

Anjuman Islam Janjira Degree College of Science Murud-Janjira, Raigad-402401 Affiliated to University of Mumbai As per NEP 2020	
Class: -F.Y.B.Sc.(C.S.)	Subject: - : Design & Analysis of Algorithms
Semester:- II	Vertical:- Major(MJ3)
Exam Event:- Summer2026 (FH)	Marks: - 30
Date: - 20/03/2026	Duration: - 01:00 Hour

- N.B. –**
- 1 – All questions are compulsory.
 - 2 – All questions have internal choice.
 - 3 – Figures to the right indicate full marks.

Q1. Answer the following question. (Any 2 out of 4)

10

- 1) Sort the number [5,3,4,1,6,9,13,2] using insertion sort.
- 2) Write note on big “Ω” notation.
- 3) Find the time complexity for:
for i:=1 to n
for j:=i+1 to n
for k:=j+1 to n
z=z+1;
- 4) Explain Tower of Hanoi with figure.

Q2. Answer the following question. (Any 2 out of 4)

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- 1) Find the third smallest element (k=3) and input array 10,2,8,4,7,3,9.
- 2) Use brute force method to match pattern: “ABCDABD” of the string: “ABC ABCDAB ABCDABCDABDE”
- 3) For string matching, working module q= 13, how many spurious hits does the Rabin-Karp matcher encounters in text T=2359023141526739921 when looking for pattern p =31415.
- 4) For the following array [10,80,30,90,40,50,70] sort using quick sort algorithm.

Q3. Answer the following question. (Any 2 out of 4)

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- 1) What is an algorithm? Explain its characters and operations.
- 2) Convert the following expression into postfix expression $7 - (((x+y)/(j-3)) + y) / (4-2)$. Show stack representation.[Take x=6,y=4 and j=2]
- 3) When to use Greedy Algorithm? Give its advantages and disadvantages.
- 4) Define backtracking. Find a subset that adds up to exactly 9 from the set of numbers {3,4,5,6}.