

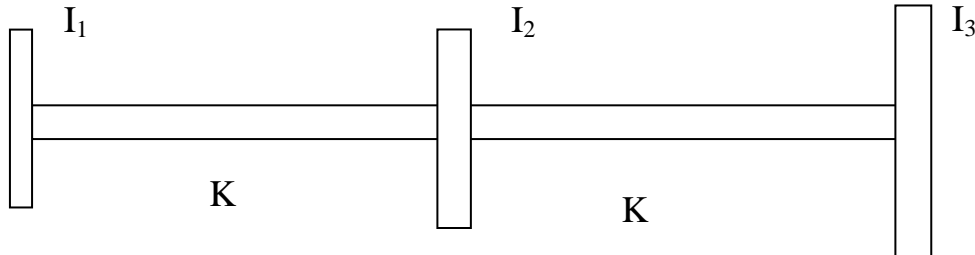


End Semester Examination – Nov/Dec – 2016

Code : 15ME3002
Sub. Name : Rotor Dynamics

Semester : 2016-17 ODD
Duration : 3hrs
Max. marks : 100

ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)

Q. No.	Sub Div.	Questions	Course Outcome	Marks
1.	a.	With neat sketch explain the different parts of a rotor system	CO1	14
	b.	Write short note about the software used for rotor dynamic analysis	CO3	6
(OR)				
2.	a.	With neat sketch, explain how vibration signals generated in rotor system are measured and displayed	CO3	20
3.	a.	A steel shaft of diameter 10cm is carrying three masses 2.5kg, 3.75kg and 7kg respectively (shown in Figure1). The distance between the rotors 0.7cm. Determine the natural frequencies of torsional vibrations. The radius of gyration of three rotors are 0.2, 0.3 and 0.4m respectively. Take $C=9 \times 10^8 \text{ N/m}^2$.	CO3	20
 <p>Figure1</p>				
(OR)				
4.	a.	Derive the equation of motion and solution for torsional vibration in rotating machinery(continuous system).	CO1	20
5.	a.	With necessary equations, explain the free and forced vibration response for a Single-DOF undamped rotor model.	CO2	20
(OR)				
6.	a.	Derive suitable expression for steady state response in a Jeffcott rotor model	CO1	20
7.	a.	Write the limitations of single DOF rotor model and brief about Rankine rotor model	CO1	10
	b.	Explain the methods to deduce unbalancing phenomena in rotors	CO2	10
(OR)				
8.	a.	Determine the natural frequency of a shaft, where one end is fixed and the other end free, subjected to torsional vibration.	CO1	20
<u>Compulsory:</u>				
9.	a.	Explain Single-DOF damped rotor model and explain the different cases of damping	CO1	20

ALL THE BEST