Dr. Sukumar Mondal
Department of Mathematics
Raja N. L. Khan Women's College
(Autonomous)
Mindpaore, West Bengal, India
Email: sm5971@rediffmail.com

Professor Madhumangal Pal
Department of Applied Mathematics
with Oceanology and Computer
Programming, Vidyasagar University,
Midnapore, West Bengal, India
Email: mmpalvu@gmail.com

CERTIFICATE

This is to certify that the thesis entitled "*Design of Algorithms to Solve some Labelling Problems on Graphs with Applications*"which is being submitted by **Nupur Patra** (Reg. No.-390/Ph.D (Science) dated 27.06.2019), a research scholar in **Research Centre for Natural and Applied Sciences, Raja N.L.Khan Women's College (Autonomous), Affiliated to Vidyasagar University, Midnapore, West Bengal, India** in fulfillment of the degree of *Doctor of Philosophyin Science* is a record of bonafide research work carried out by him under our supervision and guidance. The thesis has fulfilled all the requirements as per the regulations of the Vidyasagar University, Midnapore. The resultsembodied in this thesis have not been submitted to any other University or Institute for the award of any degree or diploma.

(Sukumar Mondal) 15/07/2022

(Madhumangal Pal)

Professor Madhumangal Pa
Department of Applied Mathematics with
Oceanology and Computer Programming
VIDYASAGAR UNIVERSITY
Midnapore-721102, W.B.