GOVERNMENT COLLEGE OF ENGINEERING, JALGAON

(An Autonomous Institute of Government of Maharashtra)

National Highway No.6, JALGAON – 425 002

Phone No.: 0257-2281522	Fax No.: 0257-2281319
Website : www.gcoej.ac.in	E-mail : princoej@redifmail.com

Name of Examination : **Winter 2020** - (Preview)

Course Code & Course Name : **ME403C - Inter-disciplinary Elective-Introduction to Roboti**

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Maximum Marks : **60**   Duration : **3 Hrs**

Edit   Print   View Answer Key   Close   **Answer Key Submission Type:** Marking scheme with model answers and solutions of numerical

Instructions:

1. *All questions are compulsory.*
2. *Illustrate your answer with suitable figures/sketches wherever necessary.*
3. *Assume suitable additional data; if required.*
4. *Use of logarithmic table, drawing instruments and non programmable calculators is allowed.*
5. *Figures to the right indicate full marks.*

1)	a)	Define the following: i) Work volume, ii) Spatial Resolution, iii) Accuracy, iv) Repeatability	[4]
	b)	What is an industrial robot? Explain common robot configuration with a neat diagram	[4]
	c) i.	Explain any four types of joints used in robot manipulators with neat sketch. **OR**	[4]
	ii.	Compare the point to point and continuous path system	[4]
2)		**Solve any four.**	
	a)	Which characteristics make DC servomotors a popular choice in robotics? State any two applications.	[3]
	b)	Give any six applications of robots in the industry.	[3]
	c)	Briefly explain various power transmission systems used in robotics.	[3]
	d)	Write short note on Positional and Velocity sensors.	[3]
	e)	Write a short note on actuators used in robotics.	[3]
3)	a)	"An end effector attached to a robot makes the robot specialized for a particular task". Explain the statement.	[4]
	b)	Explain any four types of grippers in detail with neat sketch.	[6]
	c) i.	What are the uses of touch sensors in the context of the robot. **OR**	[2]
	ii.	Briefly discuss force sensors used in robotics.	[2]
4)		**Solve any two.**	
	a)	Explain the machine vision system in robotics and automation with its applications?	[6]
	b)	Analyze the 'Image Processing and Analysis' part of the machine vision system by explaining its subparts.	[6]
	c)	Explain the 'Langrange's analysis of manipulator and components'.	[6]
5)		**Solve any four.**	
	a)	Explain the manual lead through programming method in robot applications in detail.	[3]
	b)	Explain WAIT, DELAY, SIGNAL command with suitable examples.	[3]
	c)	Explain second-generation language in detail with examples.	[3]
	d)	Explain robot language structure with a diagram of robot system showing various components of the system that must be coordinated by means of the language.	[3]
	e)	Write short note on constants and variables in robot programming languages.	[3]

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