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

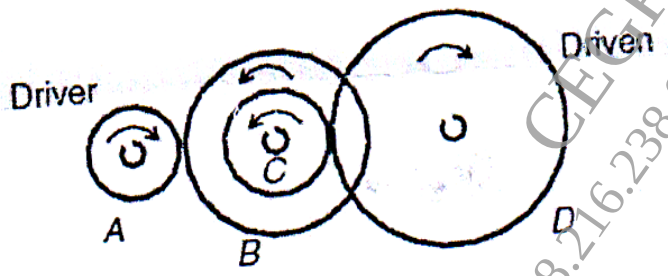
iii) Output voltage of 4 gauge system

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]**



P.T.O.

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]**