DEPARTMENT OF CIVIL ENGINEERING

INDIAN INSTITUTE OF TECHNOLOGY DELHI

CVL 864 STRUCTURAL HEALTH MONITORING

02 APRIL 2022 MINOR II 8:00 - 8:30 AM

1) ALL QUESTIONS ARE COMPULSORY.

2) ASSUME ANY DATA NOT SUPPLIED BUT DEEMED NECESSARY BY YOU

Q (1) Determine the first natural frequency of vibration of a piezoelectric macro fibre composite (MFC) patch of size 28 X 7 X 0.3mm in the extensional mode. Given that the Young's modulus is 30.336 GPa, density 5440 kg/m^3.

[7 marks]

Q (2) Determine the mechanical impedance of the system shown in Fig 1. Note that the values indicated for various elements are in SI units. Assume an operational frequency of 1k Hz.

[8 marks]