

CONTINUOUS INTERNAL EVALUATION- 3

Dept: Civil Engg	Sem / Div: I sem	Sub: Elements of Civil Engg & Engg. Mechanics	S Code: 18CIV14
Date: 09-04-2021	Time: 9:30-11:00 am	Max Marks: 50	Elective: N
Note: Answer any 2 full questions, choosing one full question from each part.			

QN	Questions	Marks	RBT	COs
PART A				
1 a	Derive the expression for centroid of a semicircle.	10	L1	CO4
b	Determine centroid of the figure shown 1	15	L3	CO4
OR				
2 a	State and prove parallel axis theorem.	10	L1	CO4
b	Find the polar moment of inertia of the plane lamina about point O	15	L3	CO4
PART B				
3 a	What is centrifugal force? What is super elevation?	8	L2	CO5
b	A stone is dropped from the top of the tower 50m high. At the same time another stone is thrown up from the tower with a velocity of 25m/sec. At what distance from the top and after how much time the two stones cross each other?	9	L3	CO5
c	The motion of a particle is given by the equation $x = t^3 - 3t^2 - 9t + 12$. Determine the time, distance travelled and acceleration of particle when velocity becomes zero.	8	L2	CO5
OR				
4 a	What is projectile? Define the following terms briefly) Angle of projection ii) Horizontal range iii) Vertical height iv) Time of flight	8	L2	CO5
b	A burglar's car starts at an acceleration of 2m/s^2 . A police vigilant party came after 5s and continued to chase the burglar's car with a uniform velocity of 20m/s . find the time taken in which the police van will overtake the car.	8	L3	CO5
c	The motion of a particle is described by the following equation $x = 2(t + 1)^2$, $y = 2(t + 1)^{-2}$. Show that path travelled by the particle is rectangular hyperbola. Also find the velocity and acceleration of particle at $t = 0$	9	L3	CO5

