Sessional 2 (2025): B Tech Mechanical Engg.

Dynamics of Machines (PCC-ME-502/21)

Answer all question, missing data may be suitable assumed ***Tot Marks 15; Time: 90 min***

1	(a)	The following particulars refer to a Proell governor with open arms: Length of all arms = 200 mm; distance of pivot of arms from the axis of rotation = 40 mm; length of extension of lower arms to which each ball is attached = 100mm; mass of each ball = 6 kg and mass of the central load = 150 kg. If the radius of rotation of the balls is 180 mm when the arms are inclined at an angle of 40° to the axis of rotation, find the equilibrium speed for the above configuration.	(3)	CO3
	(b)	Define Sensitivity, stability, hunting and Isochronism of a governor	(2)	CO3
2	(a)	An aeroplane makes a complete half circle of 54 metres radius, towards left, when flying at 200 km per hr. The rotary engine and the propeller of the plane has a mass of 400 kg and a radius of gyration of 0.3 m. The engine rotates at 2000 r.p.m. clockwise when viewed from the rear. Find the gyroscopic couple on the aircraft and state its effect on it.	(3)	CO4
	(b)	Explain the Effect of Gyroscopic Couple on a Naval Ship during Steering, pitching and rolling.	(2)	CO4
3	(a)	Derive an expression for natural frequency of a free longitudinal vibration by energy method.	(3)	CO5
	(b)	What is Vibration isolation? Explain with neat sketch.	(2)	CO5