Q.P. Code: 50535

03 Hrs **Total marks: 80**

N.B.:--

(1) Question **No.1** is compulsory
(2) Attempt **any three** questions out of remaining **five** questions
(3) Figures to right indicate full marks
(4) Assume suitable data if necessary

Q.1. (A) With a neat sketch explain the architecture of a mechatronic system. (05)
(B) What are different hydraulic pumps used in hydraulic systems? Explain any one in detail (05)
(C) Explain the working principle of Voice coil actuator (05)
(D) Explain the working principle of Comb drives with applications. (05)

Q.2. (A) Explain the central theme of velocity profile optimization of DC motor. (06)
(B) With neat diagrams illustrate the working of Filter-Regulator-Lubricator (FRL) unit in a pneumatic system. (08)
(C) Write constructional features of piezoelectric drives with applications. (06)

Q.3. (A) Write a short note on servo amplifier for DC Motors. (06)
(B)What are the different elements of a CNC machine? Explain in detail. (08)
(C) Explain the concept of "Handshaking". (06)

Q.4. (A) Two double acting pneumatic cylinders A, B are selected for an industrial application. The sequence of movement for piston of the cylinder is as below- A +Delay B+, Delay (AB)- Draw the electro-pneumatic circuit using 5/2 double solenoid as final directional control valves. (12)

(B) Differentiate between serial and parallel data transfer method. (08)

Q.5 (A) Explain the working principle of stepper motor and describe its various type along with its applications. (08)
(B)What is "Polling and Interrupt"? (06)
(C) Differentiate between DAQs and Data Loggers. (06)

Q.6 (A) Design and develop a closed loop mechatronic system to control the vibration of a cantilever beam using active vibration control technique.Also write the features of sensor, actuator, amplifier and controller used. (10)

(B) Describe the possible speed control strategies of A.C. Induction Motors. (05)

(C) Write selection and applications of PLCs. (05)

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