(3 Hours) **Total Marks: 80**

NB

1) Question **number 1** is compulsory
2) Attempt **any three** out of the remaining five questions.
3) Assume suitable data if **necessary** and justify the assumptions.
4) **Draw** neat and **clean** diagrams
5) Figures to the **right** indicate full marks

Q1		Attempt any 4/5	**20**
	a)	With the help of suitable diagram give illustration of gray level slicing and its applications.	
	b)	Discuss in brief CCD sensors with the help of suitable diagram.	
	c)	What is template matching? Discuss various challenges associated with template matching.	
	d)	How motion pattern estimation is determined?	
	e)	Discuss importance of Gaussian filter and applications.	
	f)	Write Prewitt and Sobel Operator mask and give it's importance.	
Q2	a)	What is thresholding? How is it useful in segmentation?	**10**
	b)	Discuss Affine Transformation with necessary equations.	**10**
Q3	a)	Differentiate between line scan camera and area scan camera in brief.	**10**
	b)	Discuss in brief Lenses and their parameters.	**10**
Q4	a)	Explain Opening and closing operation in brief	**10**
	b)	With suitable example explain process of region growing for image segmentation.	**10**
Q5	a)	What is optical flow? How optical flow is used for motion estimation?	**10**
	b)	Explain concept of video tracking and discuss methods of video tracking.	**10**
Q6		Write short notes on (Any Five /Four)	**20**
	a)	Hit or Miss transformation	
	b)	Relevance of machine vision in industry 4.0	
	c)	Edge based segmentation	
	d)	Face Recognition using Eigen Vectors	
	e)	Human vision system	
	f)	CCD sensor	