Reg. No.										

MANIPAL INSTITUTE OF TECHNOLOGY

MANIPAL

(A constituent unit of MAHE, Manipal)

DEPARTMENT OF MECHATRONICS

V SEMESTER B.TECH. MECHATRONICS

END SEMESTER EXAMINATIONS (Make-Up), FEB 2022

SUBJECT: THEORY OF MACHINES [MTE 3154]

(24/02/2022)

Time: 75+10 Minutes **MAX. MARKS: 20**

Instructions to Candidates:

- Answer **ALL** the questions.
- Data not provided may be suitable assumed.

Q. No		M	CO	PO	LO	BL
1a	Design a mechanism, using only three lower pairs. Sketch and explain its working principle.	**3**	**1**	**4**	**4**	**3**
1b	Determine the 3 accurate points of chebychew spacing by graphical method, in the range of 2<x<6	**2**	**5**	**2**	**4**	**3**
1c	In a slider crank mechanism, the crank is 480 mm long and rotates at 20 rad/s in the counter clockwise direction. The length of the connecting rod is 1.6 m. When the crank turns 60^{o} from the inner dead centre, determine the a. Velocity of the slider b. Velocity of a point E located at a distance 450 mm on the connecting rod extended	**5**	**2**	**2,3**	**2,3**	**4**
2a	Develop a mechanism from double slider crank mechanism, which converts reciprocating motion in to rotary motion. Sketch and explain its working principle.	**4**	**1**	**1,2**	**1,2**	**3**
2b	In a reverted epicyclic train, the arm F carries two wheels A and D and a compound wheel B-C. The wheel A meshes with wheel B and the wheel D meshes with wheel C. The number of teeth on wheel A, D and C are 80, 48 and 72 respectively. Find the speed and direction of wheel D when wheel A is fixed and arm F, makes 200 rpm clockwise.	**4**	**4**	**2,3**	**2,3**	**4**
2c	Identify the mechanism used in work holding devices. With a sketch explain its unique characteristics	**2**	**1**	**1**	**3**	**3**