Seat No.: _____ Enrolment No._____

GUJARAT TECHNOLOGICAL UNIVERSITY

MCA - SEMESTER– III EXAMINATION – WINTER 2018

Subject Code: 3630003 Date: 07-01-2019

Subject Name: Basic Computer Science-2

Time: 10.30 am to 1.00 pm 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)** Define the following terms: **07**

1. Multiprocessing
2. Trashing
3. Response time
4. Turn-around time
5. Critical Section
6. Monitor
7. Safe state

(b) What is a Process? Explain the five state Process model with neat diagram **07**

Q.2 **(a)** (i) What is an Operating System? Give the functions of Operating System. **04**

(ii) What are threads? Explain the types of threads. **03**

(b) Explain the IPC problem: Dining Philosopher's Problem. **07**

OR

(b) What is a Semaphore? Write the algorithm to implement Producers-Consumers problem using semaphore. **07**

Q.3 **(a)** What is fragmentation? What is the need of fragmentation? Explain the difference between internal and external fragmentation. **07**

(b) What is deadlock? List the conditions that lead to deadlock. How can be deadlock prevented? **07**

OR

Q.3 **(a)** What is a scheduler? Explain Long term, Medium term and Short term scheduler in detail. **07**

(b) Explain the concept of Paging with example. **07**

Q.4 **(a)** Define the following terms and provide examples: **07**

1. Scanning
2. Regular expression
3. Parsing

(b) Discuss the front end of a toy compiler. Support your answer with an appropriate example. **07**

OR

Q.4 **(a)** (i) Explain classification of Grammar **04**

(ii) Differentiate between Top down parsing and Bottom-up parsing **03**

(b) Discuss the back end of a toy compiler. Support your answer with an appropriate example. **07**

Q.5 **(a)** What do you understand by code optimization? List the various code optimization techniques. Explain any three of them. **07**

(b) What is an assembler? Give the details regarding the data structure generated at the end of pass 1 of the assembler. Discuss the need of each table in details. **07**

Q.5 **(a)** What are the different types assembly statements? Giving syntax explain all the assembler directive statements in details. **07**

(b) Discuss compilation of expressions using quadruple form. Also support your answer with proper example. **07**

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