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Roll No.

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APR-MAY

B. E. (Eighth Semester) Examination, 2020

(Old Scheme)

(Mech. & Mechatronics Engg. Branch)

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Time Allowed: Three hours

(c) Master thindamental rotation may icos? (Phisiumber) **08 :** shah mumixaM.
Thus findamen after the formulation.

not within no Minimum, Pass Marks in 28 , 1900 B

Note: Attempt all the questions. Part (a) of each question is compulosry. Answer any two questions from parts (b), (c) and (d).

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es **Anit-l**o no repaisançai

1. (a) Define a robot.

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(b) What do you mean by Robot Anatomy? Stiff (a) 27

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	[~]			
	(c) Discuss the difference between polar arm and			(b) Explain
	articulated arm configuration.	7		of diag
	(d) What are design and control issues in robotics?			(c) Why do
	Explain briefly.	7		(d) The fo
	Unit-N			depend
2.	(a) What is Mapping?	2		
	North & Northgironies Phys. Brandal			(-) D - C
	(b) Find composite matrix for yaw-pitch-roll transforma-	_	4.	(a) Define
	tion.	7		(b) Explain
	(c) What are fundamental rotation matrices? Obtain the			of robo
	three fundamental rotations matrices for rotation			
	about x , y and z axis from the rotation matrix for			(c) Briefly
	rotation about an arbitrary axis k?	7		used in of each
	(d) The co-ordinates of point P in frame $\{1\}$ are			00 0000
	$[3.0 \ 2.0 \ 1.0]^T$. The position vector P is rotated about			(d) Explain
	the z-axis by 45°. Find the co-ordinates of point Q ,			
	the new position of point P ?	7		
			5.	(a) What a
	Unit-III	. 1		(b) What a
3.	(a) What is forward & inverse kinematics?	2		by a ro

of diagram.	7
(c) Why do multiple solutions exist in inverse kinematics?	7
(d) The foward kinematic model of a manipulator depends on the choice of home.	7
Unit-IV	
(a) Define Sensors. Write the name of external sensors.	2
(b) Explain with detail with block diagram of architecture of robot vision system.	7
(c) Briefly describe the working of some contact sensors	
used in robotics. Give advantages & disadvantages	
of each.	7
(d) Explain image processing.	7
Unit-V	
(a) What are the Non-Industrial applications of robot?	2
(b) What are various material handling tasks performed by a robot?	7
	(c) Why do multiple solutions exist in inverse kinematics? (d) The foward kinematic model of a manipulator depends on the choice of home. Unit-IV (a) Define Sensors. Write the name of external sensors. (b) Explain with detail with block diagram of architecture of robot vision system. (c) Briefly describe the working of some contact sensors used in robotics. Give advantages & disadvantages of each. (d) Explain image processing. Unit-V (a) What are the Non-Industrial applications of robot?

(c) Discuss the robotic application in the field of	1
(i) Quality control-inspection	
(ii) Arc welding	
(d) Write the short notes on:	7
(i) Robot safety	
(ii) Justification of robot	
L. 743 Define Sensors. Write the name of economic cosmo	
the Equation with steam well block daggain of promonent of mean vision system.	
(c) Briefly describe the century of some contag acresses	
Smissond affirm undd e T. (i)	
Y-No.J	
. (a) What we the Non-Industrial applications of robot?	
(b) What we surious material handling systes performed	