Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

SEMESTER B.TECH. (COMPUTER SCIENCE AND ENGINEERING)

END SEMESTER EXAMINATIONS, APRIL 2018

ESSENTIALS OF IT (OPEN ELECTIVE) [CSE 3282]

REVISED CREDIT SYSTEM

(30 /04/2018)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

- Answer **ALL** the questions.
- Missing data if any may be suitably assumed.

1A. What are buses? How can the buses be classified? Explain each class. **3M**

1B. How does variable partition memory management overcome the limitations of fixed partition memory management? Illustrate with an example. **4M**

1C. Apply LRU and FIFO page replacement algorithms for the following page references. Use 3 frames per page. Find the number of page faults and page hits in both the cases. **3M**

3 1 3 4 2 4 1 2 3 1 2 4 2 3 1 3

2A. Explain the following: **3M**

i. Semaphores ii. Critical section iii. Deadlock

2B. Explain Harvard and Von-Neumann computer architectures with neat block diagrams and also mention their differences. **4M**

2C. Explain the volume-structure of the disk in MS-DOS and mention the functions of each field. **3M**

3A. Draw the process state transition diagram and explain each state in it. **3M**

3B. Compare and contrast multi-programming and multi-processing. **2M**

3C. **i.** Write Gantt chart and calculate the individual process waiting time and average waiting time using **priority based preemptive scheduling** for the data given in Table-3C. Assume priority 0 > priority 1. In case of any tie, use FCFS. **5M**

Table - 3C

Process	Estimated run time (in milliseconds)	Arrival time	Priority
P1	12	0	2
P2	10	0	1
P3	4	1	0
P4	10	4	2
P5	12	2	1

ii. What are sub-queries?

Given a relation Item (ItemID, ItemName, UnitPrice, Class), write sub-queries for the following.

a) List the details of the items whose unit price is maximum
b) List the second highest unit price from the Item relation.

4A. Describe the three level architecture for DBMS with neat diagram. **3M**

4B. Explain the following keys in a relational model with suitable examples. **3M**

i. Candidate key
ii. Primary key
iii. Foreign key

4C. Devise an ER Model for the following statements: **4M**

A university has many departments.
Each department has multiple instructors; one among them is the head of the department.
An instructor belongs to only one department.
Each department offers multiple courses, each of which is taught by a single instructor.
A student may enroll for many courses offered by different departments.

5A. Explain the following SQL commands with an example each: **3M**

i. ALTER
ii. SELECT with Group by and Having clause
iii. DELETE

5B. Why do you normalize databases? Explain first three normalization forms with suitable examples. **3M**

5C. i. Compare the following data types in SQL: **4M**

a) Char and Varchar2 b) Number and Long

ii. Explain DCL statements with their syntax and examples.