Q24. State and explain various methods of image acquisition.

(or)

Explain about image acquisition.

Ans: Oct./Nov.-18, Set-4, Q2(a)

The various methods of image acquisition are as follows,

1. **Image Acquisition using Single Sensor:** Consider the components of single sensor shown in figure (1).

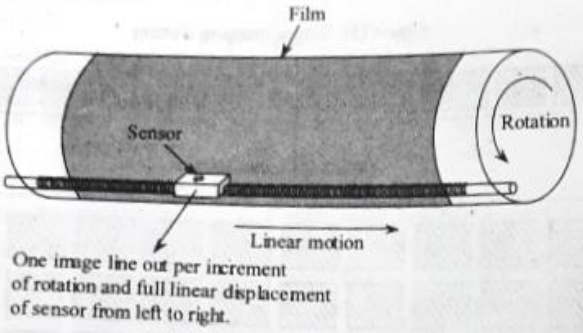

Figure (1): Image Acquisition using Single Sensor

The purpose of image acquisition is to generate 2-D image. The sensor used in figure (1) is a photodiode whose output voltage is directly proportional to the light. For improving sensitivity, filters are used infront of sensor.

For generating the 2-D image using single sensor, their should be relative displacement between the sensor and area to be imaged.

In figure (1), a negative film is mounted on drum whose mechanical rotation provides displacement in one dimension. The single sensor mounted on the lead screw provides movement in perpendicular direction. This method is an economical way to obtain high resolution images. This arrangement can be used to acquire images using strip sensors and array sensors.

2. **Image Acquisition using Sensor Strips:** The general arrangement for image acquisition using sensor strips is shown in figure (2).

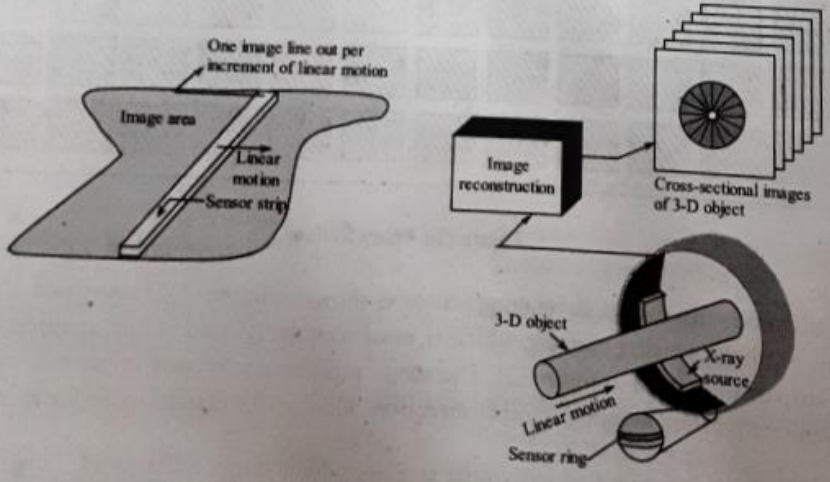

Figure (2): Image Acquisition using Sensor Strips

The motion along the strip gives image elements in one direction and that of perpendicular direction to the strip gives aging in other direction.

Image Acquisition using Sensor Arrays: The arrangement shown in figure (3) contains the sensors arranged in the form of 2-D array.

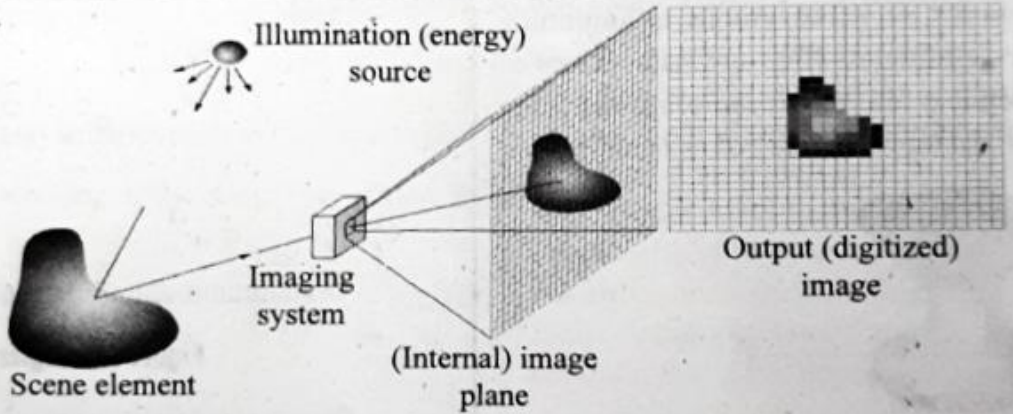

Figure (3): Image Acquisition using Sensor Arrays

The main advantage of this method is, complete image can be obtained by focusing the energy pattern on to the surface of the array.