Code No: RT32034 **R13** SET - 1

III B. Tech II Semester Supplementary Examinations, November- 2017

ROBOTICS

(Mechanical Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answering the question in **Part-A** is compulsory
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1	a)	What is work volume?	[3M]
	b)	What are the three degrees of freedom associated with the arm and body motion?	[4M]
	c)	What is meant by pitch, yaw and roll?	[4M]
	d)	What is jacobian?	[3M]
	e)	Define skew motion	[4M]
	f)	List out the types of Drive systems used in Robots.	[4M]

PART –B

2		What is work envelope? Draw work envelope for Cartesian coordinate, cylindrical coordinate and spherical coordinate.	[16M]
3	a)	What are the common types of arm explain?	[8M]
	b)	What are the requirement and challenges of end effector?	[8M]
4	a)	Derive generalized equation for D-H convention.	[8M]
	b)	Explain with an example the kinematic equations using homogeneous transformations robot end effector.	[8M]
5	a)	Explain Newton –Euler formulation. Write its applications.	[8M]
	b)	What is differential transformation? How are they useful in the context of Robitics?	[8M]
6	a)	Explain about Robot motion planning.	[8M]
	b)	By considering examples solve fifth order polynomial trajectory planning.	[8M]
7		Explain about types of actuator with neat sketch.	[16M]

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