Hall Ticket Number:

Code No. : 14565 O

VASAVI COLLEGE OF ENGINEERING *(AUTONOMOUS)*, HYDERABAD

Accredited by NAAC with A++ Grade

B.E. (Mech. Engg.) IV-Semester Backlog Examinations, July-2023

Kinematics of Machines

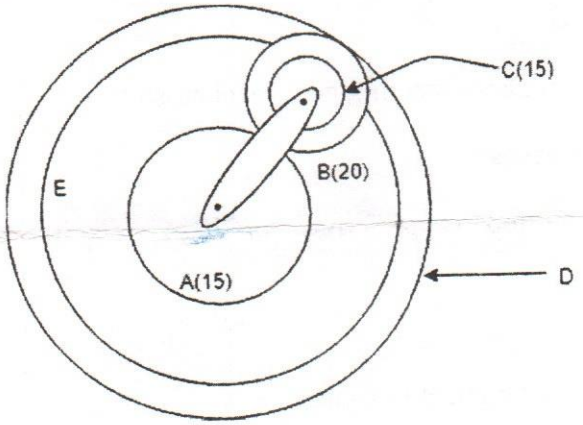
Time: **3 hours** Max. Marks: **60**

*Note: Answer all questions from **Part-A** and any **FIVE** from **Part-B***

Part-A (10× 2 = 20 Marks)

Q. No.	Stem of the question	M	L	CO	PO
1.	Distinguish between Mechanism and Structure.	2	2	1	1
2.	What is DOF of a mechanism?	2	2	1	2
3.	Define Instantaneous center of velocity.	2	1	2	1
4.	What is Coriolis acceleration?	2	1	2	1
5.	What types of pairs are used in Davis steering gear mechanism?	2	1	3	1
6.	Define slip and creep in belt drives.	2	1	3	1
7.	Which type of follower motion is preferred for high velocity requirement?	2	2	4	2
8.	Classify Cams.	2	1	4	1
9.	Define pressure angle and Arc of contact in Gears.	2	2	5	1
10.	Which type of Gear trains are used in clocks and mention the reason.	2	2	5	2
	Part-B (5 × 8 = 40 Marks)				
11. a)	List the inversions of Double slider crank chain.	2	1	1	1
b)	Explain the working of Crank and Slotted lever quick return motion mechanism with a neat sketch.	6	3	1	3
12.	Determine the velocity and acceleration of a slider in a slider crank mechanism when the crank has turned 30^0 from TDC. The lengths of crank and connecting rod are 100 mm and 300 mm respectively. he crank rotates with uniform velocity of 24 rad/ sec.	8	4	2	3
13. a)	Explain working of Ackerman steering gear mechanism with a neat sketch.	4	2	3	1
b)	A belt runs over a pulley 800 mm diameter and running at a speed of 180 rpm. if the lap angle is and the maximum tension in the belt is 2 kN. Determine the power transmitted if the coefficient of friction between the belt and pulley is 0.3.	4	4	3	4

Contd... 2

14.	Draw the profile of a radial cam operating a roller follower of radius 10 mm having a lift of 35mm. The cam raises the follower with SHM for 120^0 of the rotation followed by a period of dwell for 60^0. The follower descends for the next 150^0 rotation of the cam with uniform velocity, again followed by a dwell period. The cam rotates at a uniform velocity of 150 rpm and has a least radius of 25mm. What will be the maximum velocity and acceleration of the follower during the lift and the return?	8	3	4	4
15	Figure shows epi-cyclic gear train pinion .A has 15 teeth a bar is rigidly fix to meter shaft. The wheel B has 20 teeth and meshes with gear A and also with annular fix wheel D, pinion C has 15 teeth and integral with B gear. The gear C match with annular wheel E which is keyed to the machine shaft .The arm rotates on about same shaft on which A is fixed and carries the compound wheel B and C is motor and at 1000 rpm find speed of machine shaft? 	8	3	5	3
16. a)	Classify kinematic pairs and explain.	4	2	1	1
b)	Discuss the Procedure of kinematic analysis of slider crank mechanism.	4	2	2	2
17.	Answer any ***two*** of the following:				
a)	Develop the formula of Ratio of friction tensions in belt drive.	4	2	3	1
b)	Explain the parabolic motion of follower.	4	2	4	2
c)	Classify Gears and list the advantages of gear drives.	4	1	5	1

M : Marks; L: Bloom's Taxonomy Level; CO; Course Outcome; PO: Programme Outcome

i)	Blooms Taxonomy Level – 1	20%
ii)	Blooms Taxonomy Level – 2	37.5%
iii)	Blooms Taxonomy Level – 3 & 4	42.5%

*****