



**P.E.S. College of Engineering, Mandya - 571 401**  
 (An Autonomous Institution affiliated to VTU, Belagavi)  
**Sixth Semester, B.E - Electronics and Communication Engineering**  
**Semester End Examination; August - 2023**  
**Introduction to Basics of Information Technology**

Time: 3 hrs

Max. Marks: 100

**Course Outcomes**

The Students will be able to:

CO1: Will be able to formulate computer arithmetic and understand the performance requirements of systems

CO2: Will understand the functions and objectives of operating system

CO3: Will be able to identify the problems related to task synchronization and deadlock

CO4: Will use appropriate data structures like arrays, linked list, stacks and queues to solve real world problems efficiently.

CO5: Will be able to represent and manipulate data using nonlinear data structures like trees to design algorithms for various applications

**Note:** I) PART - A is compulsory. Two marks for each question.

II) PART - B: Answer any **Two** sub questions (from a, b, c) for a Maximum of **18 marks** from each unit.

Q. No.	Questions	Marks	BLs	COs	POs
<b>I : PART - A</b>		<b>10</b>			
1 a.	Give the carry equations C1, C2, C3, C4 for a 4-bit carry lookahead adder.	2	L1	CO1	PO1
b.	Give any four reasons for process termination.	2	L1	CO2	PO1
c.	What are the three operations performed on semaphores?	2	L1	CO3	PO1
d.	What is a Queue?	2	L1	CO4	PO1
e.	What is Leaf? Define Binary tree.	2	L1	CO5	PO1
<b>II : PART - B</b>		<b>90</b>			
<b>UNIT - I</b>		<b>18</b>			
2 a.	Explain the working of a 4-bit carry-lookahead adder.	9	L3	CO1	PO1
b.	Illustrate and explain the Binary addition/subtraction logic circuit.	9	L2	CO1	PO1
c.	Multiply 01101×1010 (Hint +13×-6) using, i) Booth algorithm      ii) Bit-Pair recoding of multipliers	9	L3	CO1	PO2
<b>UNIT - II</b>		<b>18</b>			
3 a.	List the service provided by OS. Explain any two of them.	9	L2	CO2	PO1
b.	Illustrate and explain five-state process model.	9	L2	CO2	PO1
c.	Illustrate and explain the elements in a Process Control Block.	9	L2	CO2	PO1
<b>UNIT - III</b>		<b>18</b>			
4 a.	Explain the conditions for deadlock and how it can be prevented.	9	L2	CO3	PO2
b.	Explain the dining philosopher's problem.	9	L2	CO3	PO1
c.	Explain the three placement algorithms with suitable illustrations.	9	L2	CO3	PO1

**UNIT - IV****18**

- 5 a. What are the basic structures used to implement an ADT? Explain in detail. 9 L2 CO4 PO3
- b. Illustrate and explain the three basic stack operations. 9 L2 CO4 PO2
- c. Illustrate and define the following basic queue operations: 9 L2 CO4 PO2
- i) Dequeue                      ii) Queue front

**UNIT - V****18**

- 6 a. Define a tree and explain the terminologies used with illustrations. 9 L2 CO5 PO1
- b. Write algorithms for finding largest node and smallest node using BST. 9 L2 CO5 PO2
- c. Analyze and write the algorithm for sequential circuits. 9 L2 CO5 PO2

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