Name: **Enrolment No:**	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2022

Course: **Structural Dynamics** **Semester : I**
Program: **M.Tech. Structural Engineering** **Time : 03 hrs.**
Course Code: CIVL 7006 **Max. Marks: 100**

Instructions:

SECTION A

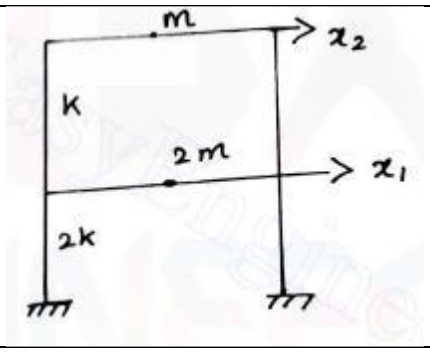
S. No.		Marks	CO
Q 1	A What is D' Alemberts principle? Explain how the principle is employed in vibration problems. B Explain Duhamel's integral in evaluating response of a structure. C Explain methods to evaluate damping. D State the concept of shear building. E What is meant by two degree of freedom system?	**5 x 4 = 20**	**CO1** **CO1** **CO1** **CO2** **CO2**

SECTION B

Q 2	A damped free vibration test is conducted to determine the dynamic properties of a one storey building. The mass of the building is 8000 kg. Initial displacement of the building is 0.6 cm. Maximum displacement on first cycle is 0.5cm and period of this displacement is 1.5s. Determine the i. effective weight, ii. undamped frequency, iii. logarithmic decrement, iv. damping ratio, v. damping coefficient, vi. damped frequency and vii. Amplitude after 5 cycles.	**20**	**CO1**
Q 3	Explain in detail about the forced vibration of undamped system. (MDOF)	**20**	**CO2**

SECTION-C

Q 4	Explain "Torsional Response of building" experiment of Virtual lab.	**20**	**CO3**
Q 5	Determine the (a) natural frequencies and (b) mode shape of the given system	**20**	**CO4**

		 m x_2 K 2m x_1 2k		