

P P SAVANI UNIVERSITY

Fourth Semester of B. Tech. Examination

December 2022

SEME2081 Kinematics of Machinery

05.12.2022, Wednesday

Time: 01:00 p.m. To 03:30 p.m.

Maximum Marks: 60

Instructions:

1. The question paper comprises of two sections.
2. Section I and II must be attempted in separate answer sheets.
3. Make suitable assumptions and draw neat figures wherever required.
4. Use of scientific calculator is allowed.

SECTION - I

Q - 1	Define (any five)	[05]	CO	BTI.
(i)	Mechanism		1	1
(ii)	Machine		1	1
(iii)	Angular Acceleration		2	3
(iv)	Linear velocity		2	3
(v)	Link		1	1
(vi)	Kinematic pair		1	1
(vii)	linkage		1	1
Q - 2 (a)	Define and explain double slider crank chain.	[05]	1	1
Q - 2 (b)	Define and explain quick return mechanism.	[05]	1	1
	OR			
Q - 2 (a)	Explain Grashoff's mechanism for four bar chain.	[05]	1	1
Q - 2 (b)	What are the inversions of double slider crank chain?	[05]	1	1
Q - 3 (a)	Define angular velocity, relative velocity, relative displacement and displacement.	[05]	2	3
Q - 3 (b)	Define linear acceleration. Explain radial and transverse components of acceleration.	[05]	2	3
	OR			
Q - 3 (a)	Explain velocity analysis using relative velocity method.	[05]	1	1
Q - 3 (b)	What is radial and transverse components of acceleration?	[05]	2	3
Q - 4	Attempt any one	[05]		
(i)	Write down the classification of kinematic pair.		1	1
(ii)	Define Instantaneous axes of motion and state the properties of instantaneous center.		1	1

SECTION - II

Q - 1	Define (any five)	[05]		
(i)	Creep		3	3
(ii)	Slip		3	3
(iii)	Circular pitch		4	6
(iv)	Addendum		4	6
(v)	Dedendum		4	6
(vi)	Pitch circle		4	6
(vii)	Prime circle		4	6
Q - 2 (a)	Draw cam profile and explain various terms stated under cam profile.	[05]	5	6
Q - 2 (b)	Draw gear terminology and explain various terms under gear terminology.	[05]	4	6

OR		
Q - 2 (a)	Derive equation for length of crossed belt drive.	[05] 3 3
Q - 2 (b)	Derive equation for length of open belt drive.	[05] 3 3
Q - 3 (a)	What are the differences between gear drive and belt drive?	[05] 3, 4 3, 6
Q - 3 (b)	What are the differences between open belt drive and crossed belt drive?	[05] 3 3
OR		
Q - 3 (a)	Differentiate between cycloidal and involute tooth forms.	[05] 4 6
Q - 3 (b)	Write down the classification of bevel gear. Also draw the various types of bevel gear.	[05] 4 6
Q - 4	Attempt any one	[05]
(i)	Explain the advantages of bevel gear over spur gear.	4 6
(ii)	How herringbone gear is different from spur gear. Explain with proper diagram.	4 6

CO : Course Outcome Number

BTL : Blooms Taxonomy Level

Level of Bloom's Revised Taxonomy in Assessment

1: Remember	2: Understand	3: Apply
4: Analyze	5: Evaluate	6: Create