BACHELOR OF TECHNOLOGY (CBCS - 2023)
B. Tech. Sem-II Computer Science & Business Systems : SUMMER : 2025
SUBJECT: DATA STRUCTURES & ALGORITHMS

Day : Wednesday
Date : 28/05/2025

S-27709-2025

Time : 10:00 AM-01:00 PM
Max. Marks : 60

N.B.

1) All questions are **COMPULSORY.**
2) Figures to the right indicate **FULL** marks.
3) Use of non-programmable calculator is allowed.
4) Assume suitable data if necessary.

Q.1 Define algorithm. Discuss the key characteristics of algorithms. **(10)**

OR

Define recurrence relation. Discuss substitution technique with example.

Q.2 Define linked list. Write the basic operations that can be performed on linked list. **(10)**

OR

Differentiate between stack and queue.

Q.3 Define B tree. Discuss that various cases of deletion of element from the B Tree with example. **(10)**

OR

Create a B+ tree of the Order 4 for the given elements 1, 4, 7, 10, 17, 21, 31, 25, 19, 20, 28, 42.

Q.4 Define Minimum Spanning tree and discuss Minimum Spanning tree algorithms. **(10)**

OR

Discuss directed and undirected graph with examples.

Q.5 Discuss quick sort algorithm and sort the following elements using quick sort. (10, 80, 30, 90, 40, 50, 70) **(10)**

OR

What is a Heap? Discuss working of heap sort algorithm examples with time complexity.

Q.6 Explain the concept of hashing and how it can be used for used for fast key-based access in hashed file organization. **(10)**

OR

Discuss the challenges and limitations of existing file organization methods?

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BACHELOR OF TECHNOLOGY (CBCS - 2023)

B. Tech. Sem-II Computer Science & Business Systems : SUMMER : 2025

SUBJECT: PRINCIPLES OF ELECTRONICS ENGINEERING

Day : Friday
Date : 30/05/2025

S-27710-2025

Time : 10:00 AM-01:00 PM
Max. Marks : 60

N.B.:

1) All questions are **COMPULSORY**.
2) Figures to the right indicate **FULL** marks.
3) Draw neat diagrams **WHEREVER** necessary.
4) Assume suitable data, if necessary.

Q. 1	Explain conductor, semiconductor and insulator with the help of Energy band diagram.	(10)
	OR	
Q. 1	Describe the drift current and diffusion current with the help of diagram in detail.	(10)
Q.2	With a neat sketch explain the working of i) Centre – tap full – wave rectifier ii) full – wave bridge rectifier	(10)
	OR	
Q. 2	Sketch the V – I characteristics of P – N junction diode. Describe Zener breakdown and Avalanche Breakdown in detail.	(10)
Q. 3	Define the current amplification factor for common emitter configuration, common base configuration, and common collector configuration. Derive the relation between them.	(10)
	OR	
Q. 3	Describe the need of basing circuits in Transistor. Explain the operation of fixed bias circuit with input and output equations and state advantages and disadvantages of same circuit.	(10)
Q. 4	Draw and explain operation of n – channel depletion type MOSFET with Drain and Transfer characteristic graph.	(10)
	OR	
Q. 4	Explain common source and common gate configuration of MOSFET with circuit diagram	(10)
Q. 5	Explain the inverting and non – inverting mode of operation. Write a short note on voltage follower in Op – Amp.	(10)
	OR	
Q. 5	What is mean by feedback? Explain Inverting and Non – Inverting amplifier with diagram.	(10)
Q. 6	i) Reduce the expression using K – map. $F(A,B,C,D) = \Sigma m(0,1,3,4,5,6,7,13,15)$ ii) Explain Half adder and Half subtractor.	(10)
	OR	
Q. 6	Which gates are called universal gates and why? Explain DeMorgans first and second theorem with truth table and logic diagram.	(10)

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