Name:	
Enrolment No:	

Program Name: B.Tech-Mechatronics   Semester   : VII
Course Name   : Design Analysis of Algorithm   Time   : 3 hr
Course Code   : MECH 3014P   Max. Marks : 100
Instructions: Attempt all questions. Section B and C has one choice.

SECTION A
(5Qx4M=20Marks)

S. No.		Marks	CO
Q1.	List out all cases of Master Theorem.	**4 Marks**	**CO1**
Q2.	Solve recurrence relation $T(n)=2T(n/4)+\sqrt{n}$	**4 Marks**	**CO2**
Q3.	Solve recurrence relation $T(n)=3T(n/2) + 2n^2$	**4 Marks**	**CO3**
Q4.	Explain in brief the basic asymptotic efficiency classes.	**4 Marks**	**CO3**
Q5.	Explain the concepts of P, NP and NP complete problems.	**4 Marks**	**CO5**

SECTION B
(4Qx10M= 40 Marks)

Q6.	Describe steps for Prim's algorithm with suitable example.	**10 Marks**	**CO1**
Q7.	Differentiate performance measurement and performance estimation of algorithms.	**10 Marks**	**CO2**
Q8.	Devise a divide-and-conquer algorithm for finding the position of the largest element in an array of n numbers.	**10 Marks**	**CO3**
Q9.	Illustrate an algorithm which appends (concatenates) a linear list to another linear list. Find time complexity.	**10 Marks**	**CO5**
	OR		
	Describe Hamiltonian Paths in directed graph with example.	**10 Marks**	**CO4**

SECTION-C
(2Qx20M=40 Marks)

Q10.	Suppose you are given the array A = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12], and you then perform the binary search algorithm find the number 8. Which numbers in the array A are compared against the number 8?	**20 Marks**	**CO2**
Q11.	Solve the following Knapsack problem using greedy approach, where Knapsack capacity W=16	**20 Marks**	**CO4**

Item	Weight	Value
1	10	100
2	7	63
3	8	56
4	4	12

OR		
Given as input a word form assigned to the variable WORD, derive Function ORD_FIND which finds the ORD_WORDS array looking for the word form. If the word form is present, its index location in ORD_WORDS is returned; otherwise, a value zero is returned. Derive recurrence relation and estimate complexity of the problem.	**20 Marks**	**CO3**