Roll No.												

PRESIDENCY UNIVERSITY
BENGALURU
School of Engineering
Mid-Term Examinations - November 2024

Semester: V
Course Code: MEC3085
Course Name: Dynamics of Machines
Program: B.TECH

Date: 6-11-2024
Time: 02:00pm – 03:300pm
Max Marks: 50
Weightage: 25%

Instructions:
(i) Read all questions carefully and answer accordingly.
(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. 2Mx5Q=10M

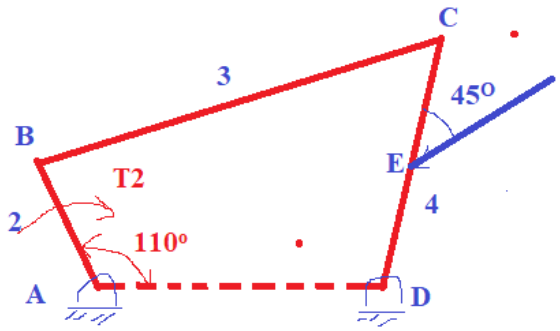
1	Write the condition for equilibrium of three force member.	2 Marks	L1	CO1
2	Define dynamic analysis.	2 Marks	L1	CO2
3	Define D'Almbert's Principle.	2 Marks	L1	CO1
4	Define static force analysis.	2 Marks	L1	CO2
5	What is static equilibrium?	2 Marks	L1	CO2

Part B

Answer ALL Questions. Each question carries 10 marks. 4QX10M=40M

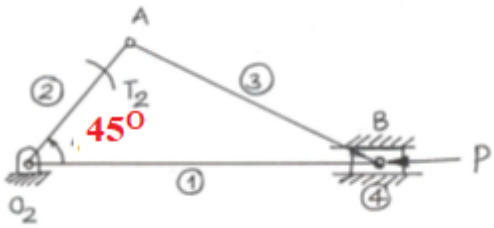
6	6a	With suitable example define Active Force and Reactive Force	5 Marks	L2	CO1
	6b	With a neat sketch explain Gyroscopic couple	5 Marks	L2	CO1
		OR			
7	7a	With a suitable sketch explain the static force analysis of four bar mechanism	5 Marks	L2	CO2
	7b	With a suitable sketch explain the static force analysis of slider crank mechanism	5 Marks	L2	CO2

8	An airplane makes a complete half circle of 100 meters radius, towards left, when flying at 300 km/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 300 r.p.m. clockwise when viewed from the rear. Find the gyroscopic couple on the aircraft and state its effect on it.	10 Marks	L3	CO1
	OR			
9	A uniform disc of diameter 300 mm and of mass 5 kg is mounted on one end of an arm of length 600 mm. The other end of the arm is free to rotate in a universal bearing. If the disc rotates about the arm with a speed of 300 r.p.m. clockwise, looking from the front, with what speed will it precess about the vertical axis?	10 Marks	L3	CO2
10	In a fig. A Four bar Mechanism is shown. Calculate the required value of T2 and various forces on the links fo the equilibrium of the system F = 2000N, AD =215mm, AB = 200mm, BC = 370 mm, DC =350mm and CE =100mm.	10 Marks	L3	CO1

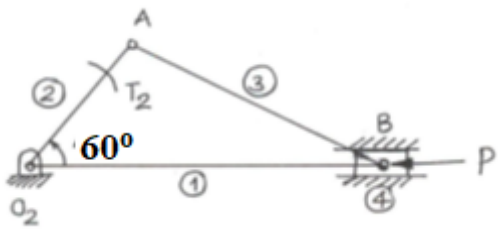


OR

11	Figure shows a slider crank mechanism in which the resultant external load P= 2000N ,acts on the piston. The system is kept in equilibrium as a result of the couple applied to the crank 2, The linkage dimensions are AO_2 = 100mm,AO_2B = 45° Determine forces acting on all the links and the couple on link 2. Link 3 = 285mm.	10 Marks	L3	CO1



12	Figure shows a slider crank mechanism in which the resultant external load P= 3000N ,acts on the piston. The system is kept in equilibrium as a result of the couple applied to the crank 2, The linkage dimensions are AO_2 = 100mm,AO_2B = 60° Determine forces acting on all the links and the couple on link 2. Link 3 = 300mm.	10 Marks	L3	CO1



OR

13	A four-link mechanism is acted upon by forces as shown in the figure. Determine the torque T2 to be applied on link 2 to keep the mechanism in equilibrium. AD=50mm, AB=40mm, BC=100mm, Dc=75mm, DE= 35mm.	10 Marks	L3	CO1