

CBCS SCHEME

USN

--	--	--	--	--	--	--	--	--	--

BAU401

Fourth Semester B.E./B.Tech. Degree Examination, June/July 2026

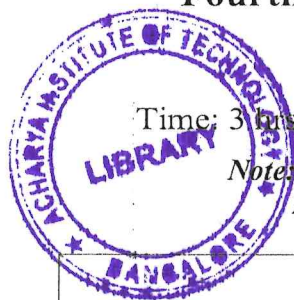
Theory of Machines

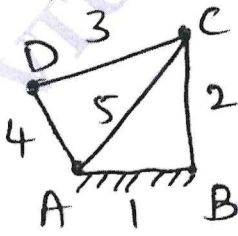
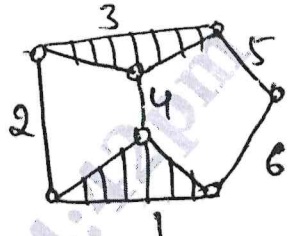
Time: 3 hrs.

Max. Marks: 100

Notes: 1. Answer any FIVE full questions, choosing ONE full question from each module.

2. M : Marks, L: Bloom's level, C: Course outcomes.

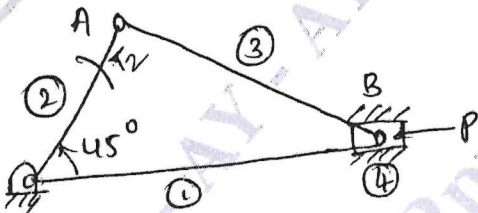


Module – 1				M	L	C
Q.1	a.	Define the following term : i) Kinematic link ii) Kinematic pair iii) Kinematic chain iv) Mechanism v) Inversion		05	L1	CO1
	b.	Define Degrees of Freedom. Determine the DOF of the mechanism shown in Fig.Q1(b)(i) and Fig.Q1(b)(ii).  Fig.Q1(b)(i)  Fig.Q1(b)(ii)		05	L2	CO1
	c.	Explain Single Slider Crank Chain.		10	L2	CO1
OR						
Q.2	a.	Explain velocity and acceleration graphical analysis of four bar mechanism.		10	L2	CO1
	b.	Discuss the velocity of rubbing.		10	L2	CO1
Module – 2						
Q.3	a.	With a neat sketch explain Gear Terminology.		10	L2	CO2
	b.	Two gear wheels mesh externally to give velocity ratio of 3 to 1. The involute teeth has 6 mm module and 20° pressure angle. Addendum is equal to one module. The pinion rotates at 90 rpm. Determine : (i) Number of teeth on pinion to avoid interference and the corresponding number on the wheel. (ii) The length of path and arc of contact.		10	L3	CO2

OR

Q.4		Draw the profile of cam operating a knife edge follower from following data: i) Follower to move outwards through 40 mm during 60° of cam rotation. ii) Follower dwells for next 45° iii) Follower to return to it's original position during next 90° iv) Follower to dwell for rest of rotation the displacement of follower is to take place with simple harmonic motion during both outward and return stroke. The least radius of cam is 50 mm if the cam rotates at 300 rpm.	20	L3	CO2
-----	--	--	----	----	-----

Module – 3

Q.5	a.	Discuss equilibrium of two and three force member.	10	L2	CO3
	b.	Fig.Q5(b) shows a slider crank mechanism in which the resultant gas pressure $8 \times 10^4 \text{ Nm}^{-2}$ acts on the piston of cross sectional area 0.1 m^2 . The system is kept in equilibrium as a result of the couple applied to the crank 2, through the shaft at O_2 . Determine forces acting on all the links (including pins) and the couple on 2. 	10	L2	CO3

OR

Q.6	a.	State and explain D' Alembert's principle of dynamic equilibrium.	10	L2	CO3
	b.	Discuss Inertia Force and Inertia Torque.	10	L2	CO3

Module – 4

Q.7	a.	Differentiate between Flywheel and Governor.	10	L2	CO4
	b.	A flywheel that rotates at maximum speed of 250 rpm the radius of gyration of the flywheel is 0.5 m. A punching press is driven by a constant torque electric motor, the press is provided with the press punches 750 holes per hour. Each punching operation take 1.8 s and requires 14000 Nm of energy, if speed of the same is not to fall below 225 rpm. Find the (i) Power of motor (ii) Mass of the flywheel.	10	L4	CO4

OR

Q.8	a.	With neat sketch explain analysis of porter governor.	10	L2	CO4
	b.	Discuss on Quality of Governors.	10	L2	CO4

Module – 5

Q.9	a.	Explain the Force Analysis of Sliding Body.	10	L3	CO5
	b.	Discuss briefly about : (i) Flat Pivot Bearing (ii) Flat Collar Bearing	10	L2	CO5

OR

Q.10	a.	Differentiate between Belt drive and Chain drive.	10	L2	CO5
	b.	Derive an expression for cross belt drive length.	10	L2	CO5
