8.

Define Linear velocity.

CO₅ U

Question Paper Code: 99402

B.E. / B.Tech. DEGREE EXAMINATION, NOV 2023

Elective

Electronics and Communication Engineering

10HECON2 DRINCHHES OF POROTICS

		190EC902-FRINCFIL	LES OF ROBOTICS		
		(Regulatio	n 2019)		
Dur	ation: Three hours			Maximum: 10	0 Marks
		Answer ALL	Questions		
		PART A - (5 x	1 = 5 Marks)		
1.	If a robot has 3 legs, then the number of possible events is				CO1-U
	(a) 24	(b) 720	(c) 120	(d) 240	
2.	The unit of linear acc	eleration is			CO2- U
	(a) kg-m	(b) m/s	(c) m/s2d	(d) rad/s22	
3.	The inertia matrix of	a rigid body or a link			CO3- U
	(a) is always positive definite				
	(b)is always symmetr	ric			
	(c)is an orthogonal m	natrix			
	(d) represents the ma	ss distribution in 3D spa	ice		
4.	Gross motion planning	ng problem is known a?			CO4- U
	(a) Fine motion plans	ning problem.	(b) Free space motion planning problem.		
	(c) Compliant motion	n planning problem	(d) none of the abo	ve.	
5.	What is necessity for a lot of sensible mobile robotics funaction				CO5- U
	(a) Map discovery	(b) Geomatric Maps	(c) Perceptul maps	(d) Sensori	al maps
		PART - B (5 x 3)	3= 15 Marks)		
6.	What is meant by rob	oot anatomy?			CO1 U
7.	What is meant by uni	t Quaternion			CO2 U

9.	Def	ine path.	C	O3 U
10.	Mer	ntion the need of continuous Trajectory Recording	C	O3 U
		PART – C (5 x 16= 80 Marks)		
11.	(a)	Explain the different types of robots with neat diagrams Or	CO1-U	(16)
	(b)	Discuss about micro machines in robotics	CO1-U	(16)
12.	(a)	Derive the Denavit- Hartenberg representation of forward kinematic equations of robots	CO2- App	(16)
	(b)	Or Derive the direct kinematics equation of SCARA robot using D H transformation matrix.	CO2- App	(16)
13.	(a)	Express the jacobian matrix for motion of end-effecter generated by a rotary joint and prismatic joint. Or	CO1-U	(16)
	(b)	Explain the following: (i) Wrist and arm singularity (ii) Linear and Angular velocities	CO1-U	(16)
14.	(a)	Implement interpolation function with the help of p-Degree polynomial and discuss its uses. Or	CO3- Ana	(16)
	(b)	Express the time history of position velocity and acceleration for blended trajectory for point-to-point motion with via points.	CO3- Ana	(16)
15.	(a)	Discuss in detail Methods of Robot programming with suitable example.	CO1-U	(16)
	(b)	Or Explain in detail Robot program as a path in space with suitable	CO1-U	(16)
	(b)	example	CO1-0	(16)