare Constant | |
| | b. Scanning vs Parsing | |
| | ii) Construct the Operator Precedence Parser for the string: $a + b + c + d$. | 03 |
- (b)
- | | | |
|---|--|----|
| What do you understand by Triple and Quadruple forms for expressions? | | 07 |
| Explain with appropriate example. | | |
- OR**
- Q.4**
- | | | |
|--|---|----|
| (a) | i) List the various Assembly statements. Explain Declarative statements in details. | 04 |
| | ii) Define the following: | 03 |
| Language processor, Compiler, Abstract Syntax Tree | | |

- (b) Write a brief account on Code Optimization. **07**
- Q.5** (a) Answer any two of the following: **10**
- i) Write a brief account in Front end of the compiler.
 - ii) Write a note on Dynamic memory allocation in terms of Program controlled and Automatic allocation.
 - iii) Explain the various Assembler Directives.
- (b) Write notes on any two of the following: **04**
- i) Scope rules
 - ii) Top-down parsing
 - iii) Activation Record Base
- OR**
- Q.5** (a) Explain in detail – The back end of a toy compiler with an appropriate example **07**
- (b) (1) Write a short note on classification of grammar **04**
- (2) Regular expression **03**
