ASSIGNMENT – 3
SUBJECT: ENGINEERING MATHEMATICS -III

Instructions:

1. Write your **Name, Roll No, Registration No** and put **signature on the top of the answer sheet.**

2. Scan your answer sheet as **PDF file** and name the file as **Roll No. <space> Name <space> Registration No.**

Question Allotment

Roll numbers	Question number
Roll Numbers 1-30	**1A and 1B**
Roll Numbers 31 – last and reregistered	**2A and 2B**

Questions

1A. Show that the number of partitions of n in which every part is odd is equal to the number of partitions of n with unequal parts.

1B. Find the following permutation for n=5 with initial permutation 12345.

(i) 34^{th} permutation in Lexicographical and reverse Lexicographical order

(ii) 108^{th} permutation in Fike's order.

2A. Use a Ferrer's graph to show that the number of partitions of an integers into parts of even size is equal to the number of partitions into parts such that each part occurs an even number of times.

2B. Let Z be the set of integers. Let n be a fixed integer. Define a relation ' congruent modulo n' denoted by '$\cong$ mod n' as follows. For all a, b $\in Z$, $a \cong b$ (mod n) iff n/(a-b) (ie n divides (a-b)). Show that the above relation is an equivalence relation.