End Semester Examination Pattern:

Maximum Marks: 50			
Verification of Daily program record and Git Repository			5 marks
Viva			10 marks
Problem solving (Based on difficulty level, one or more questions may be given)	Flowchart / Algorithm / Structured description of problem to explain how the problem can be solved / Interface Design	15%	35 marks
	Program correctness	50%	
	Code efficiency	15%	
	Formatted output and Pushing to remote Git repository	20%	
Total Marks			50 marks

Course Level Assessment Questions

Course Outcome 1 (CO1):

1. Write a C program 'sum.c' to add two numbers. Read the input from Standard Input and write output to Standard output. Compile and generate sum.out which is then debug with gdb.

2. Modify 'sum.c' by adding a function for finding the sum of two numbers. Then profile the executable with gprof.

Course Outcome 2 (CO2)

1. Create the Set ADT with Add, Remove, Union, Intersection and Difference operations. Implement using Bit Strings.

2. Implement the Disjoint set ADT with Create, Union and Find operations.

3. Implement Kruskal's algorithm using Disjoint sets.

Course Outcome 3(CO3):

1. Implement B-Tree and its operations..

2. Implement Red Black Tree and the associated operations.

Course Outcome 4 (CO4):

1. Create the Binomial Heap ADT and implement the basic operations.

2. Use any Mergeable Heap to implement Single source shortest path algorithm.

Course Outcome 5 (CO5):

1. Finding the strongly connected components of a directed graph.

2. Prim's Algorithm for Minimum cost spanning tree.

Syllabus:

Based on the syllabus of 20MCA105 Advanced Data Structures.

Text Books

1. Cormen T.H., Leiserson C.E, Rivest R.L. and Stein C, *Introduction to Algorithms,* Prentice Hall India, New Delhi, 2004

Reference Books

1. Kleinberg, Jon, and Eva Tardos. *Algorithm design*. Pearson Education India, 2006.

2. Aho A.V., Hopcroft J.E., and Ullman J.D., *Data Structures and Algorithms*, Pearson Education, New Delhi, 1983.

3. Sahni S., Data Structures, *Algorithms, and Applications in C++*, Mc Graw Hill, Singapore, 1998.

Web Reference

1. https://gcc.gnu.org/onlinedocs/gcc/Option-Summary.html
2. https://www.gnu.org/software/gdb/documentation/
3. https://ftp.gnu.org/old-gnu/Manuals/gprof-2.9.1/html_mono/gprof.html