

Total No. of Questions : 8]

SEAT No. :

P5478

[Total No. of Pages : 2

[5669]-545
T.E. (E & TC)
MECHATRONICS
(2015 Pattern) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 70

Instructions to the candidates :

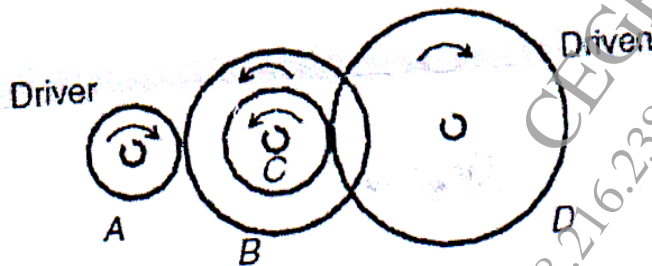
- 1) Answer any one questions out of Q1 or Q2, Q3 or Q4, Q5 or Q6, Q7 or Q8.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right side indicate full marks.
- 4) Assume suitable data if necessary.

Q1) a) A potentiometer which is used to measure the rotational position of a shaft has 850 turns of wire? The input range is from -160 to $+160$. The output range is from 0 to 12V. Determine [6]

- i) span
 - ii) sensitivity in volts per degree
 - iii) average resolution in volts.
- b) Explain the following in details related to Strain Gauge : [8]
- i) Stress & Strain
 - ii) Gauge Factor
 - iii) Output voltage of 4 gauge system
 - iv) Temperature compensation
- c) Explain the Function of an accumulator as shock absorber. Also with neat sketch explain the Dead Weight Accumulator. [6]

OR

Q2) a) For a compound gear train shown in figure, if A, the first driver having 10 teeth, B having 30 teeth, C having 9 teeth and D the final driven wheel having 18 teeth, then determine the overall gear ratio. [4]



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- b) Write Short notes on : [8]
i) Proximity Sensor
ii) Servomechanism
- c) Draw a neat diagram of gear pump. Explain its construction & working principle. [8]
- Q3)** a) Draw & explain basic components of Pneumatic system. [10]
b) Explain chemical dryers with a suitable sketch. [8]
- OR
- Q4)** a) Write short notes on the following : [10]
i) Positive displacement compressor (Piston)
ii) Dynamic displacement compressor (Screw)
- b) Compare hydraulic & pneumatic system in mechatronics application. [8]
- Q5)** a) With the help of a neat sketch, explain the functioning of electromechanical & solid state relays. [8]
b) Explain in detail, working of vane type of pneumatic air motor. [8]
- OR
- Q6)** a) Draw the symbol & explain : [10]
i) Solenoid operated 5/3 direction control valve.
ii) 4/2 sliding spool valve.
- b) Compare single acting & double acting cylinders. [6]
- Q7)** a) Discuss the necessity of High speed tilting Train.
Explain principle of working, a control Schematic & its control using a pendulum. [8]
b) Using suitable block diagram explain working of boat autopilot. [8]
- OR
- Q8)** a) Develop an automatic car parking system. Explain its sequence of operation, advantages & working with suitable sketch. [10]
b) Write a short note on anti-lock braking system technology. [6]

