JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -2 EXAMINATION- April 2023

B.Tech. ECE/CE/BI/BT 8th Semester

COURSE CODE: 21B1WCI831

MAX. MARKS: 25

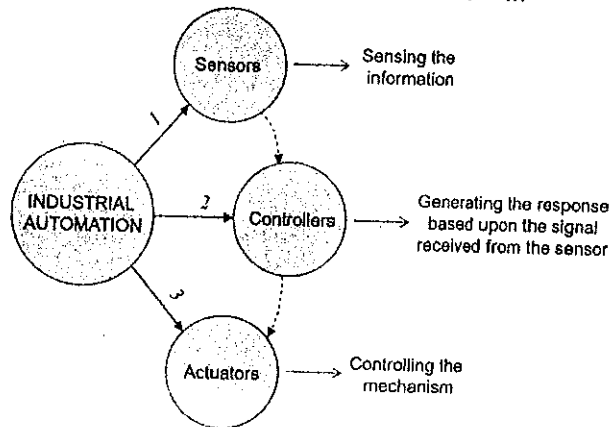COURSE NAME: DIGITAL TWIN – FUNDAMENTAL CONCEPTS TO APPLICATIONS IN ADVANCED MANUFACTURING

COURSE CREDITS: 03

MAX. TIME: 1.5 Hrs
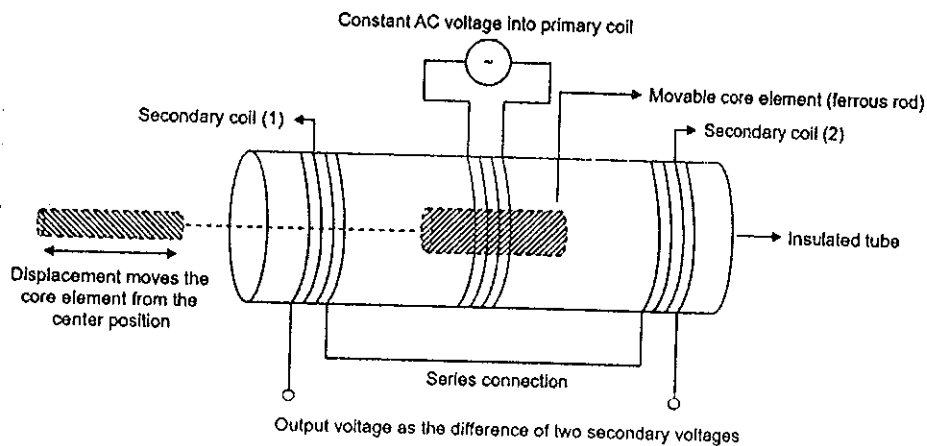
COURSE INSTRUCTOR: Prof. (Dr.) Vivek Kumar Sehgal

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

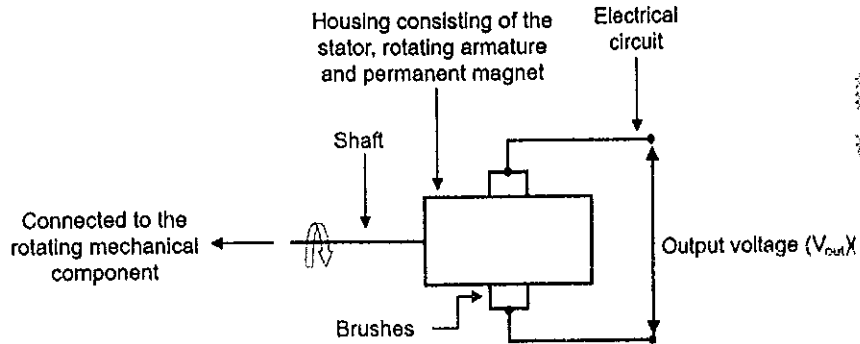1. (a) What is the role of following components in Industrial Automation?   CO- 2 [2.5]
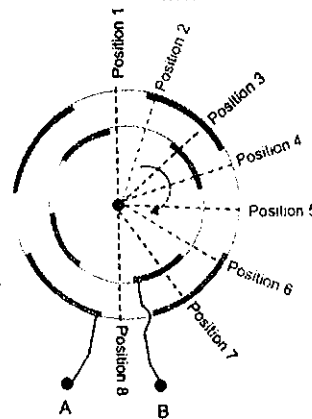

(b) Explain the Complete working of LVDT.   CO- 2 [2.5]

2. (a) How will you use the Stain Gauge in element in the Wheatstone Bridge to measure the stress and strain? CO- 2[2.5]

(b) Explain the working of inductive proximity sensor CO- 2 [2.5]

3. (a) How will you measure the Angular Velocity using DC tacho-generator? CO- 3[2.5]

(b) Draw the output of following quadrature encoder CO- 3[2.5]

4. If you want to apply machine vision in a high precision measurement application, then what are the two most important features for image acquisition? Name two types of illumination systems with one application each. What is F-number? How does the CCD sensor work in a CCD camera at the time of image acquisition? CO- 4 [5]

5. (a) What are the major components required in a machine vision system? CO- 4[2.5]

(b) Name the process zones to be imaged for real-time control of robotic arc welding process. CO- 4[2.5]